

EDINBURGH 2015



ISBNPA

International Society of Behavioral
Nutrition and Physical Activity

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Advancing Behavior Change Science

3rd – 6th June 2015



Abstract Book

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Contents

03	– Committees
03	– Welcome
04	– Thanks
05	– Overview Programme
09	– Keynote Abstracts
12	– Workshop Descriptions
14	– Early career researcher and student invited talks
16	– Symposia S1.1 – S9.7
114	– Oral Sessions OS1.1 – OS1.4
177	– Short-Orals SO1.1 – SO9.4
247	– Posters P0
338	– Posters P1
446	– Posters P2
554	– Posters P3
664	– ISBNPA 2016
664	– ISBNPA 2017
665	– Author Index

Committees / Welcome



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Welcome from Professor Pedro Teixeira, ISBNPA 2015 Scientific Chair

Dear colleague,

Another year, another ISBNPA Meeting – in another fantastic city and venue – and without a doubt another exciting scientific program to explore! From innovative workshops and training opportunities to world leading keynote speakers; from a range of exciting symposia to a record-breaking number of oral communications; from promising invited early-career researchers to various network-driven poster sessions... It may indeed be difficult to choose but I am certain the result will be rewarding, leading to new ideas, deeper collaborations, new (or improved) research initiatives, and greater societal impact. In essence, the fulfillment of ISBNPA's mission.

One note on symposia: there will be many! And several running at the same time (slightly more than usual)... This was a necessary option to ensure high-quality proposals were not rejected, but we have tried our best to avoid duplication of topics being presented simultaneously. Additionally, the fabulous EICC facilities allowed us to place several symposia in contiguous rooms, making it easy to navigate across sessions. We hope you understand the benefits of our decision and are able to successfully cope with an abundance of exciting scientific sessions!

On a more personal side, after more than a decade serving ISBNPA in different roles, I had the great pleasure to chair this year's Scientific Committee, just before leaving the Executive Committee (EC) this month. ISBNPA has had a tremendous impact in my career, and I want to take this opportunity to publicly thank all those who help me along the way in various ISBNPA committees. Indeed, most of them are still engaged with the society, as I hope to be for many years to come. A warm and special thanks to Monique Raats, Hans Brug, and Knut-Inge Klepp, and also to my EC colleagues for the past three years. Finally, cheers to my Scientific Committee colleagues, who responded wonderfully and timely to all requests when building this year's program.

ISBNPA is no longer a small group but we try our earnest to remain personal and friendly, and proudly so. We hope you can feel it! I am confident the Edinburgh local team, with their special Scottish touch, will also leave a lasting mark on all of us.

Enjoy Edinburgh and the Meeting.

Pedro J. Teixeira

Scientific Committee Chair

Thanks

Thanks to the reviewers

The ISBNPA 2015 Abstract Review and Scientific Committees wish to acknowledge the abstract reviewers for the ISBNPA 2015 Annual Meeting.

Their expertise is central to the quality of communications of the meeting.

Thank you for your invaluable contribution to the ISBNPA.

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Overview Programme

Wednesday 3rd June

	Carrick 1	Carrick 2	Carrick 3	Harris 1	Harris 2	Ochil 1	Ochil 2	Tinto	Moorfoot	Kilsyth
08:30 - 12:00		W4: Using technology for community-based advocacy and environmental change: The Community Park Audit Tool App (eCPAT)	W5: Introduction to the methodology of economic evaluation of behavioural and physical activity interventions and risk on bias							
09:00 - 16:00	W1: Five Minutes for Behavior Change: A Strategic Brief Motivational Interviewing Intervention			W3: Developing and evaluating interventions to reduce and break up sedentary time in adults and older adults	W10: Murphy's law and other reasons why things go wrong in intervention studies	W9: ISBNPA Early Career Researcher Workshop		W2: Building a Successful Mobile Health Research Project: Tools, Methods and Trans-Disciplinary Collaborations	W11: Transdisciplinary Research in Energetics and Cancer (TREC) Workshop	W12: How useful are new technologies in dietary assessment and weight management?
12:30 - 16:00		W7: Changing sedentary behaviour in different settings	W8: Developing and Testing Theory-Based Behavioral Interventions: Example from the Colorado Meaning-based Activity Project (Co-MAP)				W6: Behavior Change: Strengthening the Links between Behavioral Science and Policy			

	Pentland Auditorium
16:30 - 17:00	Opening ceremony
17:00 - 18:00	Keynote 1 - Sally Wyke & Kate Hunt: Enhancing the social and cultural relevance of interventions – the interdisciplinary science of behaviour change
18:00 - 19:30	Welcome Reception and Poster Session 0 - Cromdale Hall

Overview Programme

	Pentland	Sidlaw	Fintry	Tinto	Kilsyth	Moorfoot	Carrick	Harris 1	Harris 2	Ochil 1
08:30 - 09:45	S1.1: Physical environment, physical activity and sedentary behaviour – new findings from the 12-country IPEN Adult study		S2.1: Physical activity promotion around the world: How far have we come and what next? Lessons learned	S3.1: Food Pricing and Affordability of 'healthy' versus 'less healthy' diets: an international approach to monitoring and surveillance	S4.1: The gatekeepers to the home: How parenting practices and perceptions affect the dietary intake and physical activity of children.	S5.1: Exploring Early Childhood Food and Activity Environments and their Influence on Children's Energy-Balance Related Behaviours	S6.1: Going Green: Innovative Approaches for Understanding the Value of Parks to Physical Activity and Public Health	S7.1: Measurement and Evaluation of Multi-level Community Based Health Interventions	S8.1: Why we overeat and how experimental psychology can help	S9.1: Promoting Physical Activity and Health through Exergaming in Children
10:00 - 11:00	Keynote 2 - Ulrich Ebner-Premier: Ambulatory Assessment – An innovative method for investigating the dynamics of eating and physical activity									
11:00 - 12:20	Coffee Break (11:00-11:30) Poster Session 1 (11:30-12:20) - Cromdale Hall									
12:30 - 13:00	ECR1: Reframing the measurement of physical activity		ECR2: Who is really in control? Non-conscious regulation of health behaviour	Student: Adolescence to Young Adulthood: Socio-Environmental Influences on Weight-Related Behaviors and Outcomes	S01.1: Physical Activity, Youth, Interventions	S02.1: Food and nutrition environment	S03.1: Physical activity/ Sedentary Behavior, Adults	S04.1: Food security and community nutrition interventions	S05.1: Weight Control, Loss and Maintenance	S06.1: Weight management in pregnancy
13:00 - 14:00	Lunch - Cromdale Hall									
14:00 - 15:00	Keynote 3 - Wendy Demark-Wahnefried: Taking on primary and tertiary cancer prevention simultaneously through family-based interventions: What works and what doesn't?									
15:15 - 16:15	O1.1: Weight control interventions in adults		O2.1: Dietary intervention in families	O3.1: Physical activity and sedentary behavior in toddlers	O4.1: Physical activity, sedentary behavior and health	O5.1: Healthy neighborhoods for adults	O6.1: Socio-economical status and health across the lifespan	O7.1: Measurement of physical activity and sedentary behavior	O8.1: Nutrition and food environment	
16:15 - 16:45	Coffee Break - Cromdale Hall									
16:45 - 18:00	S1.2: DEBATE: High intensity exercise as a public health strategy		S2.2: The effects of web-based computer-tailored interventions targeting health-related behaviours in different population groups	S3.2: Innovative approaches to qualitative research for understanding environmental influences on active living	S4.2: Food literacy: Definitions, components, learning and links to diet and health outcomes	S5.2: Early childhood physical activity intervention research in low- and high-income settings: a case of common threads or glaring differences?	S6.2: Engaging fathers in childhood obesity research and prevention: Current status, recommendations and future opportunities	S7.2: From GIS and GPS measures towards instruments for urban planning and policy making	S8.2: Reward sensitivity and self-regulation strategies: a new scope for health promotion?	S9.2: Audit and evaluation of physical activity policy: An examination of developments within the food environment
18:15 - 19:15	SIG1 - Socioeconomic inequalities		SIG2 - e- & mHealth	SIG3 - Motivational Dynamics	SIG4 - Policies and Environments	SIG5 - Children and Families	SIG6 - Early Care and Education			SIG7 - Cancer Prevention and Management

Overview Programme

	Pentland	Sidlaw	Fintry	Tinto	Kilsyth	Moorfoot	Carrick	Harris 1	Harris 2	Ochil 1
08:30 - 09:45	S1.3: Determinants of sedentary behaviour across the life span: a DEDIPAC symposium		S2.3: Walking to physical and mental health: latest evidence and next steps for action	S3.3: Evaluating the impact of changes to the food environment on diet or health outcomes	S4.3: Lessons learned - diet and PA interventions in pregnancy and the postpartum.	S5.3: Opportunities and challenges with dietary patterns in behavioral nutrition	S6.3: Physical activity to promote positive mental health	S7.3: School environments, physical activity and sedentary behaviour in youth	S8.3: Target 2025: Innovation and advocacy on salt reduction	S9.3: Diet and Physical Activity Interventions for Cancer Survivors
10:00 - 11:00	Keynote 4 - Martin Hagger: An Integrated Behavior-Change Model for Physical Activity									
11:00 - 12:20	Coffee Break (11:00-11:30) Poster Session 1 (11:30-12:20) - Cromdale Hall									
12:30 - 13:00	SO1.2: Physical activity theory and correlates		SO2.2: Prevention and community interventions in adults	SO3.2: Nutrition and eating behavior over the lifespan	SO4.2: Active transportation	SO5.2: Physical activity correlates in children	SO6.2: Physical activity and sedentary behavior in older adults	SO7.2: Food environment and health claims	SO8.2: Trends and correlates of sedentary behavior	SO9.2: Obesity prevention and weight control
13:00 - 14:00	Lunch - Cromdale Hall									
14:00 - 15:00	Keynote 5 - Kylie Ball: Traversing myths and mountains: Addressing socioeconomic inequalities in the promotion of nutrition and physical activity behaviours									
15:15 - 16:30	S1.4: Children's Active Transport And Independent Mobility – An International Perspective		S2.4: Serious digital games and gamified applications to improve children's healthy diet and physical activity	S3.4: Exploring the behavioural and health impacts of children's energy-dense food marketing exposure	O1.2: Environment and physical activity and sedentary behavior in youth	O2.2: Food policy, environment and marketing	O3.2: Behavior change theory	O4.2: Nutrition and physical activity interventions	O5.2: Food and nutrition in adolescents	O6.2: Nutrition and physical activity epidemiology
16:30 - 17:00	Coffee Break - Cromdale Hall									
17:00 - 18:15	S1.5: DEBATE: A Tale of Two Dietary Methodology Perspectives		S2.5: Environmental interventions to increase physical activity in youth	S3.5: Restructuring the classroom environment to reduce sedentary behaviour	S4.5: Cooking and skills interventions	S5.5: Utilizing social networks for physical activity and dietary behavior change	S6.5: Taking the next step: Translating evidence-based interventions into real world settings	S7.5: Routines and Disruptions: How Changing Daily Life Shapes Child and Family Eating and Feeding	S8.5: Transport behavior in adolescents and young adults: findings from Belgium, Spain and Nigeria	S9.5: Physical activity and sedentary behavior among older adults: the role of the perceived and objective physical environment
Evening	Gala Dinner and Ceilidh at Our Dynamic Earth									

Overview Programme

	Pentland	Sidlaw	Finty	Tinto	Kilsyth	Moorfoot	Carrick	Harris 1	Harris 2	Ochil 1
08:30 - 09:45	S1.6: Determinants of Diet and Physical Activity (DEDIPAC)	S2.6: Assessing dietary intake: Closing gaps between what we know and what we do	S3.6: Promoting healthy eating and physical activity during out-of-school time	S4.6: Going beyond the outcome data: process evaluations of interventions in physical activity and sedentary behaviour	S5.6: Fiscal food policies for public health and climate change	S6.6: The latest evidence on children's sedentary behavior measurement – validity, differentiation and health effects	S7.6: Dimensions of nutrition knowledge and its impact on food intake	S8.6: Behaviour change interventions for adults with intellectual disabilities		S01.3: Research methods in nutrition
10:00 - 11:00	O1.3: Physical activity and sedentary behavior interventions in adults	O2.3: Technology in physical activity and sedentary behavior research	O3.3: Obesity prevention in children	O4.3: Physical activity environment in adults	O5.3: Determinants of physical activity and sedentary behavior	O6.3: Food and nutrition environment	O7.3: Active transport and infrastructures in adults	O8.3: Eating behavior and weight management		O9.3: Nutrition in schools and children
11:00 - 11:30	Coffee Break and Poster Session 3 - Cromdale Hall									
11:30 - 12:45	S1.7: Obesogenicity of social and physical environments across Europe – findings from the SPOTLIGHT project	S2.7: Measuring sedentary behavior across the lifespan: issues of subjective and objective instruments	S3.7: Evaluating The Travel And Physical Activity Impacts Of Transport Infrastructure Projects	S4.7: Advances and issues in measuring parenting related to children's nutrition and physical activity behaviors	S5.7: International Children's Accelerometry Database (ICAD): overview, ongoing work and future directions	S6.7: Mapping the determinants of dietary behaviour and physical activity/ sedentary behaviour in minority ethnic groups- a DEDIPAC study	S7.7: Innovative methodologies to study environment- health behavior relationships	S8.7: Interventions to Increase Physical Activity Through Dog Walking: International Evidence	O1.4: Physical activity and sedentary behavior in children	S9.7: Gestational weight gain and obesity: What do women want, what do health professionals think and what interventions are practical?
12:45 - 14:00	Lunch and Poster Session 3 - Cromdale Hall									
14:00 - 15:10	S01.4: Nutrition and social and built environment		S02.4: Physical activity and the built environment	S03.4: Physical activity in children	S04.4: Physical activity interventions in adults	S05.4: School-based interventions in children and adolescents	S06.4: Diet and nutrition in children and adolescents	S07.4: Healthy eating at school and at home	S08.4: Measurement of physical activity and sedentary behavior	S09.4: Physical activity, sedentary behavior and health
15:15 - 16:15	Keynote 6 - Kelly Brownell: Harnessing Our Work to Create Social and Policy Change in Nutrition and Obesity									
16:15 - 16:45	Closing ceremony									

Keynote Abstracts

K1

Wednesday, 3rd June, 1700-1800

Enhancing the social and cultural relevance of interventions – the interdisciplinary science of behaviour change

Sally Wyke, Kate Hunt
University of Glasgow, UK

SIG: Yes, Socioeconomic inequalities

The evidence and theory supporting innovation in behaviour change interventions are building at an exciting pace but the scale of the international public health challenge remains enormous. Substantial progress has been made in unpicking the mechanisms of action of behavioural change at an individual level and in applying effective behaviour change techniques to successful programme development. However, to add to upstream interventions and to achieve real public health gain, our programmes require much greater reach and even more effective ways of initially engaging people and then in supporting them in maintaining behavioural change. The ultimate aim is for the behaviours, or practices, that are learnt and applied to become 'the new normal' and for effective interventions to be available, accessible and attractive to even the most 'hard-to-reach' so that health improvement effort reduces rather than increases social inequalities in health.

In this presentation we argue that if, in intervention development and research, we pay even more attention to the essentially social nature of health-related behaviours, and if we recognise and work with the cultural context within which health and other behaviours are enacted and reformulated over time, we can improve both the reach and effectiveness of our programmes. In essence, we argue for greater integration of what Wright-Mills called the 'sociological imagination' into programme development.

To make this case we draw, amongst other evidence, on our experience of developing and evaluating the 'Fans in Training' set of programmes, the first of which is the highly successful, award-winning, Football Fans in Training (FFIT) programme. FFIT is gender-sensitised in relation to context (the traditionally male environment of football clubs and men only groups), content (information about the science of weight loss presented simply, discussion of alcohol and its potential role in weight management, and branding with club insignia), and style of delivery (participative with time devoted to interaction amongst participants for vicarious learning and mutual support). This, and subsequent programmes are developing, are explicitly designed to work with rather than against existing cultural identities in attracting and engaging participants in change and, through multiple opportunities for interaction, to support long-term change and the negotiation of new, more 'healthful' identities.

We conclude that a more interdisciplinary approach to the development and delivery of health improvement programmes can both enhance their reach and effectiveness and potentially contribute to wider scale cultural change at a societal level.

K2

Thursday, 4th June, 1000-1100

Ambulatory Assessment – An innovative method for investigating the dynamics of eating and physical activity

Ulrich Ebner-Priemer
Karlsruhe Institute of Technology, Germany

SIG: Yes, Policies and environments; and e- & mHealth

The term "Ambulatory Assessment" encompasses a wide range of methods used to study people in their natural environment, including momentary self-report, observational, and physiological methods. I will illustrate four major advantages of this approach: (a) Real-time assessments increase accuracy and minimize retrospective bias; (b) assessments in real-life situations enhance generalizability; (c) repeated measurements allow tracing of dynamic processes; and (d) multimodal assessments integrate psychological, physiological, and behavioural data. Examples from eating and physical activity will help demonstrating challenges and promises of Ambulatory Assessment. In addition, I will outline innovative strategies, like activity-triggered e-diaries or experimental manipulation in everyday life. To conclude, I will briefly discuss reactivity, generalizability and privacy issues.

K3

Thursday, 4th June, 1400-1500

Taking on primary and tertiary cancer prevention simultaneously through family-based interventions: What works and what doesn't?

Wendy Demark-Wahnefried
University of Alabama at Birmingham, USA

SIG: Yes, Cancer Prevention and Management

A cancer diagnosis is a life altering event that exerts tremendous impact on the patient, as well as their friends and family members. Given its gravity and potential for enhancing engagement, it is postulated that the cancer diagnosis serves as a "teachable moment," and one that could be capitalized upon to promote healthy lifestyle practices in terms of both primary (promotion of health in non-affected friends and family members) and tertiary for prevention (health promotion for the cancer survivor). This presentation focuses on two feasibility trials that were aimed at promoting improvements in diet and exercise behaviors among cancer survivors and their family members: DAMES: Daughters And MothErS against breast cancer (a year-long randomized controlled trial [RCT] of 68 mother-daughter dyads in which the mother had a diagnosis of early stage breast cancer and both dyad members were overweight or obese and inactive); and Healthy Moves (a 6-month RCT of 22 survivor-spouse dyads in which the survivor had a diagnosis of early stage breast, prostate or colorectal cancer and both dyad members were inactive and/or ate fewer than the recommended servings of fruits and vegetables). Both interventions included tailored mailed print materials and cues to action, such as pedometers, portion plates, and log books; Healthy Moves also included nine counseling sessions delivered via webcam. Three percent of breast cancer survivors contacted for DAMES enrolled in the trial, whereas uptake was 15% for the spouse-based intervention. Retention was greater than 90%

KEYNOTE ABSTRACTS

for both trials and no serious adverse events were reported for either of the home-based interventions. While neither trial was adequately powered to detect significant differences between intervention and control arms, significant improvements in body mass index (BMI) waist circumference, caloric intake, minutes of physical activity and/or fitness levels were observed among the mother-daughter dyads who participated in DAMES. Similarly, among couples participating in Healthy Moves significant improvements in BMI, physical activity and fruit and vegetable intakes were observed. Satisfaction also was high for both interventions. Therefore, partner-based interventions hold great promise for improving the lifestyle behaviors and health indices among cancer survivors and their family members, though more research is needed to determine the optimal composition of the participant team and to fine-tune the design and intervention components.

K4

Friday, 5th June, 1000-1100

An Integrated Behaviour-Change Model for Physical Activity

Martin S. Hagger
*Health Psychology and Behavioural Medicine Research Group,
Curtin University, Perth Australia*

SIG: Yes, Motivational Dynamics

I present an integrated behaviour-change model for physical activity (Hagger & Chatzisarantis, 2014); a comprehensive multi-theory model outlining the psychological factors and processes that impact change in health-related physical activity behaviour. The model integrates hypotheses and processes stipulated in social-cognitive, motivational, dual-phase, and dual-systems theories of motivation. I will provide the conceptual and empirical bases of the model and demonstrate its utility in driving future research and developing effective interventions to promote physical activity. The model incorporates three basic processes: motivational, volitional, and implicit, and incorporates them into a single model to predict behaviour. The motivational process has its origins in theories that focus on the organismic and social cognitive factors involved in the development of motives and intentions to engage in health behaviour. These motivational theories have considerable empirical support in predicting behaviour, although their effectiveness in predicting behaviour change is more open to question. The volitional process originates from dual-phase models of action in which behavioural engagement is dependent on processes that enable motivated or intended actions to be fulfilled. The volitional components predominantly comprise planning factors, such as action plans or implementation intentions, which focus on the intention enactment and prevent derailment through failure to convert intentions into behaviour. The implicit process comprises psychological factors that affect behaviour beyond an individual's awareness or with little cognitive or deliberative input. This process is in contrast to the motivational and, to some extent, volitional processes which tend to rely heavily on reflection and deliberation over courses of action. Relatively recent advances in measurement have given rise to studies examining the implicit factors that predict physical activity beyond conscious awareness. I will outline recent empirical research that incorporates at least two of these processes to arrive at more comprehensive explanations of health behaviour change and propose that the integrated change model that incorporates all three processes advances thinking of the complex factors and

processes that determine change in activity behaviour. I will argue that the model is a specific exemplar of a generalized 'tri-process' framework (Hamilton & Hagger, 2015) applicable to multiple health behaviour contexts.

K5

Friday, 5th June, 1400-1500

Traversing myths and mountains: Addressing socioeconomic inequalities in the promotion of nutrition and physical activity behaviours.

Kylie Ball
Deakin University, Australia

SIG: Yes, Socioeconomic inequalities

In developed countries, individuals experiencing socioeconomic disadvantage – whether a low education level, low income, low-status occupation, or living in a socioeconomically disadvantaged neighbourhood – are less likely than their more advantaged peers to engage in eating and physical activity behaviours conducive to optimal health. These socioeconomic inequalities in nutrition and physical activity behaviours are graded, persistent, and evident across multiple contexts. They are concerning in that they mirror socioeconomic inequalities in health outcomes, and point to likely behavioural mediators. Yet there remains a dearth of evidence of the most effective means of addressing these inequalities in order to promote nutrition and physical activity behaviours equitably across populations. With increasing recognition of the role of broad underlying structural and societal factors as determinants of nutrition and physical activity behaviours and inequalities in these behaviours, and the limited success of behaviour change approaches in addressing these inequalities to date, we might wonder whether there remains a role (or a hope!) for behavioural scientists to tackle these challenges. This presentation will argue that: 1) there does, that 2) this may involve challenging myths and misconceptions, giving up some 'established wisdom' and taking on new perspectives, and that 3) there are successful models for doing so from which we can learn, including nationwide walking group programs, food-skills based initiatives and tailored workplace-based interventions, key elements of which will be described.

K6

Saturday, 6th June, 1515-1615

Harnessing Our Work to Create Social and Policy Change

Kelly D. Brownell

Dean, Sanford School of Public Policy

Robert L. Flowers

Professor of Public Policy

Professor of Psychology and Neuroscience, Duke University, USA

SIG: Yes, Policies and environments

Whether we teach, create scholarship, mentor students, or do a combination of these, a final path for maximizing change can be changing social norms and informing public policy in ways that affect lives millions at a time. Linking work in academic settings to public policy is generally not something we are trained to do, reinforced for undertaking, or given the resources to support. Researchers should not assume their work is relevant in the policy world or believe the best solution to the disconnect between research and policy is to more effectively “push out” information to the policy world.

This talk will present a model of “strategic science” meant to magnify the impact of research on policy. The model begins with creating a two-way flow of information between researchers and the people or institutions in a position to make change. Depending on the change needed, these change agents could be legislators, regulators, legal authorities, the press, NGOs, etc. This reciprocal flow of information can then inform the questions researchers address. The information derived from scholarship must then be communicated to change agents in effective and timely ways in order to narrow the gap between the slow pace of science and publishing and the fast-paced world of policy.

Examples will be used from public health, diet and nutrition in particular, to demonstrate how impact can be woven into the work we do. Significant victories have been achieved by connecting science with policy, but far fewer than possible. Use of a model for better linking science with policy could be helpful in advancing public health.

Workshop Descriptions

June 3, Morning

Using technology for community-based advocacy and environmental change: The Community Park Audit Tool App (eCPAT)

Gina Besenyi (*Un. South Carolina*), Andrew T. Kaczynski (*Un. South Carolina*), Jenny Veitch (*Deakin University*), Sonja A. Wilhelm Stanis (*Un. Missouri*)

The overall goal of this workshop is to describe the importance of, and strategies for, engaging community members, especially youth, in building healthy communities. Given the increasing use of smartphones and other electronic devices, especially among adolescents, leveraging this growth in technology to engage the broader public in evaluating and advocating for healthy community design is imperative.

To highlight this process, this workshop will describe and demonstrate the electronic Community Park Audit Tool (eCPAT app) and its utility for active living health promotion interventions. Specifically, the aims of this workshop are:

- 1) To describe the importance of civic engagement and advocacy and the role of technology in fostering healthy community design.
- 2) To introduce participants to park audits and the electronic Community Park Audit Tool (eCPAT) app.
- 3) To collectively discuss how mobile technology and other electronic tools can be used by researchers and public health professionals for community-based advocacy and environmental change.

Through a visit to a local park, participants will have the opportunity to interact with the eCPAT app and to learn about its utility for both research and community health promotion.

Introduction to the methodology of economic evaluation of behavioural nutrition and physical activity interventions and risk on bias.

Marieke Hendriks (*Maastricht University*), Silvia MAA Evers (*Trimbos Institute & Maastricht University*)

The problem of increasing health expenditures throughout the world has been a focus of the public debate for years. In order to allocate scarce resources more effectively scientific information is needed in which both costs and effects of an intervention are evaluated, preferably at a societal level. Economic evaluation is a technique that is developed to assess costs and benefits of alternative health strategies to provide a framework for decision-makers.

The aim of this workshop is to give an introduction of the theoretical concepts of economic evaluations with the focus on interventions in the area of behavioural nutrition and physical activity. In this workshop the necessity of performing economic evaluation will be discussed, the methods of performing economic evaluation will be lectured, including the limitations and the risk of bias in economic evaluations. After the introductory lectures participants will apply their new knowledge about economic evaluation on a case study in small working groups.

Behavior Change: Strengthening the Links between Behavioral Science and Policy

Dawn K. Wilson (*Un. South Carolina*); Susan Michie (*Un. College London*); & Pedro J. Teixeira (*Un. Lisbon*)

This workshop will provide an overview of the links between behavioral science and policy. Professor Michie will present frameworks that are grounded in evidence and theory and which are useful for policy-makers and will demonstrate effective ways of bringing science and policy closer together. She will specifically present two examples of policy inspired science: the Behaviour Change Wheel and Taxonomies of Behavior Change Techniques, illustrated by physical activity and dietary-related examples. Professor Wilson will lead the second session on the importance of cost comparisons and savings to society and translation of effective interventions into community settings. She will discuss the translation of behavioral interventions using the Interactive Systems Framework and will provide examples using physical activity and dietary interventions. Professor Teixeira, the Immediate Past-President of ISBNPA, will lead the third session addressing challenges of promoting evidence-based policies. He will guide a discussion on the role of scientific societies regarding implementing an evidence-based policy agenda.

See a youtube advertisement about this workshop (<https://www.youtube.com/watch?v=RjCm8y4rskM>)

June 3, Afternoon

Changing sedentary behaviour in different settings

Stuart Biddle (*Victoria University, Australia*), Trish Gorely (*University of Stirling, UK*), & Stacy Clemes (*Loughborough University, UK*)

It is important to understand behaviour change across different settings. There are sedentary behaviour studies emerging where prolonged periods of sitting are targeted for children in the school setting, although efficacy and effectiveness have yet to be systematically reported on.

For adults, the workplace provides a setting for prolonged periods of sitting, often in front of a screen. Such interventions have reported meaningful changes in sitting. However, many other issues remain unresolved, including effects on productivity and the acceptability of such changes by employees and employers. Finally, the most ubiquitous setting for sedentary behaviour is in the home, with both adults and young people engaging in large amounts of sitting, often in front of screens for entertainment and social networking. Fewer studies have targeted families. The home environment provides a particularly challenging environment for reductions in sedentary behaviour.

This workshop, therefore, will consider intervention possibilities across the three settings of schools, workplaces and homes. Experience will be shared from projects and the wider literature and practical suggestions explored by participants and, through the workshop facilitators, take-home action points will be produced.

WORKSHOP DESCRIPTIONS

Developing and Testing Theory-Based Behavioral Interventions: Example from the Colorado Meaning-based Activity Project (Co-MAP)

Kevin S. Masters, Stephanie A. Hooker, & Jennalee S. Wooldridge
(all from *Un. Colorado Denver*)

Are you interested in designing an innovative and theory-based intervention for behavior change? This workshop will provide hands-on training in intervention development. Participants will be able to (1) describe stages of developing theory-based interventions; and (2) apply those stages to their area of research or interest. Come learn about theory-based intervention development as we share our recent experiences developing a Self Determination Theory-based intervention that connects individuals' life meaning and purpose to physical activity engagement through interview and e-health applications. The workshop will feature an interactive format including small group discussions, group activities, brainstorming sessions, and completion of a comprehensive workbook on theory-based intervention development.

June 3, All day

Five Minutes for Behavior Change: A Strategic Brief Motivational Interviewing Intervention

Kelli L. Drenner (*Stephen F. Austin State University*)

What if you only had five minutes to talk with a client about lifestyle change? Motivational interviewing has been found to be effective in brief sessions for a variety of health behaviors. This workshop will highlight major advances in our understanding of MI and incorporates the four-process model (engaging, focusing, evoking and planning) introduced by Miller and Rollnick (2013) in the 3rd edition of *Motivational Interviewing: Helping People Change*. Participants can expect a didactic and experiential workshop that introduces the audience to the underlying spirit and method of motivational interviewing. Role-playing exercises aimed at practicing the key skill of reflective listening will be emphasized. Understanding the significance of change talk and tools for eliciting the client's desire, ability, reason and need for change will also be discussed. The workshop will culminate in a potential framework for a brief, 5-minute intervention that develops a clear behavioral focus, enhances motivation and moves the client toward setting an achievable goal.

Building a Successful Mobile Health Research Project: Tools, Methods and Trans-Disciplinary Collaborations

Heather Patrick (*Live Healthier*); Melanie Hingle (*Un. Arizona*)

Advances in and proliferation of mobile and wireless (mHealth) technologies have created opportunities for nutrition and physical activity researchers to extend the reach of behavioral interventions and collect unprecedented data in real time. However, challenges remain in how best to leverage these technologies to advance behavioral science and maximize public health gain. The purpose of this workshop is to provide a primer on mHealth research within the context of diet and physical activity interventions for behavior change and maintenance. Guided by international leaders in engineering, medicine, and behavioral nutrition and physical activity, attendees will work in teams to select appropriate mHealth technologies and methods, and integrate them with diet and physical activity assessment and/or intervention within a common case study.

After completing the workshop, attendees will be able to:

- Design mHealth research questions to advance behavioral nutrition and physical activity science
- Identify critical skills and expertise needed for a successful mHealth project
- Choose appropriate mHealth tools and methods to: a) collect and analyze behavioral data; and b) facilitate diet and/or physical activity behavior change

Developing and evaluating interventions to reduce and break up sedentary time in adults and older adults

Paul Gardiner (*Un, Queensland*); Claire Fitzsimons

(*Un. Edinburgh*); Jo Salmon (*Deakin University*);
Nanette Mutrie (*Un. Edinburgh*); Graham Baker
(*University of Edinburgh*)

Although sedentary time outcomes following physical activity interventions have been reported over the past ten years, the first intervention directly targeting sedentary time in adults was only reported in 2009. Due to the nascent field of research, it is timely to consider the best way to progress the development and evaluation of interventions to reduce and break up prolonged sitting in adults and older adults.

During this didactic and interactive workshop participants will consider:

- a. how sedentary behaviour interventions interact with interventions targeting other behaviours
- b. appropriate research methodologies for evaluating interventions
- c. the importance of Behaviour Change Techniques (BCTs) and accurate reporting of intervention elements
- d. evidence based BCTs for interventions
- e. the advantages and disadvantages of subjective and objective measures of sedentary time
- f. measurement of intervention effects to include consideration of total sedentary time and accumulation patterns
- g. issues associated with scaling up interventions for real-world uptake

ISBNPA Early Career Researcher Workshop

Kylie Ball, Erica Hinckson, Mette Rasmussen, Ilse de Bourdeaudhuij, Charlie Foster, David Crawford, Mai Chin-A-Paw, Deanna Hoeschler, Tom Baranowski and others.

The Early Career Researchers workshop will give you an opportunity to learn from experienced researchers on a range of topics such as: career guidance, developing collaborations, grant-writing tips, mentoring, time management and building your CV. The workshops will offer several opportunities for networking with other participants and senior researchers, including round-table discussions. Sessions will include both lecture-style, information sharing and small group discussions. Numbers will be limited so register early!

ECR AND STUDENT INVITED TALKS

Murphy's law and other reasons why things go wrong in intervention studies

Stef Kraemer, Kathelijne Bessems, Rik Crutzen, Sanne Gerards, Jessica Gubbels, Geert Rutten & Dave Van Kann
(all from Maastricht University)

The literature reveals many study protocols and effect evaluations of interventions promoting healthy energy balance-related behaviors. However, general challenges, failures and mistakes in developing and studying these interventions are less frequently reported or they are downplayed in publications. As a result, intervention developers and researchers often set too ambitious goals, face similar challenges, and finally find comparable solutions after an extensive process of learning by trial and error. This workshop focuses on challenges at the various stages of intervention studies in an open atmosphere that facilitates sharing of failures and mistakes; from intervention development to implementation and evaluation. We focus on 1) providing insight into essential steps of the systematic development, implementation and evaluation of interventions 2) providing insight into common challenges during these phases, and 3) sharing experiences with and proposing solutions for dealing with these challenges. The workshop will be led by a team experienced in intervention development and research, using a range of interventions as examples.

Transdisciplinary Research in Energetics and Cancer (TREC) Workshop

Melinda Irwin (Un. Yale); Jennifer Ligibel (Dana Farber Cancer Institute); Kathryn Schmitz (Un Pennsylvania)

The primary aim of this transdisciplinary research in energetics and cancer (TREC) workshop is to offer an 8-hour energetics (i.e., physical activity, diet and obesity) and cancer course for postdoctoral students or junior faculty with the long-term goal of increasing the number of researchers who have expertise in energetics and cancer, and enhancing the ability of course participants to pursue successful careers in energetics and cancer. To our knowledge, no training or educational course on energetics and cancer exists. The course will build upon the TREC Consortium by enhancing the training and educating of scientists to carry out transdisciplinary research focused on energetics and cancer. The long-term goals of this course will also assist in accelerating progress towards understanding the etiology of energetics and cancer by training the next generation of energetics and cancer leaders. Training new leaders will also assist in dissemination and implementation of effective strategies for cancer prevention and control, as they will carry out the translational research to lower the risk, mortality, morbidity and costs associated with cancer.

How useful are new technologies in dietary assessment and weight management?

Victoria Burley & Janet Cade (Un. Leeds)

Are you interested in finding out more about the use of new technologies in dietary assessment or in the weight management arena? How useful are current tools? Are they accurate and valid, and what steps might you need to consider in their development? In this workshop, a variety of international experts will make presentations concerning these questions, and early career researchers will present some of the very latest findings in the field. Panel discussion of these issues will also lead to the development of guidelines around best practice for the use of new technologies in dietary assessment and weight management.

Early career researcher and student invited talks

ECR1

Paul Kelly

Chair: **Nanette Mutrie**

Physical Activity for Health Research Centre (PAHRC), Institute for Sport, Physical Education and Health Sciences, University of Edinburgh

The ability to measure physical activity is quite important to researchers and practitioners. Some would argue this is an understatement. In response we have sought to understand the error in our measurements, and develop methods with less inherent error, bias or uncertainty. I will argue that as a field, we have created more confusion than coherence.

In my PhD I investigated the validity and reliability of self-reported travel behaviour, specifically walking and cycling (1). I will show that the results were not as expected, and contrasted findings from our systematic review of self-reported travel against GPS measured travel (2).

Through these investigations I proposed a framework for understanding the measurement properties of different methods that was specific to understanding physical activity behaviours such as walking and cycling (3). I will discuss the extent to which this framework can help us to understand the appropriate assessment of measurement properties for contrasting designs such as longitudinal cohorts or short term intervention evaluations. Finally, I will show how we have used wearable cameras to address some of these challenges, and move our understanding of physical activity measurement forward (4-6).

1. Kelly P, Doherty A, Mizdrak A, Marshall S, Kerr J, Legge A, et al. High group level validity but high random error of a self-report travel diary, as assessed by wearable cameras. *Journal of Transport & Health*. 2014;1(3):190-201.
2. Kelly P, Krenn P, Titze S, Stopher P, Foster C. Quantifying the Difference Between Self-Reported and Global Positioning Systems-Measured Journey Durations: A Systematic Review. *Transport Reviews*. 2013;33(4):443-59.
3. Kelly P. Assessing the utility of wearable cameras in the measurement of walking and cycling: University of Oxford; 2013.
4. Kelly P, Doherty A, Berry E, Hodges S, Batterham AM, Foster C. Can we use digital life-log images to investigate active and sedentary travel behaviour? Results from a pilot study. *Int J Behav Nutr Phys*. 2011;8.
5. Kelly P, Doherty AR, Hamilton A, Matthews A, Batterham AM, Nelson M, et al. Evaluating the Feasibility of Measuring Travel to School Using a Wearable Camera. *American Journal of Preventive Medicine*. 2012;43(5):546-50.
6. Kelly P, Marshall SJ, Badland H, Kerr J, Oliver M, Doherty AR, et al. An Ethical Framework for Automated, Wearable Cameras in Health Behavior Research. *American Journal of Preventive Medicine*. 2013;44(3):314-9.

ECR2

Amanda L Rebar

Chair: Corneel Vandelanotte

Central Queensland University; School of Human, Health, and Social Sciences; Physical Activity Research Group

Most people would like to believe that they are in control of their behaviour, especially when it comes to actions that impact health. Much of the research on physical activity and nutritional behaviour has taken the perspective that motivation to be active or eat healthy is an intentional process and that changing people's behaviour requires changing their expectancies, values, and attitudes. However, evidence from neuroscience and psychology reveals that only a modest proportion of behaviour is based on these deliberative processes. Behaviour is also dictated by non-conscious processes including behavioural impulses from mental associations between certain cues to behaviours (i.e., habits) or between certain behaviours and (un)pleasant feelings (i.e., automatic evaluations).

The idea that behaviour is regulated by conscious and non-conscious processes has been around for over a century, but these 'dual process theories' have had minimal impact on the study of physical activity and nutrition until recently. New advancements in conceptualization and measurement have made the non-conscious side of regulation more salient and accessible to health researchers. My presentation will focus on the non-conscious regulatory processes of habits and automatic evaluations and their influence on physical activity.

I will present findings from our recent systematic review of studies testing the direct link of habit and automatic evaluations with physical activity as well as how the regulation of these processes interacts with conscious regulation (e.g., intentions) to impact behaviour. I will also provide a practical view of the conceptualization and measurement of habit and automatic evaluations so health researchers can incorporate these non-conscious regulatory processes in their own work.

Marketers and advertisers are masters at manipulating non-conscious consumer behaviour through repeatedly filling our environment with pairings of products with fun or sex-appealing images. Political campaigns shape public impressions of candidates through constant repetitions of the names of their political opponents paired with negative descriptors. As our understanding of the non-conscious aspects of health behaviour regulation grows, so too will the potential to utilize these processes as mechanisms for promoting healthy behaviours.

Student

Allison Watts

Chair: Dianne Neumark-Sztainer

**Division of Epidemiology and Community Health,
School of Public Health
University of Minnesota**

Adolescence and young adulthood are critical yet understudied time periods in the development of weight-related behaviors and obesity. A growing body of evidence suggests that characteristics of the home food environment such as family meals, parenting practices, and food availability contribute to adolescent body weight. Broader environments such as the influence of peers and characteristics of schools, workplaces, and communities may also shape weight-related behaviors and outcomes.

Therefore, achieving healthier weight-related behaviors and outcomes may be particularly difficult without consideration of the socio-environment in which behavioral choices are made. How individuals experience their socio-environment likely differs across the life course and may be experienced differently for overweight and non-overweight individuals. This talk will focus on the socio-environmental context of obesity during the transitional periods of adolescence and young adulthood and how the unique experiences of adolescents with obesity and who are at-risk for obesity might provide insight on how to better shape environments that support healthy eating. Findings from two studies will be presented. First, a modified photovoice study was conducted to explore the perceptions and experiences of adolescents seeking obesity treatment on how families, peers, schools and communities influence their food choices. Second, 10-year follow-up data from a population-based cohort of adolescents (Project EAT: Eating and Activity Among Teens) were used to explore the personal, psychological, behavioral and socio-environmental context of overweight and obesity in adolescence and to identify factors that predict moving to a more favorable weight status (exiting overweight or obesity) in young adulthood. The results of these studies have implications for improving current approaches for promoting healthy eating and addressing obesity in young people. The role of policy-driven environmental changes for supporting weight-related behaviors in adolescents and young adults will also be discussed.

S1.1 SYMPOSIUM:

Physical environment, physical activity and sedentary behaviour – new findings from the 12-country IPEN Adult study

Chair: Ester Cerin, Deakin University, Burwood, Victoria, Australia

S1.1.1

Do associations of gender, age and education with transport and leisure-time physical activity differ across countries? Findings from the IPEN Adult study

Rodrigo Reis¹, Ester Cerin^{2,3}, Olga Sarmiento⁴, Adriano Hino¹, Pablo Lemoine⁴, Adewale Oyeyemi⁵, James Sallis⁶
¹Pontificia Universidade Catolica do Parana, Curitiba, Brazil,
²Deakin University, Burwood, Victoria, Australia, ³The University of Hong Kong, Hong Kong, China, ⁴Universidad de los Andes, Bogota, Colombia, ⁵University of Maiduguri, Maiduguri, Nigeria, ⁶University of California, San Diego, San Diego, USA

SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Although associations of age, educational attainment and gender with physical activity (PA) outcomes have been found to be fairly consistent, the vast majority of studies has not examined these associations with leisure and transport PA across different countries. This study examined associations of leisure and transportation PA with socio-demographic characteristics in multiple countries and whether these differ by country.

Methods: The IPEN adult study is an observational multi-country cross-sectional study. The current analysis included data of 17 cities in 12 countries (N=13,250 adults). The International Physical Activity Questionnaire (IPAQ-long) was used to assess participants' self-reported PA. This study had four binary (no vs. yes) and two continuous PA outcomes (non-zero weekly minutes of transport and leisure-time PA). Generalized additive mixed models were used to assess associations.

Results: Age was significantly associated with all PA outcomes with the exception of engaging in ≥ 150 min/wk of transport PA. The shape of the associations varied through the outcomes and was non-linear for the odds of engaging in ≥ 10 and ≥ 150 min/wk of leisure-time PA and non-zero weekly minutes of leisure-time PA. Overall, educational attainment was positively related to the odds of engaging in ≥ 10 and ≥ 150 min/wk of leisure-time PA but unrelated to non-zero weekly minutes of the same type of activity; and negatively related to non-zero weekly minutes of transport PA. Gender showed a significant association with all PA outcomes with the exception of engagement in ≥ 10 min/wk of transport PA. City moderated the associations of age with four out of six PA outcomes; and of educational attainment with non-zero minutes of leisure-time PA only. Additionally, city moderated the associations of gender with three PA outcomes.

Conclusions: Linear and non-linear associations of age, gender and education with leisure and transportation PA were found. Overall, the associations were somewhat inconsistent across PA outcomes and study sites. International studies are needed to further understand the patterns of PA across different cultures and societies. Future studies should focus on the role of site specific characteristics in explaining variations in adults' PA levels.

S1.1.2

Moderating effects of age, gender and education on the relationships between perceived built environment attributes and accelerometer-based physical activity: the IPEN Adult study

Delfien Van Dyck¹, Ester Cerin^{2,3}, Ilse De Bourdeaudhuij¹, Deborah Salvo^{4,5}, Lars Christiansen⁶, Terry Conway⁷, Rodrigo Reis⁸, James Sallis⁷

¹Ghent University, Ghent, Belgium, ²Deakin University, Burwood, Victoria, Australia, ³The University of Hong Kong, Hong Kong, China, ⁴National Institute of Public Health, Cuernavaca, Mexico, ⁵Stanford University, Palo Alto, USA, ⁶University of Southern Denmark, Odense, Denmark, ⁷University of California, San Diego, San Diego, CA, USA, ⁸Pontificia Universidade Catolica do Parana, Curitiba, Brazil

SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Recent findings from the IPEN Adult study showed that specific perceived environmental characteristics (land use mix-access, aesthetics and safety from crime) are related to accelerometer-based moderate-to-vigorous physical activity (MVPA) in adults in 11 countries worldwide. However, the strength of the associations was modest (1.2% of the within-site variance in MVPA), possibly due to the presence of moderating effects: some of the associations between the built environment and physical activity (PA) may differ systematically across socio-demographic groups. Therefore, the main aim of this study was to examine the moderating effects of age, gender and education on the associations between the perceived built environment and accelerometer-based PA outcomes.

Methods: IPEN Adult is an observational multi-country cross-sectional study, and data of 16 sites in 11 countries were included. Participants wore an accelerometer for seven days, completed the Neighborhood Environment Walkability Scale and reported on socio-demographics. In total, 7273 adults (18-65 years) were included in the analyses. To examine the moderating effects, generalized additive mixed models were conducted in R. Two PA outcomes were examined: daily minutes of accelerometer-based MVPA and the odds of meeting the weight gain/cancer prevention PA guidelines of 420 min/week of MVPA.

Results: Age moderated the associations of crime safety and no major barriers to walking with accelerometer-based MVPA: positive associations were only found in older adults. For gender, land use mix-access was linearly positively associated with MVPA in men, and curvilinearly in women. Crime safety was only related to MVPA in women. Furthermore, land use mix-access and street connectivity were only related to meeting the weight gain/cancer prevention physical activity guidelines in men. No moderating effects were found for education.

Conclusions: Some gender- and age-specific findings were present, but overall the associations between environmental perceptions and MVPA were rather independent of the examined socio-demographic factors. Future studies should focus on other potential moderators such as psychosocial factors and on potential mediators of the environment - PA relationship. Nonetheless, the current findings are encouraging, suggesting that international efforts to optimize built environments may facilitate engagement in MVPA in adults worldwide.

S1.1.3

Built environment and physical activity: Nine-country study of adults with objective measures

James Sallis¹, Ester Cerin^{2,3}, Deborah Salvo^{4,5}, Marc Adams⁶, Lawrence Frank⁷, Terry Conway¹, Ilse De Bourdeaudhuij⁸, Neville Owen⁹

¹University of California, San Diego, San Diego, CA, USA, ²Deakin University, Burwood, Victoria, Australia, ³The University of Hong Kong, Hong Kong, China, ⁴Stanford University, Palo Alto, CA, USA, ⁵National Institute of Public Health, Cuernavaca, Mexico, ⁶Arizona State University, Phoenix, AZ, USA, ⁷University of British Columbia, Vancouver, British Columbia, Canada, ⁸Ghent University, Ghent, Belgium, ⁹Baker IDI, Melbourne, Victoria, Australia

SIG: Yes, Policies and environments

Awards:

Purpose: The purpose of the present study was to document the strength, shape, and generalizability of associations of built environment variables to total physical activity, using objective measures of independent and dependent variables in an international sample of adults.

Methods: The International Physical activity and Environment Network (IPEN) Adult Study was a coordinated international study, with each country following standard methods as much as possible. The study design was to recruit participants from neighbourhoods selected to be high or low on walkability and high or low on income. Present analyses were done with 6822 adults aged 18-66 years from 14 cities in 9 countries from 5 continents. Seven indicators of walkability, transit access, and park access were assessed in 1-km street network buffers around each participant's home using Geographic Information Systems (GIS)-based methods. Total minutes of moderate-to-vigorous physical activity (MVPA) were measured by 4+ days of waist-worn accelerometer monitoring. Associations of environmental variables with MVPA were estimated using generalized additive mixed models (GAMMs) with Gamma variance and logarithmic link functions, and numerous covariates.

Results: Four of 7 individual environmental variables were significantly and linearly related to MVPA: net residential density, intersection density, transit density, and number of parks. Mixed land use variables and distance to nearest transit point were unrelated. The proportional differences in MVPA between residents living in areas with the lowest and highest observed values in individual environmental attributes ranged from ~25% to ~69%. All associations generalized across study sites (i.e., non-significant interactions with site). When adjusting for other environmental variables, only two variables remained significant, with net residential density jointly explaining 10% of between-site and 20% of between-neighbourhood differences in MVPA.

Conclusion: Using objective data in a study of 14 cities in 9 countries, residential density, intersection density, transit access, and number of parks were positively related to total moderate-to-vigorous physical activity, with residential density being the strongest correlate. Generalizability of findings across cities suggests built environment interventions hold promise as a strategy reduce the health burden of the global physical inactivity pandemic.

S1.1.4

Associations of neighbourhood environmental attributes with adults' sedentary time: IPEN Adults multi-country study

Neville Owen¹, Ilse De Bourdeaudhuij², Takemi Sugiyama³, Javad Koohsari⁴, Nyssa Hadgraft¹, Adewale Oyeyemi⁵, James Sallis⁶, Ester Cerin^{7,8}

¹Baker IDI, Melbourne, Victoria, Australia, ²Ghent University, Ghent, Belgium, ³University of South Australia, Adelaide, South Australia, Australia, ⁴University of Melbourne, Melbourne, Victoria, Australia, ⁵University of Maiduguri, Maiduguri, Nigeria, ⁶University of California, San Diego, San Diego, CA, USA, ⁷Deakin University, Burwood, Victoria, Australia, ⁸The University of Hong Kong, Hong Kong, China

SIG: Yes, Policies and environments

Awards:

Purpose: To examine associations of multiple perceived neighbourhood environmental attributes with total sedentary time assessed by accelerometer, using single environmental perceptions and a composite environmental index as the exposure variables. Region-specific and gender-specific associations were also examined.

Methods: Analyses of data from the International Physical activity and Environment Network (IPEN) Adult Study were conducted with 5,712 participants from 10 countries. The Neighborhood Environment Walkability Scale (NEWS) was used to assess 10 perceived neighborhood attributes: residential density; land use mix - diversity; land use mix - access; street connectivity; infrastructure and safety for walking; aesthetics; traffic safety; safety from crime; streets having few cul-de-sacs; and, no physical barriers to walking. The composite environmental index was created by summing the standardized scores of variables positively related and subtracting the standardized scores of variables that were negatively related to sedentary time. Total minutes/day of sedentary time and total minutes of moderate-to-vigorous intensity physical activity (MVPA) were derived from accelerometer counts. Associations of each perceived environmental attribute and the composite environmental index with sedentary time were estimated using generalized additive mixed models (GAMMs), adjusting for study site, socio-demographic covariates, objectively-measured MVPA, accelerometer wear time and area-level socio-economic status.

Results: Street connectivity was negatively related to sedentary time, while residential density, pedestrian infrastructure and safety and lack of barriers to walking were positively related. Perceived aesthetics and safety from crime were negatively related to sedentary time in women only. Land use mix was negatively related to sedentary time in men only. Associations did not differ significantly by study site. The predicted difference in sedentary time between those with the minimum (-9.2) and maximum (11.6) observed values on the composite environmental index was 71 min/day of sedentary time

Conclusion: Positive associations of residential density, pedestrian infrastructure and safety and lack of barriers to walking with objectively-measured sedentary time were unexpected. Street connectivity, land use mix and aesthetics, which have been found to be related to physical activity, may also influence sedentary time. Synergistic relationships environmental attributes with sedentary time appear to be strong and require further investigation.

S2.1 SYMPOSIUM:

Physical activity promotion around the world: How far have we come and what next? Lessons learned from regions and other fields of NCD promotion

Chair: Fiona C Bull, UWA, Perth, Australia

S2.1.1

Physical activity promotion in the European Region - developments and lessons learned

Sonja Kahlmeier

University of Zurich, Zurich, Switzerland

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To provide an overview of the key developments on physical activity (PA) promotion in the European Region and derive lessons learned for future developments

Methods: Overview of relevant framework documents, selected national policies and actions plans and activities of HEPA Europe, the European network for the promotion of health-enhancing physical activity, based on different sources, including the WHO Nutrition, Obesity and Physical Activity Database (NOPA)

Results: Early developments of the PA agenda initiated in the mid-2000s as part of the regional obesity framework. Nevertheless, the number of national policy documents published showed an increase already in the early 2000ies, likely catalyzed by the Global Strategy for Diet, Physical Activity and Health of 2004 and a regional policy event on obesity in 2006. Early representation of PA within the regional NCD agenda was not particularly strong. In 2005, HEPA Europe was launched as an exchange platform for policy makers, professionals and practitioners. By 2014, it counted 140 member institutions from 33 of the 53 countries within the region and has developed activities on a range of topics and approaches. Still within the framework of the nutrition agenda, it was in 2013 that European WHO Member States adopted a Ministerial Declaration, finally calling for the development of a separate physical activity strategy, which is being launched in 2015. In parallel, in 2013 the European Commission Directorate Education and Sport published their first ever Council Recommendation on promoting health-enhancing physical activity across sectors. The number of available national PA policy documents has increased from 3 in 2000 to 27 in 2005 and 117 in 2014.

Conclusions: After a slow start, the European PA policy agenda has gained significant momentum in recent years. The challenges of the current economic climate, a still limited workforce and the need to clearly demonstrate the most effective policy approaches have to be met to capitalize on this promising development.

S2.1.2

Physical activity promotion in the African Region - how well are we doing?

Estelle Lambert¹, Tracy Kolbe-Alexander²

¹*University of Cape Town, Cape Town, South Africa*, ²*University of Queensland, Queensland, Australia*

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To overview recent developments in physical activity (PA) in the African region, including networks, research capacity development and physical activity policies.

Methods: We will report on activities of the African PA Network (AFPAN), growth of research and implementation in the region, examples of national strategic plans and policies and sport-for-development initiatives.

Results: Activities in the region appear to track global developments, for example, the WHO Global Strategy for Diet, PA and Health (2004) and the UN High Level Summit on NCDs in 2011. AFPAN has >200 members from >8 countries, a quarterly newsletter, web-site, rotating chair-person and steering committee. In 2014, AFPAN co-hosted the first regional conference on PA and Sport for Health and Development in Mozambique with >220 delegates representing 8 countries. There are a growing number of research collaborations on PA and the built environment, health outcomes, body composition in children and interventions. Five African countries participated in the Global Summit on PA in Children and produced country report cards. Research has increased with a recent Web of Science search yielding 604 papers (>100 in 2011-2012 combined), a mean citations/paper of 13.6, and an H-index of 46. Moreover, 60% of these papers have first authors from the region. These results show promising growth in research capacity, and an emerging focus on PA and health in this region. In terms of national strategies, until recently, only Mauritius, Niger, Kenya, Ghana had physical activity plans, policies or targets. Uganda and South Africa both have non-motorised transport plans which feature PA. More recently, the South African National Strategic Plan for the Prevention and Control of NCDs committed to a population target of a 10% increase in meeting PA guidelines by 2020. In addition, PA features strongly in the National Plan for Sports and Recreation, and in the draft Implementation Plan for the Prevention and Management of Obesity.

Conclusion: The African region shows promising trends toward increased engagement in research, advocacy and policies concerning physical activity and health.

S2.1.3

Promoting physical activity in the Eastern Mediterranean Region: moving to action, lessons learnt and way forward

Faten Ben Abdelaziz

World Health Organisation, East Mediterranean, Egypt

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: In the Eastern Mediterranean Region physical inactivity is ranked second leading risk factor for NCDs with more than half of the population below recommended levels for adults and youth. This presentation will report on the rapid progress since the UN Declaration in 2011 on physical activity (PA) promotion in the Region.

Methods: The WHO regional office (EMRO) conducted an assessment of national capacities, policy status and program implementation on physical activity in 2013/14 in 22 countries. Subsequent actions at a regional and country level were collated.

Results: Results from 14 countries reveal that most countries lack the basic requirements to develop and support national actions to increase participation in physical activity. Key barriers are a lack of awareness of the importance and health implications of physical inactivity; insufficient population monitoring, limited leadership and need for stronger engagement of and coordination between relevant sectors. In response EMRO office has initiated and completed actions to support country progress. These include holding the first high level Regional Forum on physical activity attracting senior level government and non government officials from health, education, sports and youth, and urban planning; development of advocacy tools and a regional Call to Action. Other developing include establishment of a Regional PA network (EM-PAN), a Regional PA Steering Committee and plans to conduct regional training programs on national policy, primary health care and mass media approaches.

Conclusions: Significant progress has been made in EM Region to support and advance country action on physical activity. Key challenges include the limited workforce, insufficient priority and funding and the need for strong leadership within countries. Nonetheless, there has been promising development in the last 24 months and now good opportunities to learn from other countries to advance work within this region.

S3.1 SYMPOSIUM:

Food Pricing and Affordability of 'healthy' versus 'less healthy' diets: an international approach to monitoring and surveillance

Chair: Stefanie Vandevijvere, University of Auckland, Auckland, New Zealand

S3.1.1

Novel method to achieve price-optimized, fully nutritious, health-promoting and acceptable national food baskets

Alexandr Parlesak¹, Joao Breda², Aileen Robertson¹

¹*Metropolitan University College, WHO Collaborating Centre Global Nutrition and Health, Copenhagen, Denmark,* ²*WHO Regional Office for Europe, Division of Noncommunicable Diseases and Life-course, Copenhagen, Denmark*

SIG: Yes, Policies and environments

Awards:

Objective: The purpose of this study was to generate a framework for the development of health-promoting, fully nutritious, socially acceptable, and affordable national food baskets to be used as an advocacy tool by governments. In addition to containing all (micro-)nutrient requirements, food baskets should also reflect dietary guidelines to prevent non-communicable diseases and be optimized to achieve the highest possible social acceptance. So far, integrative approaches that include all these aspects are lacking.

Methods: Food composition, local availability, food prices, national and international recommendations on 'healthy' nutrition, and current respective preferences of the corresponding populations were optimized using linear programming (LP) methods (Dantzig's simplex algorithm). The desired outcomes were 'best-for-price' solutions (= food baskets) from a list of 150-190 locally available foods. The study was designed to obtain healthy, affordable, and socially acceptable diets for three European countries (Denmark, Slovenia, and Romania) and in three regions within Canada, Argentina, and Switzerland. Moreover, the costs for the "limiting" micronutrients and relative price increases were calculated after including a range of constraints (e.g. dietary recommendations vs. nutrient requirements; wider range of biodiversity (increased number of foods included) and social acceptability). All data were collected in the respective countries using standard methodology.

Results: Key micronutrients influencing the increased cost of food baskets were calcium, potassium, and the vitamins A, B₂, C and D. When additional constraints were applied by integrating food-based dietary guidelines and social acceptability (as measured by current consumption patterns, central 80% percentile), the cost increased by approximately one third and three fold, respectively. The wider range of biodiversity resulted in just minor increases in cost.

Conclusions: The cost of health-promoting, fully nutritious, and socially acceptable food baskets depended primarily on their adaptation to local dietary patterns. Fully nutritious and health-promoting food baskets can be achieved at a relatively low price. However, if these are not socially acceptable to the target population, the use of a framework using linear programming based solely on nutritional values seems limited.

S3.1.2

Developing standardized methods to assess healthy and unhealthy (current) diets in Australia

Amanda Lee¹, Matthew Dick², Christina Pollard³, Tim Landrigan³, Sarah Kane¹, Claire Palermo⁴
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SIG: Yes, Policies and environments

Awards:

Purpose: Unhealthy diets contribute at least 14% to Australia's disease burden. Compliance with dietary recommendations is particularly poor amongst disadvantaged populations (eg. low socioeconomic status, living in rural/remote areas, and Aboriginal and Torres Strait Islanders). The perception that healthy foods are expensive is a barrier to choosing those, particularly fruits and vegetables, and a major determinant of diet-related health inequities. The purpose of this research is to develop a nationally standardised tool and protocols to monitor and benchmark food prices and affordability in Australia. Limited, non-comparable state, regional, or local data suggest that healthy food costs more and that costs increase more rapidly than for unhealthy food. Globally, there is a need to develop and test approaches to assess the price differential of healthy and less-healthy diets under the food price module of the International Network for Food and Obesity/non-communicable diseases (NCDs) Research, Monitoring and Action Support (INFORMAS). This paper presents findings from work to develop a national food pricing and affordability research agenda.

Methods: The research applied the INFORMAS approach to develop standardised tools, survey protocols and data collection and analysis systems in Australia. Development of standard foods included consideration of policy drivers; consumer behaviours; marketing and promotion strategies; market share of brands and products; dietary guidelines and food policy and geographic location. Data collection was performed online and *in situ*. Analysis assessed the price and affordability of healthy and less healthy (current) diets in diverse communities across the nation, comparing results for different geographical locations/population subgroups in Australia and assessed these against international INFORMAS benchmarks.

Results: The review proposes a step-wise framework (including 'minimal', 'expanded' and 'optimal' approaches) for monitoring the price and affordability of foods, meals and diets at country level. This approach is designed to take into account differences in the available capacity, infrastructure and resources of countries to conduct monitoring. Data collection technology, including using iPads will be discussed for capturing in store pricing.

Conclusions: Findings show that there is potential for global food pricing monitoring, however, also highlight some of the barriers to undertaking routine pricing and affordability monitoring at a country level.

S3.1.3

Measuring Food Prices and Affordability - A US economist's perspective

Andrea Carlson, Elizabeth Frazao
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SIG: Yes, Policies and environments

Awards:

Purpose: Most consumers in the United States eat diets that do not meet US dietary recommendations. A common explanation is that healthier foods are more expensive than less-healthy foods.

Methods: To investigate this assumption, we compare prices of healthy and less-healthy foods using three different price metrics: the price of food energy (\$/calorie), the price per edible weight (\$/100 edible grams), and the price of an average portion (\$/average portion). We chose the first two metrics because (a) price per calorie is the metric used in the literature, and (b) price per edible weight is the scientific base for US Federal Dietary recommendations. However, if we want to understand consumer behavior, we must look at the metrics most likely used by consumers, and the cost per average portion is akin to websites and supermarket flyers in the United States which advertise "dinner for four for under \$10".

Results: Consistent with much of the literature, we find that healthy foods cost more than less-healthy foods when using price per calorie. However, the other two metrics show that healthy foods cost less than less-healthy foods. Clearly, the price metric used matters. Consumers are also interested in the total cost of their food, including food away from home. And even in cases where healthy foods cost more (per unit of energy) than less-healthy foods, this does not translate into healthier diets costing more than less-healthy diets once total energy consumed are taken into account.

Conclusions: Because consumers who eat energy-dense foods consume more energy, total energy consumed must be considered. A comparison of how consumers allocate their total food budgets shows that, in the U.S., consumers at all income levels allocate a much smaller portion of their food at home budget to fruits and vegetables and larger portion to foods high in saturated fat, added sugar and/or sodium than a budget that is in keeping with dietary guidelines.

S4.1 SYMPOSIUM:

The gatekeepers to the home: How parenting practices and perceptions affect the dietary intake and physical activity of children.

Chair: Alisha R Farris, Virginia Tech, Blacksburg, Virginia, USA

S4.1.1

Elementary parent perceptions for participating in the National School Lunch Program or packing a lunch for their child.

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Virginia Tech, Blacksburg, Virginia, USA

SIG: Yes, Motivational Dynamics

Awards: No

Purpose: In 2010, the Healthy, and Hunger-Free Kids Act (HHFKA) updated the nutrition standards for the National School Lunch Program (NSLP) in the United States. Despite the new standards and research showing lunches brought from home are less nutritious, many parents and children prefer packing lunches. The purpose of this study was to explore factors influencing the parents of elementary school children in determining whether to participate in the NSLP or pack a lunch for their child following the implementation of the new HHFKA standards.

Methods: Four elementary schools (two having the lowest and two having the highest free and reduced lunch [FRL] eligibility rates) in a rural county of the United States were identified. Parents were provided a questionnaire assessing perceptions of NSLP and packing lunches. Chi-square tests and descriptive statistics were used to evaluate differences between FRL groups and frequency of agreement. Written comments were coded and common themes identified.

Results: A total of 516 surveys were collected with 55.2% from elementary schools with higher FRL eligibility rates ($n = 285$) and 44.8% from elementary schools with lower rates. The majority (48.3%) of parents reported the HHFKA nutrition standards had no effect on their child's school lunch participation. Parents who allowed their child to participate in the NSLP four or more days per week were significantly more likely to perceive the NSLP as nutritious (67.5% vs 32.5%). The most frequent motivational factors for NSLP participation across all schools were convenience and saving time. The most frequent motivational factors for packing lunches were variety of foods, nutritional quality, and providing organic or sustainable foods (lowest FRL eligibility) and child pickiness, variety of foods, and nutritional quality (highest FRL eligibility). The written comments yielded 138 responses. Barriers to NSLP participation were taste and food preferences, nutritional and food quality, and the quantity of food provided.

Conclusions: Improvements to the nutritional quality of elementary lunches can potentially be accomplished through collaboration of the home and school environment to engage in NSLP marketing strategies, interventions with parents and students who pack lunches, and the utilization of school wellness policies.

S4.1.2

Momentary Assessment of Within-day Relations of Maternal Stress and Weight-Related Parenting Practices

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SIG: Yes, Children and families

Awards:

Objective: Parental stress is an understudied factor that may compromise parenting practices related to children's dietary intake and physical activity. However, past studies examining the association between parental stress and child obesity used retrospective measures of stress and overlooked within-day processes. The current study used an Ecological Momentary Assessment (EMA) smartphone application (app) to examine the real-time associations between maternal stress and weight-related parenting practices.

Methods: The sample included mothers ($N = 20$) (ages 26-48, 59% Hispanic) of children 9-13 years old currently participating in the MATCH (Mothers And Their Children's Health) study. The smartphone app collected EMA data across 7 continuous days, with up to 7 random EMA survey prompts per day during children's non-school time. EMA items assessed stressful feelings, perceived stress, stressful events, exposure to stressors and weight-related parenting practices (e.g., monitoring and limiting of junk food and TV/video games, and encouraging physical activity and eating fruit/vegetables) occurring over the past 2 hours. Multilevel modeling examined within-day concurrent associations between maternal stress variables and weight-related parenting practices for prompts when mothers had interacted with children in the past 2 hours.

Results: On average, mothers responded to 78% of the EMA survey prompts. At any given prompt, experiencing work stress in the past 2 hours decreased the likelihood of encouraging children to be physically active ($p = .027$) and taking children to a place to be physically active ($p = .075$). Feeling stressed was associated with an increased likelihood of allowing children to eat fast food in the past two hours ($p = .002$). Encouraging children to eat fruits and vegetables was associated with increased stress from work at home ($p = .009$) and demands made by family ($p = .016$) in the past two hours.

Conclusions: Differential stressors may be distinctly related to unique profiles of parenting behavior rather than a broad relation between maternal stress and children's obesogenic risk. Work stress appears to negatively influence parental support of physical activity. However, encouraging healthy eating may be a source of stress at home. Further work is needed to disentangle the directional nature of these relationships

S4.1.3

Process evaluation of a school-based intervention in Ecuadorian adolescents from the perspective of parents

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SIG: Yes, Children and families

Awards:**Objectives:**

To report reach, fidelity, dose and barriers of a school-based intervention in Ecuador from the perspectives of the parents.

Methods:

A pair-matched cluster randomized-controlled trial was conducted in 20 schools (1430 adolescents) in Cuenca, Ecuador (2009-2012). The trial aimed to improve dietary intake and physical activity behavior. Individual and environmental strategies were implemented in two stages. The individual strategy included the delivery of educational package. The environmental strategies included, among others activities, six parental workshops that were planned during two intervention stages. Parents were invited through a letter signed by the school principle two days in advance of a workshop. Semi-structured observations and evaluation forms filled out by all the attendants after each workshop were used to assess dose reach and fidelity. Food intake and screen time were the main outcomes and were measured at 17 months follow-up (stage-1) and 28 months follow-up (stage-2).

Results:

In total 1401 adolescents (20 schools) participated in the study. Reach of parents was low with only 15% of the invited parents attending the workshops. Among the parents that attended, 79% considered the delivered information as new, 93% reported that the workshops fulfilled their concerns, 66% believed that the timing was perfect, 96% recognized the need to change their habits. The parents scored the intervention workshops overall at 9/10. There were no differences in dose delivered, dose received and fidelity between stage 1 and 2, but the reach was higher during stage 1 (21% vs. 11%). Adolescents from the intervention group consumed significantly less harmful food groups (soft drinks, sweets, junked food and added sugar) and ate more fruit, vegetable and fiber compare to their peers in the control group. Additionally, adolescents in the intervention group showed a significant lower increase in the screen time compare to adolescents in the control group. These effects were predominant observed during stage 1 and attenuated at stage 2.

Conclusion:

The dose and fidelity of the ACTIVITAL intervention were similar in both stages. The higher reach in the first stage may have contributed to obtain more favorable results in this stage compared to the effect at stage 2.

S4.1.4

Changing parenting cognitions and practices to increase children's vegetable consumption in the home using social cognitive theory.

Patti-Jean Naylor, Ryan Rhodes, David Trill
University of Victoria, Victoria, BC, Canada

SIG: Yes, Children and families

Awards:

Background: Approximately two-thirds of the foods and calories that children consume are from home. Parents play a key role in establishing their children's eating habits because they act as "dietary gatekeepers". Research by numerous authors has highlighted three key correlates of fruit and vegetable intake in children, namely the amount of exposure, accessibility and availability, and parenting factors. Interestingly parents have a role through parenting style (modeling and rules) but also through providing exposures and availability and access. It has been suggested that collaborative food preparation and kitchen skill building may affect parental food preparation and serving efficacy, outcome expectations, rules and modeling.

Purpose: To determine if an 8-week cooking workshop intervention based on social cognitive theory and aimed at increasing children's vegetable consumption in the home by facilitating collaborative food preparation (engaging reciprocal determinism) increases parent self-efficacy (for vegetable preparation) and outcome expectations (e.g. effort, cost, children's responses); availability and access to vegetables; and preparation and serving of vegetables.

Methods: Sixty-five families with children aged 9-13 (11.1 ±1.4) were randomized into a home activity program (n=30) or home activity plus cooking workshop program (n=35). Parent vegetable serving frequency, self-efficacy, cooking confidence, access and availability behaviors and outcome expectancies were measured using a mix of established and modified instruments. General Linear Model repeated measures analysis was used to determine if the groups differed over time and by condition. Analysis utilized an intention to treat protocol.

Results: There was no significant increase in parent vegetable serving habits or children's intake. Both interventions enhanced parental feeding practices ($F(1, 63) = 42.09, p = .000, \eta^2 = 0.40$) and reduced perceived barriers ($F(1, 63) = 13.01, p = .001, \eta^2 = .017$).

Conclusion: It is possible to address some of the correlates of children's fruit and vegetable intake through engaging parents in collaborative parent/child food preparation. More validated measurement tools for parent cognitions towards vegetable preparation and gate keeping behaviors (e.g. cooking and serving) are needed.

S5.1 SYMPOSIUM:**Exploring Early Childcare Food and Activity Environments and their Influence on Children's Energy-Balance Related Behaviours**

Chair: Kathryn R Hesketh, UCL Institute of Child Health, London, UK

S5.1.1**Provider reported training needs and associations with related practices in early childhood education settings**

Chrisa Arcan¹, Cynthia Davey², Marilyn S. Nanney³
¹University of Minnesota, Minneapolis, MN, USA, ²University of Minnesota, Minneapolis, MN, USA, ³University of Minnesota, Minneapolis, MN, USA

SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective: To examine the most prevalent training needs and their associations with various related practices reported by Providers in center and family-based child care settings in Minnesota and Wisconsin, USA.

Methods: A stratified random sampling scheme was used to select 2000 licensed child-care settings serving 2-5 year old children in 2010-2011 (500 child care centers (CCC) and 500 family-based (FP) Providers in each state). A final sample of 823 Providers (MN: 446; WI: 377; 428 CCC; 395 FP) completed a 109-item survey assessing nutrition and physical activity (PA), policies, practices, training, and challenges in their settings. Using Chi-squared and Fisher's exact tests we examined Provider reported top three training needs: 1) Ways to effectively engage parents about healthy eating and PA, 2) Low cost ways to serve healthy food, and 3) Fun and easy nutrition education curricula for children by provider type. Associations, adjusted for childcare type, between reported need for each training and relevant practices (e.g. frequency of parent communication, food sources, and nutrition training) were examined using multiple logistic regression models.

Results: Child-care centers (48%) were significantly more likely than FP (40%) to report needing training for effective ways to engage parents. In CCC but not in FP sites, this training need was associated with less frequent overall parent communication and inquiring about child's PA. Adjusted for type, Providers with satisfactory parent communication were less likely to need training to engage parents; Providers who shopped at Farmer's Markets were less likely to report need for training in low cost ways to serve healthy food; and Providers who completed nutrition training in the past year and who attended nutrition training annually were less likely to report nutrition curricula training needs in CCC but not in FP sites. Providers who offered nutrition education at least three times per year were less likely to need nutrition curricula training.

Conclusions: While perceived training needs vary by childcare type, child-care settings can benefit from focused interventions that will help improve communication with parents, provide creative and cost-effective means of obtaining healthy food, and increase healthy eating and nutrition training for Providers.

S5.1.2**The effect a kindergarten-based, family-involved intervention on sedentary behaviour in preschool children from six European countries: the ToyBox-study.**

Julie Latomme¹, Marieke De Craemer¹, Greet Cardon¹, Violeta Iotova², Berthold Koletzko³, Yannis Manios⁴, Piotr Socha⁵, Luis Moreno⁶

¹Ghent University, Ghent, Belgium, ²Medical University Varna, Varna, Bulgaria, ³University of Munich Medical Centre, Munich, Germany, ⁴Harokopio University, Athens, Greece, ⁵Children's Memorial Health Institute, Warsaw, Poland, ⁶University of Zaragoza, Zaragoza, Spain

SIG: Yes, Early care and education

Awards: No

Objective: The main aim of the present study was to investigate the effect of the European ToyBox-intervention – which focused on physical activity, sedentary behaviour and dietary behaviour – on sedentary behaviours (i.e., TV viewing, computer use and quiet play) in preschoolers from six European countries (Belgium, Bulgaria, Germany, Greece, Poland, and Spain).

Methods: In total, 5529 parents/primary caregivers of preschoolers (mean age: 4.73 (SD=0.44), 51% boys) filled in a parental questionnaire before and after the intervention, in which questions were asked about preschoolers' sedentary behaviours (i.e. time spent in watching TV, computer use and quiet play). Sedentary behaviour outcomes were calculated for an average day, weekday and weekend day. Multilevel Repeated Measures analyses were conducted to measure the intervention effects for the total sample and for each country separately.

Results: For the total sample, some positive intervention effects were found. Preschoolers from the intervention group showed a less strong increase from baseline to follow-up in computer use on a weekday ($\beta = -2.36$, $p < .05$; increase control group, 7.22 min.; increase intervention group, 4.86 min.), on a weekend day ($\beta = -3.44$, $p < .05$; increase control group, 13.84 min.; increase intervention group, 10.32 min.), and on an average day ($\beta = -2.58$, $p < .05$; increase control group, 9.10 min.; increase intervention group, 6.52 min.) compared to the control group. Additionally, results showed significant three-way interaction effects (time x condition x country), which means that significant differences in intervention effects between the countries were observed. These differences between the countries are being explored and will be presented

Conclusion: This study showed that there were positive intervention effects of the ToyBox-intervention on European preschoolers' sedentary behaviours in the total sample. Furthermore, also differences in intervention effects between countries were observed, which shows that a standardized intervention might induce different effects across different countries. Therefore, it is important that future interventions search for alternative strategies for the countries in which the intervention had no or little effect. Finally, as these are only preliminary results, further and more detailed analyses are still in preparation.

S5.1.3

Children's Influence on Home Child Care Provider's Feeding Practices: Exploring Bi-Directional Influences

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SIG: Yes, Early care and education

Awards:

Purpose: To explore how children influence the feeding practices of family child care homes providers.

Methods: As part of a larger ongoing study, direct observation of breakfast, lunch and snack were completed on two different days in 28 family child care homes (n=168 observations). The observation protocol instructed data collectors to write brief descriptions of episodes where child behaviors influenced providers' feeding practices. Through training, data collectors were given examples and possible scenarios of what children might do or say to elicit such interaction. Written descriptions of these episodes captured the child behavior that initiated the interaction and the provider response. Content analysis was used to analyze themes from the written observations.

Results: A child's refusal to eat a certain food or foods elicited the most provider reactions. The main response by providers to child refusal was 1) use of rewards, pressure or threats and 2) use of verbal prompts for the child to eat. Providers did not generally ask children to finish the food on their plates, unless children requested more food before finishing foods already on their plate. A child's positive comments about food elicited positive verbal comments from the providers.

Conclusion: Our results suggest that providers may change or use different feeding practices based on what the child is doing or saying such as refusing to eat a food. To date the literature on feeding practices has been largely unidirectional, where the parent or provider is the agent acting upon the child. Future work should continue to explore how children's food behaviors may elicit providers' responses. Interventions and trainings for providers can then provide better instruction on how to react with more responsive feeding strategies to these situations.

S6.1 SYMPOSIUM:

Going Green: Innovative Approaches for Understanding the Value of Parks to Physical Activity and Public Health

Chair: Andrew T Kaczynski, University of South Carolina, Columbia, SC, USA

S6.1.1

ParkIndex: A tool for advancing parks and public health research and practice

Andrew Kaczynski¹, Jasper Schipperijn², J. Aaron Hipp³, Sonja Wilhelm Stanis⁴, Gina Besenyi¹, S. Morgan Hughey¹, James Hussey¹
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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Despite significant enthusiasm for park research and provision, it remains unclear which park metrics are most associated with park use and how best to combine diverse indicators into a parsimonious measure of park access and exposure. This abstract describes an ongoing study to develop ParkIndex, a tool that incorporates elements related to park proximity, features, quality, and the surrounding neighborhood to allow researchers, planners, and citizens to evaluate the potential for park access and use for a given area (e.g., residential buffer, census tract).

Methods: Comprehensive park access and use information for 893 households in Kansas City will be used to develop a ParkIndex prototype. Based on a literature review and input from professionals, an initial set of factors to be included in the prototype will be selected. Using the KC data, development of ParkIndex will begin by modeling the probability that a random respondent visits a park at least once per week. Several models will be evaluated with the goal of obtaining a minimum set of park proximity, features, quality, and neighborhood variables that adequately model park use, based on likelihood ratio tests and generalized R². Ultimately, we will generate a ParkIndex raster surface or 'heat map' with higher values (0 to 100) representing a higher probability of visiting a park for a given address.

Significance: This innovative project will combine diverse methods and the expertise of both researchers and practitioners to develop an evidence-based yet user-friendly tool to better predict the potential for park use in communities. ParkIndex will have both conceptual and practical significance in that it can be used by researchers (e.g., to apply consistent, empirically-derived metrics of park access across studies) and by diverse professionals as a scenario planning tool for encouraging greater population-level park use (e.g., to estimate the effects of adding a certain-sized park to a neighborhood or a playground or restroom to an existing park). The methods and future directions for ParkIndex will provide significant fodder for an informed discussion about issues related to measuring park access and the application of this research for equitable and strategic community park planning.

S6.1.2

Physical activity patterns in neighbourhood parks: a quasi-experimental mixed-methods study

Gavin McCormack, Melanie Rock, Taryn Graham, Kenda Swanson, Lindsay Burton, Alessandro Massolo
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Background: The characteristics of urban parks have been linked to physical activity behaviour. Few studies, however, have examined the extent to which the modification of park characteristics impacts park use and physical activity. Furthermore, little research has incorporated both qualitative and quantitative research approaches when studying park settings. This study integrated qualitative and quantitative methodologies to better understand the nuanced interrelationships between physical activities, visitors, park characteristics, and attributes of the surrounding neighbourhoods.

Methods: This quasi-experiment (control group pretest-posttest design) assessed the impact of implementing a 'dog off-leash' municipal policy on physical activity in four purposively-sampled parks in Calgary, Alberta, Canada. These four intervention parks were compared with a control group (i.e., four 'existing' off-leash parks). Quantitative data, including patterns of use, physical activities, and visitors' sociodemographic characteristics were captured using systematic direct observation. Qualitative data, including park characteristics and patterns of use, were generated through field-noting and digital photography and captioning. Pretest quantitative data were synthesized along with pretest qualitative data for the four intervention parks only using a multiple-case study approach. Pretest and posttest quantitative data on physical activity in the intervention and control parks were compared using descriptive statistical analyses including Pearson's Chi-Square and ANOVA.

Results: Activity types (sedentary, walking, dog-related, cycling, and play), patterns of visits (time of day, day of week), and sociodemographic characteristics (age, group) differed between the four intervention parks at pretest. Park use and activity was associated with sociodemographic characteristics of the surrounding neighbourhoods in addition to park-specific physical and social environments. Fewer visits by children, as well as fewer visits during afternoons, were found after parks were designated as 'off-leash'. For the most part, the prevalence of specific park-based physical activities did not change from pretest to posttest. However, in general the intensity of physical activities undertaken in the intervention parks from pretest to posttest decreased among children but not adults.

Conclusions: Park and neighbourhood characteristics influence park use and physical activity. Designating existing 'on-leash' parks as 'off-leash' has the potential to modify the type of activities undertaken inside the park as well as the profile of park visitors.

S6.1.3

Psycho-physiological responses to walking in natural and urban environments

Christopher Gidlow¹, Marc Jones¹, Gemma Hurst¹, Daniel Masterson¹, David Clark-Carter¹, Mika Tarvainen², Mark Nieuwenhuijsen³
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Background: Mechanisms behind the natural environments-health positive relationship include physical activity, social interaction, stress reduction, and attention restoration. However, these are largely not well-understood. Laboratory and field experiments comparing psychological and physiological responses to urban and natural environments offer broad support for: i) greater benefits for restoration, ii) stress reduction and improved mood in natural environments; and iii) physical activity in natural environments conferring psychological benefits. However, data on physiological effects remain inconclusive, and comparator urban environments are often inherently stressful, prompting negative responses to urban contexts rather than positive responses to nature. As part of the PHENOTYPE project, this study presents experimental data to explore psycho-physiological responses to walking in 'pleasant' urban and natural environments.

Methods: A randomised, cross-over, within-subjects field-based experiment involved adults from Stoke-on-Trent, UK. Participants visited the university at the same time (pm) on three days to complete a 30-minute walk (self-directed pace) in one of three environments: residential (urban), natural (green), or natural with water (blue). Psycho-physiological responses were measured in terms of mood, cognitive function, perceived restoration, salivary cortisol, and heart rate variability (HRV). Repeated measures ANOVA explored possible environmental differences in changes from baseline (T1) to the end of the 30-minute walk (T2), and 30 minutes later when returned to the university (T3).

Results: Data from 38 healthy participants (65% male; mean age 40.9±17.6 years; low baseline stress) showed significant improvements from baseline to T2 and T3 for mood and cortisol in all environments. Perceived restoration was significantly better in green and blue environments (versus urban), with similarly greater improvements in cognitive function in both natural environments compared with urban at T2 and T3. We did not find consistent evidence of beneficial HRV responses in natural versus urban environments.

Conclusions: A 30-minute walk at self-directed pace in a non-stressful environment conferred psychological and physiological benefits, regardless of the urban/natural condition. We potentially did not replicate some previously-reported natural-urban differences because of our efforts to mitigate the 'bad urban' effect. However, our data provide evidence that natural environments can have additional restorative benefits that persist for at least 30 minutes after leaving the environment.

S6.1.4

Examining park features for adolescents: the Pick-A-Park study

Jenny Veitch¹, Anna Timperio¹, Jo Salmon¹, Shaun Bangay¹,
Benedicte DeForche², Kate Parker¹
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SIG: Yes, Policies and environments

Awards: No

Background: Little is known about specific park features that may encourage adolescents to visit or to be physically active in parks. This is important if we are to avoid building parks that fail to support and encourage use by this important age group. This study involved the use of images to identify critical characteristics of parks that are associated with adolescents' use of parks and willingness to be physically active within these settings.

Methods: Secondary schools located in low, mid, and high SES areas of metropolitan Melbourne, Australia were recruited and students aged 13-16 years were invited to participate. A wide range of features that may influence adolescents' willingness to visit and be physically active in parks were photographed. A computer application that included 44 images of park features was created and these images were presented one-by-one to participants in random order on an Apple iPad*. Participants rated each image individually according to how likely they would be to visit the park depicted in the image and how likely they would be to be active in the park, both on a 10-point Likert scale (1=not likely, 10=highly likely). To obtain more detailed insights, participants also indicated characteristic(s) in each image that had the greatest positive influence (using a 'thumbs up' symbol) and negative influence (using a 'thumbs down' symbol) on their rating.

Results: 99 adolescents (mean age 13.3 years (SD=0.87), 52.6% female) constituted the final sample. The five features that were most likely to make the adolescents want to visit the park included (mean score): large slide (7.47), flying fox (7.08), large swing (6.74), table tennis tables (6.71), and wooden adventure playground (6.54). Similar scores were observed for features most likely to make adolescents want to be active. The five most disliked features (most 'thumbs downs') included: skate bowls/ramps, steps, toilets, signage with rules, and graffiti.

Conclusion: This study used images to provide insight into features that may be important for attracting adolescents to parks and represents a key first step in better understanding the needs of adolescents when upgrading or designing new parks to encourage active use.

S7.1 SYMPOSIUM:

Measurement and Evaluation of Multi-level Multi-Component Community Based Health Interventions

Chair: Joel Gittelsohn, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA

S7.1.1

Monitoring and evaluation of the B'More Healthy Communities for Kids program: A multi-level, multi-component obesity prevention program for low-income, urban African American children

Joel Gittelsohn, Anna Kharmats, Elizabeth Anderson Steeves, Cara Shipley, Sarah Rastatter, Tracy Yang, Yeeli Mui
Global Obesity Prevention Center, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA

SIG: Yes, Policies and environments

Awards:

Objectives: BHCK is a multi-level, multi-component (MLMC) obesity prevention program for low income African American youth in Baltimore. The intervention occurs at the child, family, youth leader, recreation center, community food environment and policy levels. The BHCK intervention includes training of corner store and carryout owners, interactive sessions, discounts and stocking of healthy foods, social media, SMS messaging, work with policymakers, and nutrition lessons in recreation centers. The objective of this presentation is to describe challenges and solutions for monitoring and evaluation of this MLMC trial.

Methods: BHCK is evaluated at all levels through process and impact measures. Process measures assess reach, dose and fidelity – with success determined by a set of 88 intervention standards. Pre-post program impact measures are taken at each intervention level. A primary set of measures have been developed to assess change in psychosocial factors (knowledge, self-efficacy, intentions), food-related behaviors (purchasing, preparation and consumption) and BMI in a sample of 500 child-adult caregiver dyads.

Results: To date, differences have been observed between intervention components regarding implementation success, with moderate to high reach, dose and fidelity observed. 45% of sampled children are overweight or obese. 81% of children reported getting food at corner stores, carry-outs, and fast-food restaurants, and 63% purchase foods high in fat or sugar at these food sources at least once a week. 81% of caregivers were overweight or obese. Household income averages less than \$20,000, and 67% reported some level of household food insecurity. Multiple challenges have been encountered in BHCK monitoring and evaluation, including: recruiting adult-child dyads and food sources for the evaluation; determining how to document change in food source stocking and sales; determining exposure to tease out impact of specific interventions; finding methods for effective follow up; and balancing sustainability with risk of contamination. Solutions have included formative research, instrument piloting and use of modeling to plan the selection of monitoring and evaluation approaches, using translators to overcome language barriers, and multiple visitation recruitment strategies.

Conclusions: Monitoring and evaluation of MLMC trials is complex and costly. We have identified multiple best practices are needed to guide future trials.

S7.1.3

The Children's Healthy Living (CHL) Program for Remote Underserved Minority Populations of the Pacific Intervention

Rachel Novotny¹, Claudio Nigg¹, Kathryn Braun¹, Aufai Areta², Andrea Bersamin³, Jang Kim⁴, Rachael LeonGuerrero⁵
¹University of Hawaii, Honolulu, Hawaii, USA, ²American Samoa Community College, Pago Pago, American Samoa, ³University of Alaska, Fairbanks, Alaska, USA, ⁴College of the Northern Marianas, Saipan, Northern Mariana Islands, United States Minor Outlying Islands, ⁵University of Guam, Mangilao, Guam

SIG: Yes, Policies and environments

Awards:

Objective: To describe methods used to develop and evaluate the multisite, multilevel, multicomponent, community randomized intervention trial for child obesity prevention in the CHL program.

Methods: CHL used the ANGELO framework for community participation and involvement and review of literature following Brennan guidelines to develop the intervention. CHL developed and implemented a region-wide training and standardization of anthropometric and other measures for monitoring and evaluating the intervention, degree training for 2 individuals from each participating jurisdiction, and on-the-job training for partners and staff. Intervention monitoring tools included monthly reporting of activities and participants and intervention exposure measures post intervention.

Results: Intervention effect was evaluated using a community readiness tool and a Community Assessment Toolkit (CAT), that examines key institutions in the community for supports of a healthy lifestyle, such as healthy food in stores and presence quality parks for active play and changes in children's food intake and physical activity were also assessed by questionnaires, logs and accelerometers, and by BMI, waist circumference and acanthosis nigricans.

Conclusions: CHL developed key partnerships and ultimately coalitions in order to sustain an ongoing BMI monitoring system, training program, key elements of intervention, and to advocate for policy change, in the underserved US affiliated Pacific region not covered by US national monitoring systems.

S8.1 SYMPOSIUM:

Why we overeat and how experimental psychology can help

Chair: Frédérique Mensink, Netherlands Nutrition Centre, The Hague, The Netherlands

S8.1.1

"Keep calm and resist temptation": Impulse buys of unhealthy foods

Frédérique Mensink
 Netherlands Nutrition Centre, The Hague, The Netherlands

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To gain insight in the extent to which consumers are aware of unhealthy food temptations in public places and near checkouts, and consumers' opinions on this issue and their awareness of being tempted to buy unhealthy snacks.

Methods: A representative sample of 2646 Dutch adults (age 18 onwards) filled in an online questionnaire about unhealthy snacks in the public food environment and the extent to which people feel tempted to buy and consume these.

Results: 31% of Dutch people buy snacks sometimes, often or always, during shopping or travelling, to eat right away. For 67% of the people this purchase is more often on impulse than planned. Almost half of the people (47%) find the foods being offered in public places mostly unhealthy. People more often buy unhealthy (40%) than healthy snacks (27%). 26% feels guilty sometimes afterwards, and 6 out of 10 people desire healthier alternatives. More than half of the population (57%) says they find it easy to refuse unhealthy foods.

29% of Dutch people doesn't find it normal to be confronted with sweets or chocolate bars at the checkout, 27% does find it normal. Also, 29% is annoyed by such offers at the checkout. People find it customer unfriendly and intrusive. 1 out of 5 people feels sometimes guilty after buying sweets or chocolate offered near a checkout. A large majority (59%) finds it annoying when a cashier points them to an offer of sweets or chocolate. 30% of Dutch people desire healthy alternatives at the checkout.

Conclusions: People claim to be aware of the unhealthy food environment and resistant to unhealthy snacks. However, these data show people often buy unhealthy snacks on impulse. Moreover, a significant part regrets unhealthy purchases and is annoyed by checkout offers. These data suggest that, although consumers claim to be aware of unhealthy foods in the environment, many are tempted to impulsively purchase these. Consumers think they can resist temptation, but, in fact the environment strongly influences their food choices. This issue needs an integrated approach: increasing consumers' awareness of the obesogenic environment, providing coping strategies, and a more health-friendly store management.

S8.1.2

Can Approach Impulses to Unhealthy Food be Trained Down? Testing Approach Avoidance Training in the Eating Domain

Daniela Becker¹, Nils B. Jostmann¹, Rob W. Holland^{1,2}

¹University of Amsterdam, Amsterdam, The Netherlands,

²Radboud University Nijmegen, Nijmegen, The Netherlands

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Everyday, many people are frequently confronted with tasty but unhealthy foods. Research suggests that the mere perception of such hedonic food cues can evoke the impulse to approach and thus to consume. Accordingly, dual-process models propose that impulsive behavior plays a key role in the development and maintenance of maladaptive eating patterns. Based on that reasoning, we hypothesized that toning down this initial approach impulse should help control eating behavior more effectively. Research outside the eating domain has already shown that approach avoidance training, a computer-based paradigm which aims to modify automatic behavioral dispositions towards hedonic stimuli, is an effective tool to weaken unhealthy impulses. The present research is the first to test the effectiveness of approach avoidance training in the eating domain.

Methods: We conducted three single session studies in a normal-weight female student population (total N = 271), in which the experimental group was always trained to avoid pictures of unhealthy food and to approach pictures of healthy food or neutral objects. We measured participants' approach/avoidance biases before and after the training, and investigated training effects on participants' implicit and explicit preferences, and actual food choice (Study 1) or consumption (Study 3).

Results: In line with previous research in other health domains, Study 1 suggested that successfully trained participants made healthier choices compared to participants in the control condition. However, Study 2 and 3 (replication studies with more power and improved methodology) could not replicate this pattern of results. Together, we found no conclusive evidence that a single session of approach avoidance training can change participants' implicit and explicit food preferences and eating behavior.

Conclusions: A single session of approach avoidance training in the eating domain does not seem to have the same clear-cut beneficial effects as research in other health domains suggests. Perhaps more training sessions are needed to change relatively strong food preferences. Also, training might be more effective in an overweight sample. Both shortcomings are currently addressed in a follow-up study. Further research is necessary because approach avoidance training may offer a valuable, though low-cost and easy-to-administer addition to common weight-loss programs.

S8.1.3

Using cognitive training to modify eating behaviour

Natalia Lawrence¹, F Verbruggen¹, S Morrison², J Zhou¹, D.M.

Parslow¹, J O'Sullivan¹, R.C. Adams², C.D. Chambers²

¹University of Exeter, Exeter, Devon, UK, ²School of Psychology, Cardiff University, Cardiff, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Our aim is to understand and modify reward responses to food pictures (such as those used in adverts) in order to reduce overeating. Our research has shown that individual differences in brain reward responses to food pictures interacts with self-control to predict food consumption and BMI: Individuals with high food reward responses and low self-control are particularly vulnerable to our obesogenic environment. Our research question is: Can these food-related reward responses be reduced, and food intake and weight decreased, through computerized cognitive training? We have examined this using response inhibition training to foods and traffic light food nutrition labels, training people to 'go' to healthy foods or green food labels and to 'stop' to unhealthy foods or red food labels.

Methods: Groups of 25-45 adult participants performed computer tasks that trained them to respond (using a key press) to pictures of healthy foods/labels and to inhibit (suppress) responding to unhealthy foods/labels. Control groups undertook similar response inhibition training using pictures of non-food objects. Single training session studies were undertaken in the lab and one multiple training session study was undertaken in the real world using online training from home or work. Training effects on a range of lab and real-world eating-related dependent variables (food intake, food diaries, food evaluations, food choice and weight loss) were examined.

Results: Training people to stop to unhealthy foods/labels and to respond to healthy foods/labels resulted in: Significant real-world weight loss and reduced calorie intake (~220 kcal/day estimated from food diaries), reduced food intake in the lab (by 30-50%), reduced choices for unhealthy foods and decreased affective evaluations of unhealthy food.

Conclusions: These findings suggest that training responses to food pictures and food labels using computerized tasks can significantly improve eating behavior and weight loss. This training is quick, simple and easy to implement as it can be freely delivered online. Excellent adherence (97%) to, and positive feedback about the online training suggests that this intervention is acceptable and has the potential to improve public health by reducing overweight and obesity.

S8.1.4

Communicating eating-related norms: suggestions are more effective than restrictions

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Many health promotion interventions include normative messages, informing the public of what they should or should not do. However, previous research has shown that communicating such eating-related norm messages (e.g. 'you should not eat unhealthy food') sometimes backfires and actually leads to increased intake of unhealthy foods. In the current studies, we aimed to investigate if a suggestion - a milder way of communicating normative information - was more successful in curbing intake of unhealthy food than a restrictive norm. We also investigated how restrictive and suggested norms affected psychological reactance.

Methods: Students (N = 88 in Study 1, N = 51 in Study 2) completed a creativity task while a bowl of M&M's was within reach. Consumption was either explicitly forbidden (restrictive norm) or mildly discouraged (suggested norm). In the control condition, consumption was either explicitly allowed (Study 1) or M&M's were not provided (Study 2). We unobtrusively measured consumption during this phase. Reactance was assessed after the creativity task. Subsequently, a taste test was administered where all participants were allowed to consume M&M's. ANOVA's were conducted to investigate effects on initial consumption (i.e. during the creativity task), on reactance, and on consumption during the taste test.

Results: Across both studies, consumption during the creativity task was rare in both the restrictive- and suggested-norm-conditions, indicating that both are equally successful in preventing initial consumption. Participants in the restrictive-norm-condition reported higher reactance than participants in the suggested-norm-condition and they consumed more M&M's in the free eating taste-test phase than suggested-norm-condition participants and control-group participants, indicating a negative after-effect of restriction.

Conclusions: Results show that there are more and less effective ways to communicate eating-related normative messages. A restrictive norm, as compared to a suggested norm, induced psychological reactance and led to greater unhealthy consumption when participants were allowed to eat freely. When communicating eating-related norms to help the public successfully navigate the obesogenic environment, it is thus of importance to pay close attention to how these normative messages are framed.

S9.1 SYMPOSIUM:

Promoting Physical Activity and Health through Exergaming in Children

Chair: Zan Gao, University of Minnesota, Minneapolis, Minnesota, USA

S9.1.1

Effect of School-based Exergaming on Children's Physical Activity and Sedentary Behaviors

Zan Gao¹, Charles Huang², David Stodden³, Nida Roncesvalles⁴, Zachary Pope¹

¹University of Minnesota, Minneapolis, Minnesota, USA, ²Wayland Baptist University, Plainview, TX, USA, ³University of South Carolina, Columbia, South Carolina, USA, ⁴Texas Tech University, Lubbock, TX, USA

SIG: Yes, e- & mHealth

Awards:

Purpose: To examine the effect of an exergaming intervention on children's accelerometer-determined physical activity (PA) and sedentary behaviors as compared with physical education (PE).

Methods: A total of 261 second and third grade children (134 girls; $Mean_{age} = 8.27$; 73% White) were recruited from two Texas elementary schools. Children's pre-test 5-day PA and sedentary behaviors were assessed in September 2012. Participants were assigned to one of two groups with the school as the experimental unit for a total of two years: (1) exergaming intervention group (alternating 25-minute PE and 25-minute exergaming daily); and (2) Control group (25-minute daily PE). All children underwent identical assessments in May 2013 (mid-test) and May 2014 (post-test). The outcome variables were children's daily average minutes in MVPA, light PA (LPA) and sedentary behaviors determined by ActiGraph accelerometers from 8:00am-10:00pm.

Results: On average, children engaged in 35.84-minutes, 45.79-minutes and 37.24-minutes daily MVPA at the 3 time points. Repeated Measures ANOVA for MVPA yielded a significant main effect for Time, $F(1, 147) = 27.04$, $p < 0.01$, $\eta^2 = 0.27$. Specifically, both intervention children and control children had significantly increased MVPA time in Year 1, but both groups showed a decrease in MVPA at the end of Year 2 ($ps < 0.01$). Similarly, children engaged in 209-minutes, 233-minutes and 202-minutes LPA, respectively. A significant main effect for Time again emerged for LPA, $F(2, 146) = 15.56$, $p < 0.01$, $\eta^2 = 0.18$; showing the same change pattern as MVPA. Additionally, children demonstrated an average of 593-minutes, 557-minutes, and 595-minutes sedentary time, respectively. There was a significant Time effect for sedentary time, $F(2, 146) = 11.89$, $p < 0.01$, $\eta^2 = 0.14$. Lastly, no significant interaction or intervention effects for MVPA, LPA and sedentary behaviors were found.

Conclusions: Both groups had significant increases in MVPA and LPA and decreases in sedentary time in Year 1. Thus, exergaming could have the same positive effect on PA as PE. However, this positive effect waned as children grew in Year 2. Findings may be interpreted along with child growth and maturation.

S9.1.2

Who Benefits More from an After-School Active Video Game Intervention Regarding Physical Activity Promotion in Children? A Subgroup AnalysisYan Liang¹, Ralph Maddison², Yannan Jiang⁰¹Hong Kong Baptist University, Hong Kong, China, ²University of Auckland, Auckland, New Zealand

SIG: Yes, e- & mHealth

Awards:

Purpose: A quasi-experimental study was conducted between September 2013 and May 2014 to determine the effect of an after-school active video game (AVG) intervention on objectively measured physical activity (PA) in Hong Kong children. This subgroup analysis examined whether the intervention effect was different among children with high- or low-levels of baseline PA related self-efficacy, enjoyment, social support from family, and social support from friends.

Methods: 87 eligible children participated in the study (intervention n=30; control n=57). The AVG intervention was delivered over 8 weeks and consisted of AVG play at school, twice per week, each of 1-hour duration. Children in the control group did not play AVGs and engaged in their usual after-school activities. Children's PA levels during five school days were measured by accelerometry at baseline and 8 weeks. Non-wear time was defined as 60 minutes or more of consecutive 0 records. If there were 60 minutes or more of wearing time during after-school time (3:00-10:00pm) in one weekday, the data of that day were validated. To be included in the analyses, participants needed to provide at least two days of valid data. Self-efficacy, enjoyment, and social support were measured by previously validated questionnaires. Participants were classified into the high- or low-level group of the respective variables using the baseline median values. Changes in average after-school time on moderate-to-vigorous physical activity (MVPA) were compared between groups using adjusted linear regression models.

Results: Significant treatment effects were found in children with low self-efficacy (5.00 minutes, 95% CI 1.04 to 8.95; p=0.02), more family support (4.37 minutes, 95% CI 0.55 to 8.19; p=0.03), and less peer support (5.00 minutes, 95% CI 0.34 to 9.66; p=0.04). A marginally significant treatment effect was found in children with low level of enjoyment (4.51 minutes, 95% CI -0.11 to 9.13; p=0.06).

Discussion: These results suggest that after-school AVG intervention might work better in children with low levels of self-efficacy, peer support, and enjoyment to promote PA. This study also suggests the importance of engaging family in school-based PA interventions.

S9.1.3

Kindergartner's Accelerometer-determined Physical Activity and Sedentary Behaviors in Exergaming

Zachary Pope, Zan Gao

University of Minnesota, Minneapolis, MN, USA

SIG: Yes, e- & mHealth

Awards: No

Purpose: Exergaming is gaining popularity as a viable means of promoting children's physical activity (PA) levels. Yet, objective measurement of PA among young children such as kindergartners during exergaming is lacking. The purpose of this study was to 1) objectively assess kindergartner's PA and sedentary behaviors during exergaming using accelerometers; and 2) examine gender differences in the preceding variables during exergaming.

Methods: Participants were 98 kindergartners (49 girls) from a suburban elementary school in Western Texas. Each week children participated in 125 minutes of school-based structured PA, alternating between physical education (PE) class and exergaming. That is, the first week consisted of three 30-minute PE classes and two 30-minute exergaming sessions while the second week consisted of three exergaming sessions and two PE classes. The class ranged from 16-21 students. One Xbox Kinect video game console was used for exergaming with Just Dance for Kids in this study. ActiGraph accelerometers were used to capture children's PA and sedentary behaviors for three exergaming sessions. Children's percentage of time spent in moderate-to-vigorous physical activity (MVPA), light PA (LPA), and sedentary behaviors as well as steps/minute were obtained from accelerometry data.

Results: Children engaged in sedentary behaviors, LPA, and MVPA for 52.6%, 27.4%, and 20.0% of the exergaming sessions, respectively. However, no significant differences between gender were observed with regard to sedentary behavior (p = 0.85), LPA (p = 0.81), and MVPA (p = 0.66). Further, accelerometry data indicated the children had, on average, 29.1 step/minute while playing exergaming. Again, no significant gender differences emerged on steps/minute (p = 0.95).

Conclusions: While no gender differences were observed for the parameters assessed via accelerometry, the data did indicate exergaming to be a feasible manner in which to increase the LPA and MVPA of kindergarten children-suggesting this population is capable of engaging successfully in exergame play. Thus, implementation of exergaming interventions in young children is advised as these interventions might yield beneficial health outcomes.

S9.1.4

Active Video Games May Have Potential for Movement Skill Acquisition in Young Children

Ryan Hulteen¹, Nicola D. Ridgers², Tara Johnson², Jo Salmon², Robin Mellecker³, Lisa Barnett¹

¹University of Newcastle, Newcastle, NSW,, Australia, ²Deakin University, Melbourne, VIC, Australia, ³University Hong Kong, Pokfulam, Hong Kong

SIG: Yes, e- & mHealth

Awards: No

Purpose: Active video games (AVG) enable individuals to engage in physical activity during game play, yet it remains unclear whether children can learn correct skill form. The study purpose was to determine whether correct movement skill components can be observed in sports games (e.g. tennis, table tennis, golf, baseball, soccer) played using the Xbox Kinect.

Methods: Nineteen primary school children (10 boys) aged from 6 - 10 (M: 7.9 years) participated in six 50-minute Kinect Sport sessions. Using a previously validated observation tool for active gaming and movement, children were observed once per session for 10 consecutive minutes. The observer alternated between 10-second observation intervals and 10-second record intervals. Game engagement (yes/no), sport played (e.g. tennis), movement skill (e.g. one hand strike, two handed strike, golf swing, golf putt, overhand throw, kick, catch), and body movement (no, little, arm, leg, or whole body movement) was recorded. Also, the correct component execution (yes/no) for each skill was recorded. Each skill had between 2 and 4 components derived from the Test of Gross Motor Development. The percentage of total correct skill components observed for a given sport was calculated by dividing the total number of components observed (i.e., number of times component one plus component two plus component three were observed) by the total number of skill components possible in a given number of intervals a skill was observed for. The percentage of observations spent in a specific body movement for a given sport was calculated by dividing the number of times a body movement was observed by the total number of intervals a sport was played.

Results: Children exhibited a higher percentage of total correct skill components during baseball (42.3%), tennis (42.1%), and table tennis (39.2%), as opposed to golf (21.8% golf putt, 10.7% golf swing) or soccer (4.8%). However, whole body movement was more common in soccer (44.7%), compared to tennis (35.9%), baseball (35.1%), golf (33.9%) and table tennis (30.9%).

Conclusions: Movement skill performance in terms of specific components were observed during AVG play, but in some games skills may be performed without need for much bodily movement.

S1.2 DEBATE:

High intensity exercise as a public health strategy

Chair: Knut-Inge Klepp, University of Oslo, Oslo, Norway

S1.2.1

High-intensity exercise training could be a big HIT: Time to ditch the dogma of traditional physical activity promotion

Alan M Batterham

Health and Social Care Institute, Teesside University, Middlesbrough, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Low-volume, high-intensity exercise training (HIT) leads rapidly to a broad spectrum of cardio-metabolic benefits. The resurgence of research interest in HIT has focused attention on its potential for influencing public health. The purpose of this presentation is to show that HIT can be an important player in public health promotion as part of a flexible menu of options addressing behavioural risk factors.

Methods: Critical review of the literature with insight from evolutionary medicine and 'Occam's razor'.

Results: Attempts to modulate - rather than temporarily perturb - physical activity levels to improve health outcomes have been unsuccessful. In different target groups (children, adolescents, adults) and different settings (school, community, workplace), any observed increases in physical activity levels are typically trivial-to-small and short-lived. Interventions delivered to individuals, communities, or populations (e.g. via social marketing) have had little long-term impact. In short, physical activity promotion has been a spectacular failure. Evolutionary biology and psychology provide plausible explanations for this lack of success. Promoting HIT as part of a smörgåsbord of physical activity choices that can be tailored to needs and preferences is a valuable addition to the health promoter's armoury. With the insight of evolutionary medicine, it might prove more fruitful to view physical activity as an exposure that can be manipulated intelligently, rather than as an outcome. The aim of interventions involving HIT is not typically to increase physical activity levels. Rather, the target is to produce rapid physiological adaptations benefiting health. Frequently raised objections to HIT include:

- 1. *It is too intense, leading to negative feelings and emotions, and is unlikely to be sustainable.*
- 2. *It is not really 'time-efficient'.*
- 3. *It requires specialist facilities/ equipment.*
- 4. *It is only for young and fit people.*
- 5. *It could be unsafe.*
- 6. *It will not combat obesity.*

These common counterarguments will be challenged in the debate.

Conclusions: There is great potential for HIT interventions to contribute to addressing areas of public health priority, including prevention and treatment of Type 2 diabetes and cardiovascular disease. As a potent weapon in waging war on non-communicable disease, HIT should be embraced not dismissed.

S1.2.2

Let's HIT it on the head! Why high intensity exercise is not a viable public health strategy

Stuart Biddle

Institute of Sport, Exercise & Active Living, Victoria University, Melbourne, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: High intensity exercise, in various forms, has long been known to produce many beneficial physiological adaptations. A dose-response curve has been widely accepted for many years. However, the currently popular trend for advocating widespread use of high intensity training (HIT) for public health gain requires further thought and debate.

Methods: Critical appraisal of literature and narrative synthesis.

Results: Public health gains will be made when at least small changes to appropriate behaviours can be achieved across large populations. Benefits to clearly defined clinical populations do not fall under the remit of public health. A case will be made that high intensity exercise can never fulfil the criteria of public health gain as too few people will sustain such behaviour. This is mainly based on the premise that, according to the Dual-Model Model of exercise affect, such exercise is psychologically aversive. Studies supporting high intensity exercise are usually with young and fit adults not representative of the wider public. Other perceived benefits, such as time efficiency, may either be exaggerated or irrelevant if people fail to sustain this type of activity.

Conclusions: Physical activity behavior change, from a public health standpoint, must involve strategies that have a good chance of being adopted by large sections of society. This is based on the premise that public health gains will be greatest if we help the least active become more active rather than the already active to do more.

S2.2 SYMPOSIUM:

The effects of web-based computer-tailored interventions targeting health-related behaviours in different population groups

Chair: Katrien De Cocker, Ghent University, Ghent, Belgium

S2.2.1

Healthy Mind, Healthy Body: A randomized trial of a computer-tailored vs interactive web-based physical activity intervention for people with depressive symptoms.

Amanda Rebar¹, Andersson Martina¹, Cody Boles¹, Nicola Burton², Mitch Duncan³, Camille Short⁴, Brenda Happell¹, Croneel Vandelanotte¹

¹Central Queensland University, Rockhampton, Australia,

²University of Queensland, Brisbane St Lucia, Australia, ³The University of Newcastle, Callaghan, Australia, ⁴The University of Adelaide, Adelaide, Australia

SIG: Yes, e- & mHealth

Awards:

Objective: Physical activity can serve as an effective primary or adjunctive treatment for depressive symptoms, but people with depression are far less likely to engage in regular physical activity than people without depression. We recently completed a randomised trial examining the effectiveness of two different web-based physical activity interventions for people with depressive symptoms.

Methods: Participants ($N = 514$) were recruited using advertisements on Facebook over 3 months and randomised to a website with mainly interactive features ('WALK 2.0') or to a website that only provided personally-tailored activity advice (MyPAA - My Personal Activity Advice).

Results: Across both groups, physical activity increased across the intervention (baseline: $M = 140.61$, $SD = 163.23$; one month: $M = 157.19$, $SD = 125.97$, three month: $M = 179.94$, $SD = 174.56$; $F[2, 1533] = 13.63$, $p < .01$, $\eta^2 = 0.03$), and depressive symptoms decreased (baseline: $M = 19.02$, $SD = 14.17$; one month: $M = 14.79$, $SD = 12.46$; three month: $M = 13.71$, $SD = 12.43$; $F[2, 1533] = 5.25$, $p = .01$, $\eta^2 = 0.01$).

Conclusions: These findings suggest there is strong potential for web-based physical activity interventions for people with depression; however drop-out rates across the study was very high (one month: 71%; three month: 82%). Further results of mixed methods analyses suggest that conventional physical activity motivation theories (e.g., theory of planned behaviour) need to be adapted to account for the special needs and motivational profiles of people with depressive symptoms.

S2.2.2

eHealth intervention to enhance physical activity: Effects of different approaches

Lilian Lechner¹, Denise Peels¹, Stijn Friederichs¹, Anke Oenema², Hein De Vries², Catherine Bolman⁰

¹Open University of the Netherlands, Heerlen, The Netherlands,

²Maastricht University, Heerlen, The Netherlands

SIG: Yes, e- & mHealth

Awards:

Objective: Computer tailoring (CT) modifies an intervention to the specific personal characteristics, needs and preferences of the individual user. However, the way CT is applied and theoretically embedded varies substantially, possibly resulting in different effects or different behavioral change processes.

Methods: Two CT interventions targeted at increasing physical activity (PA) will be presented. The *ActivePlus* intervention, targeting older adults, is based on theories such as Social Cognitive Theory, Theory of Planned Behavior and Self-Regulation Theory. In a RCT we compared the effects and behavioral change processes on PA of four versions of the intervention: an online web-based versus a print-based version and for both versions we tested the added value of supplementary environmental PA information. Further, we tested the *I Move* intervention, a web-based CT intervention aimed at increasing PA in adults, which is based on the Self Determination Theory, Self-Regulation Theory, and integrates Motivational Interviewing techniques in online CT. In a RCT we compared *I Move* to the more traditional online *ActivePlus* CT intervention, to test differences in PA effects and behavioral change processes of the more client centered *I Move* approach.

Results: All versions of the *ActivePlus* intervention were highly effective six months after baseline compared to a control group, while the print-based intervention remained effective up to one year after baseline. At six months, the *I Move* intervention proved effective in increasing PA compared to a control group. The differences in effects, as well in the behavioral change processes of both CT interventions, will be presented.

Conclusions: CT is potentially effective in increasing PA. However, different approaches can lead to substantial differences in effects as well as in behavioral change processes.

S2.2.3

Web-based, computer-tailored advice to reduce occupational sitting time: feasibility, acceptability and preliminary effectiveness among employees

Katrien De Cocker^{1,2}, Ilse De Bourdeaudhuij¹, Greet Cardon¹, Corneel Vandelanotte³

¹Ghent University, Ghent, Belgium, ²Research Foundation Flanders, Brussels, Belgium, ³Central Queensland University, Rockhampton, Belgium

SIG: Yes, e- & mHealth

Awards:

Objectives: Occupational sitting is likely to be the largest contributor to overall daily sedentary time. With adverse health effects in adults, interventions to influence occupational sitting are needed. Computer-tailoring is a relatively innovative and promising intervention approach in health promotion. However, few computer-tailored interventions in adults have targeted occupational sitting. As a result, a web-based computer-tailored advice aimed at reducing and interrupting occupational sitting was developed. The objectives of this study are to report on (1) the feasibility of reaching employees intending to request the advice, (2) the acceptability of the advice among participants requesting it, and (3) the preliminary effectiveness of the advice on occupational sitting.

Methods: Employees from a public city service (n=179) were invited to participate by e-mail. Interested employees were sent information (website link, login, password) to request the online advice. Logistic regressions were conducted to compare employees requesting the advice with those not requesting it. Two weeks after requesting the advice, a link to an online acceptability questionnaire was sent to employees requesting the advice. Descriptive statistics were used to report on the acceptability.

Results: Of the 112 employees who were interested to request the advice, 90 (80.4%) visited the website. Those with a high education were more likely to request the advice than those with low education (OR=2.4, CI=1.03 - 5.83), and those being part-time employed were more likely to request the advice compared to full-time employed employees (OR=2.9, CI=1.23 - 7.09). Of those requesting the advice, 47 (52.2%) completed the acceptability questionnaire. The majority found the advice interesting (76.6%), relevant (70.2%) and motivating (61.7%). Less employees believed the advice was applicable (31.9%). After completing the advice, 58.0% started interrupting their sitting and 32.6% was intending to do so; 14.0% started reducing their sitting and 51.2% was intending to do so.

Conclusions: It is feasible to reach employees, however more efforts are needed to reach lower educated and full-time workers. The majority of participants requesting the advice found it acceptable and reported they changed their behavior or are intending to change it.

S2.2.4

Acceptability, feasibility and effectiveness of an eHealth behaviour intervention using self-regulation: 'My Plan'

Jolien Plaete, Ilse De Bourdeaudhuij, Geert Crombez, Maïté Verloigne
Ghent University, Ghent, Belgium

SIG: Yes, e- & mHealth

Awards:

Purpose: To evaluate the acceptability, feasibility and effectiveness of an eHealth intervention that targets self-regulation processes to increase physical activity, and fruit and vegetable intake in adults.

Methods: Flemish adults were randomly allocated to the control condition or intervention condition in which they could choose to focus on physical activity (n=158), fruit intake (n=161) or vegetable intake (n=48). Of the participants that were part of the intervention condition, 194 also completed a questionnaire assessing acceptability and feasibility.

Results: The different intervention parts (questionnaires, personal advice, self-regulation part and follow-up parts) were evaluated as acceptable and feasible. Some significant differences in acceptability and feasibility scores between age groups and education levels were found. Participants with low education and participants over 40 years evaluated the personal advices and action plans as more interesting and motivating. However, these older participants also reported less that questions and answer options were clear and understandable. Participants with lower education also indicated significantly more that the personal advice was too long. At one-month follow-up, significant interaction effects were found for fruit intake ($F=9.5$, $p=0.003$) and total physical activity ($F=5.6$, $p=0.020$). Borderline significant intervention effects were found for vegetable intake ($F=3.0$, $p=0.089$) and moderate intensity physical activity ($F=2.9$, $p=0.092$). For all behaviours, the intervention group had a stronger increase than the control group.

Conclusion: The eHealth intervention 'My Plan' was evaluated as feasible and acceptable and has the potential to increase physical activity levels and fruit and vegetable intake. Although the programme is feasible for the general population, including low educated and older participants, some adaptations to the content of the intervention are needed. Furthermore, more effort are needed to motivate participants to complete the different intervention parts and follow-up measurements.

S3.2 SYMPOSIUM:

Innovative approaches to qualitative research for understanding environmental influences on active living

Chair: Cornelia Guell, University of Cambridge, Cambridge, UK

S3.2.1

Piloting photovoice and walkalong interviews to explore the impact of urban redevelopment in Glasgow

Amy Nimegeer¹, Louise Foley², Shona Hilton¹, Hilary Thomson¹, David Ogilvie²
¹University of Glasgow, Glasgow, UK, ²University of Cambridge, Cambridge, UK

SIG: Yes, Policies and environments

Awards:

Purpose: As part of a natural experimental evaluation of the travel, physical activity and health impacts of the M74 urban motorway (freeway) extension in relatively deprived communities in Glasgow, the largest city in Scotland, we piloted three methods of qualitative interviewing to generate place-based data on peoples' experience of change in the built environment.

Methods: Semistructured, walkalong, and photovoice interviews were conducted with a total of nine adult participants. Thematic analysis was performed and comparisons were drawn between methods in respect of the emerging themes as well as the experience of undertaking them.

Results: Participants were asked to consider change within their community - in general and specifically within the built environment - as well as any potential impacts that these changes may have had. Combining 'traditional' semistructured interviews with more spatially-oriented interview methods, particularly photovoice, allowed a more complex and physically oriented dataset to emerge. Although uptake of the walkalong option was poor (only one participant), it did provide participant observation-based insight into some aspects of both active travel and the built environment that the respondent found valuable (i.e. interactions with animals and young children) which had not emerged from the 'sit-down' interview. On the whole, the photovoice interviews provided a more positive account of respondents' attitudes towards their built environment, but also revealed a more nuanced representation of physical changes to the environment. Participants were also asked to reflect on their experiences of photovoice, which gave insight into why some images may have been privileged over others. Through the combination of methods, participants identified a number of recent changes within their community along with their impact and attribution.

Conclusions: The use of different methods helped to explore topics and observations that were not emergent, or not deeply explored, within the 'traditional' interview format. Although there were not enough walkalong participants to make a definitive judgement on its usefulness, photovoice helped to elicit more spatially oriented and complex data regarding the impacts of change in the built environment than the original interviews alone.

S3.2.2

Harnessing the power of 'citizen scientists' to promote active living in underserved communities using the Stanford Discovery Tool

Abby King¹, Sandra Winter¹, Lisa Goldman-Rosas¹, Jylana Sheats¹, Deborah Salvo¹, Matthew Buman², Mika Moran³
¹Stanford University, Stanford, USA, ²Arizona State University, Phoenix, USA, ³University of Haifa, Haifa, Israel

SIG: Yes, Policies and environments

Awards:

Purpose: Empowering residents to collect relevant information on neighbourhood obstacles to healthy living is a potentially powerful though under-utilised method for promoting environmental change. The Stanford Healthy Neighborhood Discovery Tool has been developed and tested by 'citizen scientists' to systematically capture neighbourhood features that promote or hinder active living and healthy eating.

Methods: The Discovery Tool is a tablet-based application that allows community residents to document neighbourhood features through geocoded photographs and audio narratives, GPS-tracked walking routes, and an embedded survey. The citizen scientists learn how to review their data, collectively identify and prioritise relevant issues to address, and advocate for realistic environmental and policy-level changes with local decision makers and other residents.

Results: Applications of the Discovery Tool-Citizen Science Engagement Model have occurred in four economically and culturally diverse communities in Northern California, a farmer's market in Arizona, a regularly scheduled 'car-free Sunday' event in San Francisco, rural regions of New York State, and diverse neighbourhoods in Mexico and Israel. Among the person-level, built environment, and policy-level changes that have occurred in response to this Engagement Model are: allocation of significant funds by a City Council in a low-income community to enhance walkability; development of an interdisciplinary neighbourhood coalition in a low-income Latino neighbourhood to address illegal dumping and trash that impeded walking; residents' evaluation of a temporary 'pop-up' park in the downtown area of an affluent community; evaluation of food access and availability by low-income residents, with 84% reporting that their participation led them to contact a local policy maker, use a new service (e.g. food stamps, shuttle service), and/or share information with a friend; plans by Mexican residents to seek solutions for stray dogs and increase neighbourhood cohesion to address neighbourhood safety concerns; and consensus-building among Israeli Jewish and Arab residents concerning environmental and community strategies to improve walkability in their neighbourhood (i.e. building multigenerational teams aimed at keeping sidewalks accessible for pedestrians).

Conclusions: Results indicate the potential effectiveness of the Discovery Tool-Engagement Model in enabling residents from diverse backgrounds to collect information that can be successfully applied in promoting healthful environmental changes.

S3.2.3

'Semistructured' ethnography with young, overweight women to explore social and environmental barriers to physical activity in the Caribbean

Miriam Alvarado¹, Cornelia Guell^{2,1}
¹University of the West Indies, Bridgetown, Barbados, ²University of Cambridge, Cambridge, UK

SIG: Yes, Policies and environments

Awards:

Purpose: Obesity and overweight are two to three times more prevalent in women than in men in Barbados, and physical inactivity is a major determinant. Using qualitative interviews and 'semistructured' participant observation in activity-defined time-bound sessions, the aim of this ethnographic study was to identify modifiable barriers to physical activity and to explore the factors that facilitate physical activity among overweight and obese women in this developing country setting.

Methods: Seventeen women aged 25 to 35 years with a BMI ≥ 25 , purposefully sampled from a population-based cross-sectional study, were recruited to participate in in-depth semistructured interviews. Twelve of these women participated in one or more additional ethnographic sessions in which the researcher joined and observed a routine activity chosen by the participant. Activities included attending a family picnic, church, and various dance classes, going to work, to parties, to the gym, golfing, swimming, and walking for transportation. More than 50 hours of ethnographic data collection were accumulated and documented in field notes. Thematic content analysis was performed on audio-recorded verbatim transcribed interviews and the typed-up field notes with the help of the qualitative data analysis software Dedoose.

Results: Social and structural barriers to physical activity were identified. Social factors related to gender norms and expectations. Women tended to be active with their female friends rather than partners or male peers, and reported peer support but also alienation. Being active also competed with family responsibilities and expectations. Structural barriers included few opportunities for active commuting and high access to cars, crowded housing with limited indoor space for activities in the home, and low perceived access to convenient and affordable exercise classes. Several successful strategies of sustained activity were observed, including walking and attending low-cost exercise groups.

Conclusions: Spending time with women in activity-defined sessions provided in-depth data on their attitudes, perceptions and practices of physical activity. While the interviews enabled the women to articulate self-identified barriers to being active such as social responsibilities, the ethnographic sessions highlighted additional barriers such as cramped homes, and provided deeper insights into where and with whom physical activity was experienced by these women.

S3.2.4

The contribution of media analysis to the evaluation of environmental interventions: the Commuting and Health in Cambridge study

Joanna Kesten^{1,2}, Simon Cohn³, David Ogilvie¹
¹University of Cambridge, Cambridge, UK, ²University of Bristol, Bristol, UK, ³London School of Hygiene and Tropical Medicine, London, UK

SIG: Yes, Policies and environments

Awards:

Purpose: Media content can increase awareness of, and shape interactions with, public health interventions. As part of a natural experimental evaluation of the travel, physical activity and health impacts of the Cambridgeshire Guided Busway, a major infrastructure project to promote sustainable transport, we analysed print and social media discourse to understand the nature of the busway and how it was experienced.

Methods: Newspaper articles published before, during and after construction of the new infrastructure were systematically retrieved from the LexisNexis database and tweets were identified from an online archive. Inductive thematic analysis was performed and comparisons were drawn between datasets.

Results: Exploring the media's discourse provided insights into the nature and experience of the busway. It elicited themes relating to the context of the busway, its dynamic nature, and the contrasts between idealised portrayals of the anticipated busway and the actual impact of the busway on the existing context and people's lived experiences. The priorities applied to different elements of the infrastructure revealed in this discourse also suggested that a lesser value was placed on promoting active travel compared with public transport. This analysis has contributed to the wider evaluation of the busway intervention, helping to understand the nature of the intervention and how it was implemented. For example, it has clarified the potential for exposure and access to the intervention and the fidelity of its implementation to vary in time and space, which has helped inform quantitative analyses of the relationships between exposure to the intervention and the study outcomes of changes in travel behaviour and physical activity. It has also shown how the intervention has become embedded and entangled within the media discourse surrounding it.

Conclusions: Media analysis provides a way of capturing and understanding the complex elements in a natural experimental study. This analysis has contributed to the wider evaluation of the busway, helping to understand its nature and implementation and informing hypotheses about how the local population interact with the infrastructure by attending to the significance of representations in the media.

S4.2. SYMPOSIUM:

Food literacy: Definitions, components, learning and links to diet and health outcomes

Chair: Anthony Worsley, Deakin University Melbourne, Australia

S4.2.1

Food literacy - what is it and does it impact on behaviour and nutrition?

Helen Vidgen
 Queensland University of Technology, Brisbane, Australia

SIG: Yes, Children and families

Awards:

Purpose: Recently, the term 'food literacy' has emerged in policy, research and practice to describe the collection of knowledge, skills and behaviours required to practically meet food needs. This presentation will describe research undertaken to empirically define the term and propose its impact on nutrition.

Methods: Two qualitative studies were undertaken. The first was a three round Delphi study of Australian food experts. Experts came from research, practice and advocacy roles in gastronomy, education, health, welfare, agriculture and retail sectors. The study sought consensus on understanding of the term, what experts perceived it should include and its relationship to food intake and diet quality. Qualitative data was analysed using constructivist grounded theory. Levels of consensus were described using descriptive statistics.

The second study was a qualitative, unstructured face to face interview with young people who were responsible for feeding themselves. Participants were aged 16-25 years. They were purposefully sampled for diversity in gender, culture and level of disadvantage. Participants were asked about their typical food intake, how they went about feeding themselves, how this differed over different households they were part of, what considered being 'good with food' and how this related to healthy eating. Results were analysed using constructivist grounded theory.

Results of both studies were then compared and data re-analysed to develop a definition and conceptual model of food literacy and nutrition. These were then extensively tested with practitioners.

Results: Food literacy is defined as a collection of interrelated knowledge, skills and behaviours required plan, managed, select, prepare and eat food to meet needs and determine intake. Food literacy is the scaffolding that protects diet quality through changes and strengthens dietary resilience over time. The concept extends beyond individual self-determinism to also apply at household, community and national levels. It is highly contextual. Food literacy influences nutrition indirectly through improving choice, pleasure and certainty.

Conclusions: This research contributes a shared understanding of food literacy through which to research and practice can be advanced.

S4.2.2

Understanding the development and maintenance of cooking and food skills and the influence of competing behavioural motivations in adults from the UK and Ireland: qualitative interview findings

Fiona Lavelle, Laura McGowan, Moira Dean
Queen's University Belfast, Belfast, UK

SIG: Yes, Children and families

Awards:

Purpose: This qualitative study was undertaken to explore people's perceptions of contemporary cooking and to enhance current understandings of the facilitators and barriers to becoming food literate (e.g. learning cooking skills, planning meals, eating healthily, shopping, etc.). Evaluating the origins of these skills and understanding the methods used to improve such skills allows for the identification of learning mechanisms and underpinning processes. From this, recommendations relating to acquiring and enhancing food literacy can be developed, with a view to improving dietary intake.

Methods: Exploratory semi-structured qualitative interviews were undertaken with males and females aged 20-60 years from the North and South of Ireland. Adults were screened based on self-reported cooking skills to ensure representation of a range of cooking skills. Verbatim transcripts were analyzed using thematic analysis and the interview schedule, based on the COM-B model, was refined iteratively through piloting.

Results: Five main themes were identified. Theme (1) 'Cooking and the role of convenience foods' related to the meaning of contemporary cooking, i.e., 'from scratch', and people's perceptions of what defines convenience products. Theme (2) 'Heuristics for cooking and food skills' highlighted the 'rules of thumb' people use when cooking, shopping, using leftovers, etc. Theme (3) 'Impact of food disasters' uncovered positive and negative outcomes of adverse cooking and food experiences, which often occurred when preparing a meal for others, and the resulting implications for behaviour. Theme (4) 'Hierarchy of cooking and food skills' illustrated how participant's perceived confidence/self-efficacy in one domain of cooking or food practices didn't necessarily translate to all related domains. Finally, Theme (5) 'Pleasure, pain and health gain' explored the competing influences of factors such as enjoyment from cooking activities and food practices, the role of creativity, economic and time-related barriers, and health motivations.

Conclusions: Results provide novel insights into the meanings of contemporary cooking and highlight the complex nature of the development and maintenance of food literacy components. Findings go beyond what is currently known in this area and provide insertion points for future studies to improve food literacy by focusing on specific cooking and food skills.

S4.2.3

Food involvement, cooking confidence and food difficulties in older age

Julia Somers, Anthony Worsley, Sarah McNaughton
Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences, Deakin University, Victoria, Australia

SIG: Yes, Children and families

Awards:

Purpose: Food literacy involves food in its many dimensions and the multifaceted relationships people have with food. Food involvement appears to be an important factor in how people engage with food. It may be of increased importance to older populations as people face barriers to food preparation and consumption with increasing age. This study examines the socio-demographic, social and motivational characteristics associated with food involvement among older Australians. Exploration of cooking confidence and food difficulties in association with food involvement illustrate the role of food involvement in domestic food production.

Methods: An Internet-based nationwide survey of 1,041 people aged 55 years and over (M = 66 years, SD 6.99) was conducted in Australia in 2012. Bell and Marshall's Food Involvement Scale was administered, along with questions pertaining to cooking confidence, food difficulties, socio-demographic, social and motivational factors. Multiple regression analyses were performed.

Results: Overall, the predictor variables explained 45% ($p < 0.0001$) of variance in food involvement. Food mavenism and pleasure motivation for food were the factors most strongly associated with food involvement ($\beta = .36$; 95% CI .46, .61; $p < 0.0001$ and $\beta = .31$; 95% CI .78, 1.08; $p < 0.0001$, respectively). The predictive ability of demographic factors was low. Men and women with low cooking confidence were less food involved. Highly food involved older adults reported specific difficulties with food, whereas low food involved respondents reported more global difficulties.

Conclusions: Cooking confidence and pleasure from food are associated with food involvement. Higher food involvement appeared to ameliorate the food difficulties experienced and therefore may be protective of health in older age. The level of food involvement should be considered when planning nutrition information and interventions for older adults.

S4.2.4

Impact of cooking and home food preparation interventions among adults: outcomes and implications for future programs

Marla Reicks, Amanda Trofolz, Jamie Stang, Melissa Laska
University of Minnesota, Minnesota, USA

SIG: Yes, Children and families

Awards:

Purpose: Cooking programs are growing in popularity; however an extensive review has not examined overall impact. Therefore, this study reviewed previous research on cooking/home food preparation interventions and diet and health-related outcomes among adults and identified implications for practice and research.

Methods: Literature review and descriptive summative method with main outcome measures of dietary intake, knowledge/skills, cooking attitudes and self-efficacy/confidence, health outcomes. Articles evaluating effectiveness of interventions that included cooking/home food preparation as the primary aim (January 1980 through December 2011) were identified via OVID MEDLINE, Agricola and Web of Science databases. Studies were grouped according to design and outcomes were reviewed for validity using an established coding system. Results were summarized for several outcome categories.

Results: Of 28 studies identified, 12 included a control group with six as non-randomized and six as randomized controlled trials. Evaluation was done post-intervention for five studies, pre- and post-intervention for 23 and beyond post-intervention for 15. Qualitative and quantitative measures suggested a positive influence on main outcomes. However, non-rigorous study designs, varying study populations, and use of non-validated assessment tools limited stronger conclusions.

Conclusions: Well-designed studies are needed that rigorously evaluate long-term impact on cooking behavior, dietary intake, obesity and other health outcomes.

S5.2. SYMPOSIUM:

Early childhood physical activity intervention research in low- and high-income settings: a case of common threads or glaring differences?

Chair: Catherine E Draper, University of Cape Town, Cape Town, South Africa

S5.2.1

Family@play: can we decrease young children's sitting time?

Trina Hinkley¹, Tony Okely², Dylan Cliff²

¹Deakin University, Melbourne, Victoria, Australia, ²University of Wollongong, Wollongong, New South Wales, Australia

SIG: Yes, Early care and education

Awards:

Objective: Young children spend the majority of their time sedentary. Given potential health and developmental implications of high levels of sitting time, identifying and implementing strategies to minimize this behaviour is essential. This study examines the potential efficacy of a family-based electronic media intervention to decrease young children's sitting time.

Methods: The randomized controlled trial randomly assigned families (child age 2.9±0.9y, 60% male; 81% high socioeconomic position) to a family-based intervention (n=12) or wait-list control (n=10) group. The intervention included weekly group sessions and support strategies. Social Cognitive and Family Systems theories underpinned program development. Parents attended 6 weekly group discussion sessions. Program content included electronic media recommendations, correlates, behaviour change processes and strategies, and relapse prevention. Weekly family-specific goals and SMS messages supported behaviour change. Sitting, stepping and standing were measured using activPAL accelerometers at baseline and follow-up. Potential efficacy was assessed by comparing between-group changes from pre- to post-intervention using regression and Cohen's *d*. To account for differences in wear time, proportion of time in sitting, upright and stepping was used.

Results: At baseline, children spent a mean of 55.2%, 30.0% and 14.7% of their time in sitting, upright and stepping postures, respectively. Across an average day, this equates to 430.5 mins, 234.0 mins, and 114.7 mins in each of the postures, respectively. Small effect sizes were observed for upright and stepping postures (*d*=0.14, *d*=0.16 respectively); however, no significant changes were evident in the percent of time children spent in those postures or in sitting following the intervention.

Conclusions: Findings from this study suggest that changing sitting, standing and stepping postures requires targeted intervention strategies. Future studies may consider including such strategies alongside those to change physical activity or electronic media behaviours.

S5.2.2

Objectively measured physical activity of rural South African preschool children: formative data for the development of a preschool intervention to promote physical activity

Simone Tomaz¹, Catherine Draper^{1,2}, Trina Hinkley³, Rachel Jones⁴
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SIG: Yes, Early care and education

Awards:

Objective: To measure the physical activity (PA) of rural South African preschool children.

Methods: Preschool children (n=131; aged 4–6 years; mean age 4.98±0.66) were recruited from five schools in Agincourt, Mpumalanga, South Africa. Each child was fitted with an ActiGraph GT3X+ to be worn for seven consecutive days (full days). Recently published, age-appropriate accelerometry cut points were used. PA behaviour of children during the preschool day (08h00 until ± 12h00) was assessed using the Observational System for Recording Physical Activity in Children-Preschool Version (OSRAC-P).

Results:

Accelerometry data (n=120 valid) indicated that on average, children spent 8.9% of their day (24 hours) in moderate- to vigorous-intensity PA (≥ 420 counts/15s) (128.2±41.1min/day). When light-intensity PA (LPA; >25 counts/15s, <420 counts/15s) was included, children spent 15.8% of the day in total PA. Steps data from the GT3X+ showed an average of 12807±2654 steps taken per day. Results from the OSRAC-P analysis during preschool time showed that children were spending 53.4% of their time being stationary and 16.5% in stationary activity involving limbs. The remainder of the preschool day was spent in LPA (6.4%), moderate-intensity PA (18.7%) and vigorous-intensity PA (3.5%). Children spent 54.6% of their time outdoors and 42.9% of their time indoors. Outdoor activities were represented by being in open space (36.1%), followed by using fixed equipment (26.8%), eating snacks (9.2%), and being in teacher-arranged outdoor activities (9.2%). Games and playing with balls represented less than 2% of outdoor activity. Children spent 83.3% of the preschool day in group-based activity, with 48.0% of all activity being facilitated by an adult. Despite this high amount of teacher-driven activity, there were almost no prompts from teachers (0.8%) to increase PA.

Conclusions:

Rural preschool children in South Africa participate in large volumes of PA, with the majority of this being unstructured PA. These findings have implications for intervening in the preschool environment to promote PA, and question the extent to which the promotion of PA should be the focus of such interventions.

S5.2.3

The effect of a kindergarten-based, family-involved intervention on objectively measured physical activity in Belgian preschool boys and girls of high and low SES: the ToyBox-study

Marieke De Craemer¹, Ellen De Decker¹, Maïté Verloigne¹, Ilse De Bourdeaudhuij¹, Yannis Manios², Greet Cardon¹, on behalf of the ToyBox study group³
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SIG: Yes, Early care and education

Awards:

Objective: The ToyBox-study developed an evidence- and theory-based intervention to improve preschoolers' energy balance-related behaviours – including physical activity (PA) – by targeting the kindergarten environment and involving their parents/ caregivers. The present study aimed to examine the effect of the ToyBox-intervention on increasing Belgian preschoolers' objectively measured PA levels, and examined differences between boys and girls from high and low socio-economic status (SES).

Methods: A sample of 472 preschoolers (4.43 ± 0.55 years; 55.1% boys) from 27 kindergartens (15 intervention, 12 control) in Flanders, Belgium were included in the data analyses. Preschoolers wore an ActiGraph accelerometer for six consecutive days and were included in the data analyses if they had a minimum of two weekdays and one weekend day, both at baseline and follow-up (one year later). Preschoolers' PA outcomes were estimated for an average day, weekday, weekend day, during school hours, and during after school hours. To assess intervention effects, multilevel repeated measures analyses were conducted for the total sample, and for sub-groups (according to sex, kindergarten levels of SES and risk groups (low levels of PA at baseline)) of preschoolers.

Results: Small intervention effects were found in the total sample. Most intervention effects were found in boys and in preschoolers from high SES kindergartens. Boys from the intervention group had an increase in vigorous PA ($\beta = 1.47$, $p = 0.03$) and moderate-to-vigorous PA ($\beta = 1.27$, $p = 0.03$) from baseline to follow-up, whereas PA levels in boys from the control group stagnated or decreased. In preschoolers from high SES kindergartens, the largest effects were found for PA outcomes during school hours and during after school hours.

Conclusions: The results from the Belgian sample demonstrate that effects of the PA-component of the ToyBox-intervention on objectively measured PA were found in preschool boys and in preschoolers from high SES kindergartens, which means that the ToyBox-intervention was mainly effective in those sub-groups. Future interventions should search for alternative strategies to increase preschoolers' PA levels in preschool girls and preschoolers from low SES kindergartens, as these are the most important at-risk groups regarding PA.

S5.2.4

From high to low: adapting an early childhood physical activity intervention

Rachel Jones¹, Tony Okely¹, Rebecca Stanley¹, Dylan Cliff¹, Eva Craig¹, Silvia Costa^{1,2}, Annalise Riethmuller¹

¹University of Wollongong, Wollongong, New South Wales, Australia; ²University College London, London, England, UK

SIG: Yes, Early care and education

Awards:

Objective: To discuss the considerations and challenges in adapting an early childhood physical activity intervention previously implemented in high-income settings for low-income settings within Australia.

Methods: In 2015/16 40 low-income early childhood education and care (ECEC) services within NSW, Australia, will participate in a multi-component physical activity intervention designed to improve gross motor skills and time-spent in moderate-to-vigorous physical activity. In 2014, the directors of the 40 low-income ECEC services completed an in-depth questionnaire relating to their service policies and practices, funding, parental engagement and demographics of children enrolled within their service. Additionally in 2014, site visits were conducted to all services and informal interviews were conducted with directors and educators. Questionnaire and interviews data were collected to, in part, inform program implementation in 2015/16.

Results: A number of considerations and challenges were highlighted, with additional considerations and challenges identified for services with high enrollment of Aboriginal and Torres Strait Islander children (approximately 50% of services). Staff turn-over, time taken to fill staff vacancies, staff and children literacy levels, availability of resources, remoteness/isolation of ECECs, family culture and structure, parental employment, availability of funding and parental engagement were key areas identified.

Conclusions: High quality early childhood physical activity interventions are urgently needed within low-income settings. However, a number of considerations and challenges need to be addressed prior to implementation to ensure success and sustainability of physical activity interventions.

S6.2. SYMPOSIUM:

Engaging fathers in childhood obesity research and prevention: Current status, recommendations and future opportunities

Chair: Kirsten K Davison, Harvard School of Public Health, Boston, MA, USA

S6.2.1

Are we doing enough to recruit and engage fathers in childhood obesity research?

Kirsten Davison, Neha Khandpur, Jo Charles
Harvard School of Public Health, Boston, MA, USA

SIG: Yes, Children and families

Awards:

Objective: This study is the first presentation in a symposium focused on the role and impact of fathers in the prevention of childhood obesity. Primary objectives of the study are to (1) examine barriers to fathers' inclusion in childhood obesity research and (2) quantify fathers involvement in food, physical activity and screen-based parenting of children age 10 years and younger.

Methods: An online survey was developed based on interviews with 13 practitioners and researchers working with fathers. With support from local and national fatherhood organizations, the survey was distributed to potential participants through websites, social networking platforms and email. Eligible participants included English speaking men living in the United States who self-identified as fathers over the age of 18 years with at least one child 10 years or younger. Differences in survey responses for fathers with and without a college degree were examined using chi-square analysis.

Results: Respondent fathers (N=304) were from diverse educational (30% < college degree) and racial/ethnic (64% white, 14% African American, 9% Hispanic, 5% Asian) backgrounds; 95% were biological fathers. Fathers overwhelmingly attributed low participation rates of fathers in childhood obesity research to "fathers have not been asked" (86%) followed by "mothers do not encourage them to participate (30%)" and "fathers are too busy" (29%). Regarding their food parenting, 70% of fathers reported eating with their child, and 45% prepared a meal or snack for their child, seven or more times a week. Few educational differences were identified. One exception was that twice as many fathers without a college degree reported that mothers did not encourage fathers' participation in research compared to fathers with a college degree (43% vs 20%, p<.001).

Conclusions: Concerted efforts are needed to directly engage fathers and invite them to participate in childhood obesity research.

S6.2.2

Initial evidence and future opportunities in engaging fathers of preschool age children in the prevention of childhood obesity

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SIG: Yes, Children and families

Awards:

Objective: This research provides initial evidence of the potential influence of fathers on their preschool age children's risk of obesity and, further investigates the current practices of and barriers faced by low-income fathers as it relates to dietary and physical activity behaviors of their children.

Methods: This mixed methods research included quantitative one-on-one interviews with fathers (n=150, 53% low-income), qualitative focus groups (n=9 groups, n=35 fathers) and, a small pilot feasibility study with low-income fathers (n=5) and their preschool age children. Anthropometric measures and previously validated questionnaires were used to assess body mass index, diet quality (Healthy Eating Index), physical activity (Pre-Physical Activity Questionnaire), child eating behavior (Child Eating Behavior Questionnaire), parental feeding style (Caregiver Feeding Style Questionnaire) and practices (Child Feeding Questionnaire). Focus group questions were grounded in social cognitive theory to determine barriers and opportunities as it related to fathers' interests and practices to prevent childhood obesity. The pilot study tested feasibility of an interactive four session community-based program including parenting, nutrition and physical activity concepts.

Results: For fathers in general, findings revealed that there were significant, positive relationships between father-child weight status ($\beta = 0.03$, $p = 0.05$), diet quality ($\beta = 0.39$, $p < 0.0001$), and weekday ($\beta = 0.27$, $p = 0.002$) and weekend ($\beta = 0.62$, $p = 0.001$) vigorous physical activity. Low income fathers reported higher perceived responsibility for child feeding ($p = 0.005$), use of pressure to eat ($p = 0.002$), rated their children higher on enjoyment of food ($p = 0.041$) and desire to drink liquids ($p = 0.001$) and, lower on satiety responsiveness ($p = 0.023$). Focus group thematic results revealed a need to improve self-efficacy as it relates to cooking and increasing physical activity, behavioral capability in increasing vegetable and water consumption and, problem solving as it relates to mealtime challenges and feeding practices. Qualitative program feedback from fathers in the pilot program was positive but father/child outcomes were not assessed.

Conclusions: With initial evidence of the influence of fathers, especially low-income fathers, on their preschool age child's risk of obesity, future rigorous interventions are needed to evaluate impact on father/child obesogenic behaviors and body weight.

S6.2.3

Engaging fathers to improve family physical and mental health: The impact of the 'Healthy Dads, Healthy Kids' community program

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SIG: Yes, Children and families

Awards:

Objective: The 'Healthy Dads, Healthy Kids' (HDHK) program was designed to engage fathers to role model and encourage healthy lifestyle behaviours to their children. Program efficacy has been established in previous RCTs. The current study reports on the HDHK community trial, which investigated whether the program would sustain its effectiveness when delivered by trained local facilitators in a large-scale rollout across the Hunter Region of NSW, Australia.

Methods: The trial used a non-randomized prospective design. In total, 190 overweight/obese fathers and 311 children participated. The programs were held in five local government areas of low-to-middle socio-economic standing, containing high proportions of blue-collar workers engaged in mining/shift-work based employment. The HDHK intervention included eight sessions and engaged fathers and children. Assessments were held at baseline, 3-month (post-test), 6-month, and 12-month, with the fathers' weight as the primary outcome. Secondary outcomes for fathers and children included waist, BMI, and dietary/physical activity behaviours. Intention-to-treat linear mixed models examined changes in continuous variables and focus groups were held with fathers (n=25), mothers/partners (n=15), and children (n=41). The qualitative analysis was conducted in NVIVO 9 using a general inductive approach.

Results: At 12 months, HDHK fathers demonstrated significant reductions in weight (-4.0kg, 95%CI -5.0,-3.0), waist circumference, and BMI. HDHK children demonstrated a significant mean reduction in BMI z-score (-0.13, -0.20,-0.05). Significant improvements were also found for physical activity/dietary behaviours. In the qualitative analysis, improvements in 'father-child bonding' and 'family bonding' independently emerged as two key themes in all groups (i.e. fathers/mothers/children). Other key themes included: 'positive family habits' (e.g. family walks, no TV during dinner) (fathers/mothers), 'positive changes in dad' (e.g. reducing screen time, playing more fun/active games) (children), and 'increases in dad's family involvement' (e.g. packing kids lunches, role in family) (mothers).

Conclusions: The HDHK program led to significant and sustained improvements in health outcomes of both fathers and their children. Encouraging fathers and children to support each other to achieve health goals may have multiple, positive flow on effects for father-child and family bonding. The trial provides long-term evidence for program effectiveness when delivered in rural communities by trained, local facilitators.

S7.2. SYMPOSIUM:

From GIS and GPS measures towards instruments for urban planning and policy making

Chair: Jasper Schipperijn, University of Southern Denmark, Odense, Denmark

S7.2.1

A framework for using GPS data in physical activity and sedentary behavior studies

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Global Positioning Systems (GPS) are increasingly applied in physical activity (PA) and sedentary behavior (SB) studies, yet significant theoretical and methodological challenges remain. In order to be able to better address these challenges in the future, we will present a framework for integrating GPS data with other technologies to create dynamic representations of behaviors in their context.

Methods:

Building upon a number of brief examples of GIS and GPS based measures of the environmental context of human behavior we will present a framework for how accelerometer, GPS and GIS can be used together. We will detail the types of outputs a researcher can expect from these data, how utilizing the technologies in tandem can produce new sets of information, and three analytical approaches that can guide researchers in analysis decisions. The relevance of the analytical approaches in urban planning and policy making will be discussed.

Results: The framework can guide researchers through conceptual development of GPS based PA and SB projects by deepening the understanding of what the data represents as well as the types of research questions that are and are not possible to answer with the data. By joining GPS data with GIS and accelerometry, a new set of research possibilities become accessible through dynamic exposure analysis, which draws on the availability of information about PA and SB as individuals move through space and time. As such, in formulating research questions utilizing dynamic measures, we propose conceptualizing interactions with the environment in three ways: temporally, spatially, and behaviourally.

Conclusions:

Combining accelerometer, GPS, and GIS data will allow for more sensitive and accurate measures of behavior in their context, both in time and in space. Having these measures will make it possible to more accurately determine which environments people are exposed to, for how long, and during which behavior. However, it will be important to delve into some of the more theoretical aspects of this research focusing on answers to questions such as what are we measuring when we measure exposure, and how does time play a role in exposure assessments for PA and SB outcomes.

S7.2.2

Collecting detailed GPS-based mobility survey data in studies combining GPS receivers and accelerometers: the RECORD MultiSensor Study

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose:

A growing number of studies have used GPS receivers and accelerometers to collect data. This protocol provides information on the spatial mobility and concomitant physical activity of participants. However, such studies usually lack systematic information on the types of activity locations visited and on the transportation modes that were used during the trips. As a consequence, studies of environmental effects on behavior are often plagued by the so-called selective daily mobility bias (due to confounding by personal preferences resulting from the fact that exposure measures also include the places specifically visited to practice the behavior). Moreover, they are unable to investigate the relationships between transportation modes and physical activity.

Methods:

In the RECORD GPS Study and RECORD MultiSensor Study, participants carried GPS receivers and accelerometers. At the end of the follow-up, the GPS data were processed with algorithms allowing us to identify the activity locations visited, some of the activities practiced at these locations, the trips between these locations, points of change of transportation modes, and the transportation modes that were used. The GPS data and derived information were automatically uploaded in a web mapping application that was used to survey the participants on all the activity locations visited and transportation modes used over 7 days. Subsamples of participants also carried other sensors allowing us to assess their body posture, their environmental exposures, and their health status.

Results:

The data collected showed that the participants spent 8.2% of their total time in transport (1h58 per day). We found that 33% of the total moderate to vigorous physical activity and 31% of the estimated energy expenditure over 7 days were attributable to transport. We found that, compared to car driving, using public transport was associated with between 200 and 300 additional steps taken and 2 and 3 additional minutes of moderate to vigorous physical activity for each 10 minutes of trip.

Conclusion:

The findings of this study illustrate the benefits of conducting a detailed GPS-based mobility survey when monitoring participants with GPS and accelerometers. We will also describe the benefits of using additional sensors in these studies.

S7.2.3

Using GIS and interactive tools to identify urban planning intervention points

Hannah Badland¹, Marcus White², Gus Macaulay³, Serryn Eagleson¹, Susanne Mavoa¹, Rebecca Roberts¹, Chris Pettit³, Billie Giles-Corti¹

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: The importance of creating walkable urban environments is widely recognised, however urban planners and policy makers need tools to objectively assess the walkability of areas. Accordingly, our purpose was to develop two neighbourhood walkability spatial tools.

Methods: The first tool is a 'walkability index'. This combines spatial measures of street connectivity, residential density and land use mix. It can be applied at user specified scales, including small administrative units, and by doing so, can estimate walkability of a given region, as well as any urban pockets which differ to the surrounding environment. Second is an open-source 'ped-catch' agent-based modelling tool and user-interface. End-users can upload various spatial data sources (e.g., street / footpath network, traffic lights, features of interest (schools, public transport stops) and manipulate these data layers using vector editing tools. Characteristics, such as walking speeds and distances travelled of the agents (pseudo-pedestrians), can be manipulated.

Results: A series of metrics and maps are generated showing neighbourhood walkability for a region, and relationships between different built environment scenarios and 'ped-catch' access can be established.

Conclusions: Walkability tools, such as the walkability index and the ped-catch, allow high and low walkable environments to be identified, different built environment scenarios to be tested for their impact on neighbourhood walkability and factors contributing to walkability to be diagnosed. These tools are accessible and cost-effective for urban designers, planners, and policy makers, and have utility for assisting the decision-making process.

S8.2. SYMPOSIUM:

Reward sensitivity and self-regulation strategies: a new scope for health promotion?

Chair: Wendy Van Lippevelde, Ghent University, Ghent, East-Flanders, Belgium

S8.2.1

How is reward sensitivity related to food intake and adiposity?

Annelies De Decker, Isabelle Sioen, Sandra Verbeken, Nathalie Michels, Caroline Braet, Stefaan Dehenaauw
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Individual differences in reward sensitivity (RS) have been positively associated with overeating and body mass index (BMI) in non-obese children, adolescents and adults. Further, RS has been positively related to fast-food restaurant visits, but only in adults. Besides the lack of research reporting a significant association between RS and highly palatable food consumption in children, the link between RS and body fat percentage (BFP) has never been investigated. However, BFP is a more accurate measure of adiposity than BMI.

Methods: Parents of 443 Flemish children aged 5.5 to 11.5 years completed a 43 item food frequency questionnaire and BIS/BAS scale for their children. BMI was calculated upon height and weight measurements. BFP was measured with air-displacement plethysmography (BODPOD®-device). Correlations and multiple linear regression analyses were conducted with RS as predictor variable, age and gender as confounders, and weekly consumption-frequency indices, BMI and BFP as outcome variables. A longitudinal data-analysis with RS as predictor and BFP as outcome will be conducted in Spring 2014.

Results: RS (measured by BAS Drive score of BIS/BAS scale) was positively associated with high-fat fast-food consumption-frequency ($p=0.049$), sweet-drink consumption-frequency ($p=0.040$), and BMI ($p=0.009$). Further, RS was positively associated with BFP in girls ($p=0.051$), but not in boys. At the congress, also results of longitudinal data-analyses will be presented.

Conclusions: RS may be a risk factor for higher consumption of palatable and energy-dense fast food in children and for higher adiposity in girls. Therefore, children with high RS may benefit from specific health promotion programs.

S8.2.2

Reward sensitivity is associated with snack and sugar sweetened beverage consumption in adolescents

Nathalie De Cock¹, Wendy Van Lippevelde¹, Leentje Vervoort¹, Lien Goossens¹, Carl Lachat^{1,3}, Lieven Huybregts^{1,4}, Steven Eggermont², John Van Camp¹
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: High intake of energy-dense snacks and Sugar Sweetened Beverages (SSBs) is a common unhealthy dietary practice among adolescents associated with several health problems such as obesity. In our current Western obesogenic environment, where these foods and drinks are omnipresent, eating behaviors are most of the time not driven by homeostasis but rather motivated by the rewarding value of food. However not all people are as sensitive to rewards in their environment, mirrored in a difference reward sensitivity (RS). RS is a psychobiological trait, which reflects the functional outcomes of the Behavioral Activation System (BAS). Not only differences between people exist, but RS also differs according to age and gender. RS is especially high in adolescence, thus the effect of RS on adolescent eating behaviors, especially relating highly palatable/rewarding foods, can be considerable. Therefore, it was aimed to investigate the association between SR and snack and SSB intake among adolescents (1) and to assess the moderation effect of gender on these associations (2).

Methods: A representative cross-sectional survey was conducted among 1104 14- to 16-years-olds (Mean age = 14.7±0.8 years; 50.9% boys; 18.0% overweight) in Flanders. Daily intakes (overall snacks, unhealthy snacks, healthy snacks, SSBs and energy and nutrients derived from snacks and SSBs) were measured by a Food Frequency Questionnaire (FFQ). RS was assessed using Behavioral Inhibition/Activation System (BIS/BAS) scales. All regression analyses were multilevel with a three-level structure (adolescent-class-school).

Results: RS was positively associated with daily intakes of SSBs (BAS $p < 0.05$), overall snacks (BAS $p < 0.01$), healthy snacks (BAS $p < 0.05$), unhealthy snacks (BAS $p < 0.001$), and energy and nutrients derived from SSBs (BAS $p < 0.01$) and snacks (BAS $p < 0.001$). Moderation effects of gender ($p < 0.05$) were found for all associations except for the relation between RS and daily intake of healthy snacks. Apart for the association of RS with fat intake from snacks, all associations were only significant in girls.

Conclusion: RS was associated with snacking and SSB consumption in adolescents, especially in girls. These findings suggest that RS should be taken into account when designing interventions to improve the snack and SSB intake of adolescents.

S8.2.3

The interplay between tempting foods and eating self-regulation in children and adolescents

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 Wageningen University and Research Centre, Wageningen, The Netherlands

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: The current food environment is characterized by easy access to and wide availability of unhealthy palatable foods. This environment places a great demand on youngsters' ability to self-regulate; that is, their ability to steer their attention, thoughts, emotions and behaviors towards larger future outcomes also when in the midst of competing options that tempts them to pursue short term rewards. The aim of the research is to investigate 1) the role of self-regulation skills in youngsters' eating behavior especially when children have easy access to foods and eating behaviors, and 2) whether exposure to tempting foods can function as a potential intervention strategy to enhance children's ability to self-regulate.

Methods: Study 1 is a cross-sectional survey among 11392 children and adolescents aged 10 to 17 from nine European countries. Study 2 is a cross-sectional survey among 2764 children and adolescents aged 10 to 17 from four European countries. Study 3 uses an experimental approach among primary school children. Children in the experimental condition are exposed to food temptations in a controlled way so that it triggers self-regulation without consumption. Children in the control condition are exposed to non-food temptations (toys). In a second phase, children do a taste test with sweets. Their consumption is monitored unobtrusively.

Results: Study 1 suggests that more use of self-regulation strategies is associated with lower intake of snacks and soft drinks. Study 2 suggests that more frequent use of self-regulation strategies did alleviate, but not eliminate, the association between easy access to snacks and soft drinks and intake of these products. Study 3 data are currently collected.

Conclusion: The findings suggest that self-regulation strategies are important in dietary intake of children and adolescents, especially in a tempting food environment. An intervention strategy is proposed to build children's ability to self-regulate when exposed to tempting foods.

S9.2. SYMPOSIUM:

Audit and evaluation of physical activity policy: An examination of developments within the food environment and their potential for guiding the future direction of physical activity policy evaluation

Chair: Adrian Bauman, School of Public Health, University of Sydney, Sydney, New South Wales, Australia

S9.2.1

Towards global benchmarking of food policies to reduce obesity and diet-related non-communicable diseases: The INFORMAS Healthy Food Environment Policy Index

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SIG: Yes, Policies and environments

Awards:

Objective: Unhealthy diets are driven by unhealthy food environments. INFORMAS (International Network for Food and Obesity/non-communicable diseases (NCDs) Research, Monitoring and Action Support) is a global network of public-interest organisations and researchers that aims to monitor, benchmark and support public and private sector actions to create healthy food environments and reduce obesity, diet-related NCDs and their related inequalities.

Methods: Monitoring areas are divided into process, impact and outcome modules. The two process modules focus on monitoring and benchmarking the implementation of key actions by governments and the private sector. The seven impact modules focus on monitoring and benchmarking key aspects of food environments, such as food composition, labelling, promotion, provision, access, availability, affordability, and trade. The extent of implementation of government policies to create healthy food environments is assessed through the Healthy Food Environment Policy Index (Food-EPI). The Food-EPI comprises a 'policy' component with seven domains to improve the healthiness of food environments, and an 'infrastructure support' component with six domains to strengthen NCD prevention systems. Good practice indicators have been proposed within each domain, and for each of those, international best existing practice exemplars are collected. A national Expert Panel of independent public health experts, including academics and representatives of NGOs and medical associations, rates the extent of government implementation of the 42 food environment policy and infrastructure support indicators against international best practice. Their ratings are informed by evidence, validated with government officials, and international benchmarks. Based on the ratings, the Expert Panel recommends concrete actions and prioritizes those according to their importance and achievability.

Results: The first Food-EPI study has been conducted in New Zealand. In addition, other countries are planning to organize such a survey in due course. The data will contribute to a global database for benchmarking food policies.

Conclusions: INFORMAS is highly original due to the 'upstream' approach taken and its direct policy relevance. The Food-EPI provides a useful set of indicators focusing on where government action is needed most. It is anticipated that assessing and benchmarking the extent of government policy implementation will increase accountability of governments for their actions on food environments.

S9.2.2

The Physical Activity Policy Audit Tool: What, where and how?

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SIG: Yes, Policies and environments

Awards:

Objective: There have been recurrent international calls for all countries to develop a national policy approach to address physical inactivity. However, there is limited evidence on the national response and what components of national policy are effective. The Policy Audit Tool (PAT) was developed to provide a standardized instrument to assess national policy approaches to physical activity and to facilitate the sharing of examples and experiences. Structured in four sections, PAT comprises 27 items covering presence and content of policies across multiple sectors, targets and surveillance and policy implementation at national and local level.

Methods: PAT was developed and tested in seven European countries during 2009-12 (Finland, Italy, the Netherlands, Norway, Portugal, Slovenia and Switzerland) and implemented in 22 Countries in Eastern Mediterranean Region in 2013-2014. In each country a primary contact person led the country level data collection, ideally with support from a multi sector project team. Country data collection took between 3-12 months.

Results: PAT completion requires consultation with key stakeholders across multiple sectors to gather information from a wide range of sources. Engagement of government and non-government agencies is desirable to access essential information and collect insights from different perspectives. A multi-step iterative process is most effective. The completed PAT provides a comprehensive overview of the current status of a countries policy context, gaps and opportunities for the promotion of physical activity.

Conclusions: The PAT instrument provides a structured assessment tool and process for individual or groups of countries to assess their current policy actions. The findings can underpin and inform future policy development and implementation. The PAT process itself and the results can raise the priority of physical activity and stimulate cross sector engagement and future partnerships. The international comparison process provides useful insights and examples which can benefit both regional and global agenda. These results have informed improvements to the tool to produce PAT Version 2.

S9.2.3

Applying the INFORMAS framework to physical activity policy.

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SIG: Yes, Policies and environments

Awards:

Objective: Physical activity systems and how they operate globally, nationally and locally need to be understood in order to provide healthy physical activity environments. INFORMAS (see oral 2 for details) offers a framework to monitor, benchmark and support public and private sector actions to create healthy physical activity environments, reduce obesity and inactivity-related NCDs. This presentation will outline the value of applying the INFORMAS framework to physical activity and present a plan for establishing a global network to achieve this.

Methods: A rapid review of physical activity policy evaluation, GAPA's identified seven investments that work² and the indicators proposed for the monitoring and implementation of the European Union physical activity guidelines has led to the development of an INFORMAS prototype Physical Activity – Environment Policy Index (PA-EPI, policy component only). This prototype needs further development and based on INFORMAS the following steps are now proposed:

1. Convene an expert group to discuss the prototype PA-EPI presented and further use of the INFORMAS monitoring framework, identify module leaders and establish initial consensus on the physical activity systems to be monitored.
2. To investigate different approaches (e.g., WHO) for strengthening health systems to outline the infrastructure support for physical activity policy implementation (7 domains, e.g. leadership, Governance, health-in-all-policies).
3. Expert Group Meeting. To formalise the monitoring framework, publication of a special edition. Module leaders to present a 'White Paper' on one of the respective domain statements of good practice for a Government Healthy Physical Activity Environment Policy Index (PA-EPI).
4. Agree on a step-wise approach to monitoring.

Conclusion: INFORMAS has potential to be applied to physical activity policy and environments. As with diet, the development of Physical Activity Environment Policy Index could provide a useful set of indicators focusing on where government action is needed most to facilitate physical activity promoting environments.

S1.3. SYMPOSIUM:

Determinants of sedentary behaviour across the life span: a DEDIPAC symposium

Chair: Greet Cardon, Ghent University, Ghent, Belgium

S1.3.1

Systematic review of determinants of sedentary behavior in children: a DEDIPAC study

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose:

In children and adolescents, strong evidence of a relationship between sedentary behavior (SB) and obesity is found. Moderate evidence was observed for blood pressure and cholesterol, self-esteem, social behavior problems, physical fitness and academic achievement. Therefore, identifying determinants of SB in children is important for future interventions addressing these health concerns.

Methods:

A systematic literature review of determinant studies on SB in children (< 18 years old), published from January 2000 to May 2014 was conducted. Studies were selected from searches in Pubmed, Embase, CINAHL, PsycINFO and Web of Science. The search strategy was based on four key elements: (a) sedentary behavior and its synonyms (e.g. sedentariness); (b) determinants and its synonyms (e.g. correlates, factors); (c) types of sedentary behavior (e.g. TV viewing, gaming) and (d) possible determinants of sedentary behavior (e.g. environmental, behavioral and socio-demographic). Terms referring to these four elements were used as MESH-headings and title or abstract words in all databases. Only English studies reporting longitudinal results on SB related factors were included. Studies focusing on patient groups, reviews and cross-sectional studies were excluded.

Results:

After full text screening of the 2323 articles resulting from the systematic database search, 499 articles were selected of which 475 studies were excluded because of their cross-sectional design or because they were reviews. From the remaining selection of 24 studies, 11 studies were conducted in Europe, 8 studies in North America and 5 studies in Australasia. Determinants investigated belonged to different categories: demographics and biological, physical, psychological and behavioral, social and cultural, and environmental. Age, gender, SES, ethnicity, pubertal timing, fat mass index, maternal encouragement to be active, depressive symptoms, feeling of social exclusion, and school characteristics were found to be significant determinants of SB in children.

Conclusions:

A large number of studies investigated factors related to SB in children cross-sectionally. Only 24 studies used a longitudinal design in which different measurement instruments (mostly questionnaires) were used. The individual, behavioral and environmental variables which determined SB in children, provide an insight into the modifiable variables that could form the focus of interventions targeting the reduction of SB in children.

S1.3.3

Systematic review of determinants of sedentary behaviour in adults (aged 18-65): a DEDIPAC study

Grainne O'Donoghue¹, Chantal Simon², Julie Anne Nazare⁶, Keitly Mensah², Greet Cardon³, Jeroen Lakerveld⁴, Nanna Lien⁵, Donal O'Gorman¹

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SIG: No, this communication does not fit in any of the SIGs

Awards:**Purpose:**

Even when adults meet recommended physical activity guidelines, sitting for prolonged periods can be hazardous for metabolic health. New evidence identifies relationships of too much sedentary time with overweight, obesity, type II diabetes and cardiovascular disease. In an attempt to reduce sedentary behaviours we need to understand what factors are at least associated with such behaviours. This requires multiple perspectives covering potential socio-demographic, biological, psychological, social and cultural, behavioural, and environmental influences. The aim of this review is to identify, define and map life course factors associated with SB in adults (18-65 years).

Methods:

Pubmed, Embase, CINAHL, PsycINFO and Web of Science databases were searched for English language articles published from January 2000 until May 2014. The search strategy was based on four key elements: (a) sedentary behaviour and its synonyms (e.g. sedentariness); (b) determinants and its synonyms (e.g. correlates, factors); (c) types of sedentary behaviour (e.g. TV viewing, gaming) and (d) possible determinants of sedentary behaviour (e.g. environmental, behavioural). Articles whose primary outcome focuses on specific patient groups / pathology were excluded. The full review protocol is available from PROSPERO (PROSPERO 2014:CRD42014009823).

Results:

Forty seven studies were identified out of 4473, with sample sizes ranging from 10 to 92,234. Thirty nine were cross sectional, 6 followed a prospective design, one experimental and one qualitative. Sedentary behaviour was primarily measured as TV viewing, screen time and sitting time. In 10 of the 47 studies, objectively measured sedentary time was also reported; accelerometry (n=9) and heart rate (n=1). Factors investigated in order of frequency were socio-demographics, environmental, behavioural, biological, psychological, occupational and cultural variables. Evidence was present for SB and correlates of education, income, employment status, physical environment, cultural influence, exercise levels, attitudes and beliefs and depressive symptoms.

Conclusion:

Studies have identified numerous factors associated with sedentary behaviour. However, research in this important emerging field needs to be extended beyond these initial cross sectional studies. Prospective studies, human experimental work and interventional trials addressing the identified factors are fundamental in the quest to decrease sedentary behaviours and improve overall health.

S1.3.4

Systematic review of determinants of sedentary behaviour in older adults: a DEDIPAC study

Sebastien Chastin¹, Christoph Buck², Ellen Freiburger³, Greet Cardon⁴, Jean Michel Oppert⁵

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SIG: No, this communication does not fit in any of the SIGs

Awards:**Purpose:**

Older adults are the most sedentary segment of society and high sedentary time is associated with poor health and wellbeing outcome in this population. Identifying determinants of sedentary behaviour is a necessary step to develop interventions to reduce sedentary time.

Methods:

A systematic literature review was conducted to identify life course factors associated with sedentary behaviour in older adults. Pubmed, Embase, CINAHL, PsycINFO and Web of Science were searched for articles published between 2000 and May 2014. The search strategy was based on four key elements: (a) sedentary behaviour and its synonyms; (b) determinants and its synonyms (e.g. correlates, factors); (c) types of sedentary behaviour (e.g. TV viewing, sitting, gaming) and (d) types of determinants of sedentary behaviour (e.g. environmental, behavioural). The full review protocol is available from PROSPERO (PROSPERO 2014:CRD42014009823). Articles were included in the review if specific information about sedentary behaviour in older adults was reported. Studies on samples identified by disease were excluded.

Results:

22 studies were identified out of 4473 returned by the systematic search. These included 18 cross-sectional, 2 longitudinal, 1 correlation and 1 qualitative studies, all conducted after 2011. Factors investigated in quantitative studies included in order of frequency; obesity markers (eg BMI or weight status), demographics, educational level, employment/retirement status, quality of life, physical activity levels, living arrangements, musculoskeletal health, income, anxiety, depression, cognitive function, disease burden, religious belief. Of those, only age, gender, BMI, marital status, education level and living arrangements were found to be significantly associated with sedentary time. The relationship between physical functioning and sedentary behaviour appears non-linear. Qualitative evidence were found for pain, fatigue, mobility issues, ageist stereotypes, lack of resting places in the environment, lack of opportunity to engage in non-seated activity.

Conclusion:

Few studies have investigated determinants of sedentary behaviour in older adults and these have to date concentrated mostly on personal factors. Findings from quantitative studies are different from those of qualitative investigation and point to non-linear and complex inter-play between proximal and distal factors. More longitudinal studies are needed and future studies should consider including qualitative work to inform their design.

S2.3. SYMPOSIUM:

Walking to physical and mental health: latest evidence and next steps for action

Chair: Elaine M Murtagh, Mary Immaculate College, University of Limerick, Limerick, Ireland

S2.3.1

Is walking the nearest activity to perfect exercise? Associations, prevalence and patterns of walking across the life-course

Charlie Foster¹, David Roberts¹, Sarah Payne², Nicholas Townsend¹, Paul Kelly³

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective: To present a meta-analysis for walking, as an independent risk factor for all-cause mortality, and examine patterns of walking for children, young people and adults from national survey data.

Methods: We performed a meta-analysis of data from prospective cohort studies, with reported exposure measures of regular walking at baseline, with outcomes for all-cause mortality rates adjusted for other physical activity. We identified pattern of walking from self-reported physical activity and walking data from the Health Survey for England (HSE) 2008 for children and adults, and HSE 2012 for adults. We analysed data from 1,110 children aged 5–15 years who reported meeting the UK physical activity recommendations. We calculated the proportions of total physical activity achieved in various domains of activity and examined associations with age, gender and socioeconomic status. We produced a physical activity and walking profile for 8,158 adults and examined profiles by gender, age, and SES indices (Index of Multiple Deprivation). We also combined HSE 2008 and 2012, and constructed multivariate logistic and linear regression models to assess if odds of meeting UK recommendations, and mean minutes of PA and walking had changed between 2008 and 2012.

Results: Our random effects meta-analysis of the point estimates for the 14 walking studies (280,000 participants and 2.6 million person-years of follow up) found a reduced risk of all-cause mortality of 0.89 (95% CI = 0.83 to 0.96). Walking increased for both boys and girls by age groups ($\rho = 0.257$; $p < 0.001$), with most walking reported by girls in highest areas of deprivation. In adults we found differential patterns of walking by gender, age and inequalities with no change in walking levels from 2008–2012.

Conclusions: Shifting groups of non-walkers to walking and maintaining the walking of walkers across all ages will contribute to a reduction in mortality at a population level, but without a deeper understanding of possible differential patterns of walking across age, gender and social groups, walking interventions might maintain or increase potential health inequalities.

S2.3.2

Prevalence of walking in adult women, and prospective associations with health and well-being in older age

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Objectives: To examine the prevalence of physical activity (PA), and the contribution of walking, across the adult lifespan in Australian women, and to describe prospective relationships between walking and health outcomes in older age.

Methods: Participants were from the young (born 1973–1978; N=9,000), mid-age (1946–51; N=10,000) and older (1921–1926; N=6,000) cohorts of the Australian Longitudinal Study on Women's Health. They reported weekly activity (sum of walking, moderate and vigorous minutes) and indicators of health status at approximately 3 year intervals from 1999 to 2012 (when they were 22 to 39, 47 to 64 and 73 to 90 years old). Linear and logistic mixed models, adjusted for socio-demographic, behavioural and health-related variables, were used to examine associations between walking and SF-36 scores, Geriatric Anxiety and Depression scores (GADS), and osteoarthritis (OA) in the older cohort.

Results: From age 22 to 39, between 85% and 90% of the younger women reported doing some activity and approximately 57% of total activity was attributable to walking. From age 50 to 64, just over 80% of the mid-age cohort reported some activity, of which about 67% was walking. More than two thirds of 73 year olds reported some activity; this fell to 45% by age 90. During this time, the contribution of walking remained constant, at about 62%. Prospectively, there were significant positive dose-response relationships between walking and physical functioning and vitality in the older women, and inverse dose-response relationships between walking and both GADS scores and OA. Health benefits in women who reported only walking were similar to those seen in women who reported a range of activities.

Conclusion: Walking contributes significantly to overall PA in women across the lifespan. In older women, greater amounts of walking are associated with better future health-related quality of life, (particularly physical functioning and vitality), improved mental health and reduced risk of OA. Even if walking is their only activity, those who walk have better health as they age.

S2.3.3

What is the effect of walking on cardiovascular disease risk? Evidence from 30 years of randomised control trials

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective: To perform a meta-analysis of randomised controlled trials that examined the effect of walking interventions on risk factors for cardiovascular disease and thereby provide a synthesis of the effects accruing when inactive adults undertake a walking programme.

Methods: Four electronic databases (PubMed, Web of Science, ScienceDirect and the Cochrane Central Register of Controlled Trials) and reference lists were searched (Jan 1971–June 2012). Two authors identified randomised control trials of interventions ≥ 4 weeks duration that included at least one group with walking as the only treatment and a no-exercise comparator group. Participants were inactive at baseline. Pooled results were reported as weighted mean treatment effects and 95% confidence intervals using a random effects model. Heterogeneity was evaluated using the I^2 statistic. Meta-regression analyses were conducted to assess whether heterogeneity could be explained by age, baseline weight, gender or duration of intervention. Publication bias was appraised by Egger's test. Risk of bias was assessed using the Cochrane Collaboration assessment tool.

Results: 32 articles reported the effects of walking interventions on cardiovascular disease risk factors. Walking increased aerobic fitness (3.04mL/kg/min) and reduced systolic (-3.58mmHg) and diastolic (-1.54mmHg) blood pressure. Walking also improved several measures of adiposity: waist circumference (-1.51cm), weight (-1.37kg), percentage body fat (-1.22%) and body mass index (-0.53kg/m²). A significant treatment effect was not observed for any blood lipid parameters. Significant heterogeneity (I^2 statistic) was noted for aerobic fitness, BMI, weight and body fat percentage. Meta-regression analyses found that studies of only female participants had a greater overall treatment effect on weight than those studies including some male participants. Publication bias was evident for body mass index, weight and waist circumference. Most studies did not provide sufficient information to make firm judgements about risk of bias.

Conclusions: Despite the limitations noted above, there is overwhelming evidence that walking dramatically improves risk factors for cardiovascular disease. Future research should address issues in relation to heterogeneity and risk of bias within and across studies. The results underscore the central role of walking in the primary prevention of cardiovascular disease.

S2.3.4

Combining music and mobile technology to promote health-enhancing walking

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SIG: Yes, e- & mHealth

Awards:

Objective: To describe a program of research investigating the use of music and mobile technology to promote walking at a "healthy" pace.

Methods: Android and iOS mobile phone apps were developed for use during walking behaviour change interventions. All apps combined a) monitoring walking pace, b) provision of an auditory signal, and c) providing feedback either during or after the walk. Several studies evaluated the effectiveness of the apps at assisting maintenance of a healthy walking pace. Primary outcome measures were walking pace and discrepancy between actual pace and "prescribed" pace. Three primary research questions were asked: RQ1) Can adults match their walking pace to the tempo of an auditory signal? RQ2) Can walking pace be manipulated by changing music tempo, and do characteristics of the audio signal influence the effectiveness of tempo manipulation? RQ3) Can music signal degradation be used for training a healthy walking pace?

Results: RQ1: From several studies of healthy and clinical participants of varying ages ($N = 146$), we determined that most adults could walk within ± 5 steps per minute of a prescribed "healthy" pace by matching auditory signal tempo, regardless of whether a simple metronome signal or music stimulus was used. RQ2: In two subsequent studies we found that adults ($N = 48$) were able to adjust walking pace to changes in music tempo, regardless of the pulse clarity, or whether changes were of sudden or smooth onset. However, without specific instructions, music tempo did not influence walking pace. RQ3: Pilot testing of a novel music-degradation app indicated that it is effective at helping adults ($N = 27$) to maintain a healthy walking pace, without needing to match the tempo of a prescribed music set, and that this training effect was maintained after withdrawal of the music stimulus.

Conclusions: This series of studies demonstrated the effectiveness of music-based mobile phone apps at helping adults to maintain a healthy walking pace, which could be used within real-world walking behaviour change interventions. The music degradation app is especially promising as it allows much greater flexibility in music choice.

S3.3. SYMPOSIUM:

Evaluating the impact of changes to the food environment on diet or health outcomes

Chair: Lukar E Thornton, Deakin University, Burwood, Victoria, Australia

S3.3.1

Investigating the impact of a new fast food development on residents' eating behaviours using a natural experiment study design

Lukar Thornton, Kylie Ball, David Crawford
Deakin University, Burwood, Vic, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: A common basis for opposition to the development of new fast food outlets is the claim of negative health impacts; however, causal evidence remains scarce. This study aims to assess the impact of a new fast food (McDonald's) development on the eating behaviours and perceptions of local residents using a natural experiment design.

Methods: The site for this study was Tecoma, Australia, a small town on the outer fringe of Melbourne. Prior to the new store, the nearest McDonald's outlet was approximately 8km away. Baseline data was collected in December 2012 on eating behaviours and perceptions of the local environment among 242 Tecoma residents and 183 residents from a nearby control site (Monbulk). Three month follow-up data was collected in July 2014 (Tecoma n = 227; Monbulk n = 164). Follow-up data from one year after the opening is scheduled to be collected in April 2015.

Results: At baseline, around 80% of residents from both sites reported that they had not eaten McDonald's products during the last month; even higher proportions reported not eating other fast foods (e.g. ~90% for KFC and Hungry Jacks). Residents from both towns reported that they believed that their town did not have a lot of rubbish/litter, had only low to moderate levels of traffic, and was an attractive place to live. Results from the 3 month follow-up suggest little change in the eating behaviours or perceptions reported by the residents.

Conclusions: Natural experiments have been proposed as a priority area for food environment research. Evidence generated from this controlled study suggests no impact of a new fast food restaurant development on the eating behaviours and perceptions of local residents in the 3 months after opening.

S3.3.2

A natural experiment to increase healthy food access in a South Carolina food desert: Baseline characteristics of the Food Access and Family Food Shopper Study

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University of South Carolina, Columbia, SC, USA

SIG: Yes, Policies and environments

Awards:

Purpose: The scarcity of healthy food outlets in disadvantaged communities has influenced local and national policy to increase spatial access, but little evaluation research has been conducted. The Food Access and Family Food Shopper Study was designed to evaluate the impact of opening a food hub in a food desert on residents' dietary intake and quality, energy intake, weight, perceived food environment, and food shopping behavior. This presentation will focus on the study's design, participant characteristics and environment at baseline.

Methods: The Food Hub will open in the Upstate of South Carolina (SC) in fall 2014. It will include an urban farm, farmers' market, grocery store, cafe, mobile market truck, community gardens, food assistance "double value" incentive program, community education, and a culinary job training program. In the year prior to the Food Hub's opening, we collected data on dietary intake, weight, food environment perceptions, food shopping behaviors, and food security status for the quasi-experimental study. 269 residents were recruited in the food hub community and 263 in a matched comparison community (all designated as food desert census tracts). We also conducted a comprehensive field census of the food retail environment using GPS.

Results: Our combined study population largely comprised women (80%) of African American race (92%) with a mean age of 50. More than 30% had not completed high school and for 38% high school was the highest educational degree. Almost half (46%) had an annual income below US\$10,000, 64% received food stamps in the past year, and 62% reported being food insecure. Participants traveled 2.6 miles to the most frequented store at which they shopped 1.2 times per week and 51% did not travel in their own car. 52% of participants indicated that lack of access to adequate food shopping was a problem.

Conclusion: Despite working in communities of high poverty with multiple barriers to participation, this study successfully met enrollment goals and established new community research partnerships prior to the opening of the Food Hub. Follow up of the Food Hub community and comparison community in 2015 and 2016 will shed light on the Food Hub's impact.

S3.3.3

Assessment of healthy food availability in small- to mid-sized retailers participating in the Supplemental Nutrition Assistance Program (SNAP) in the U.S.: The need for supply-side policies to help improve dietary quality among low-income customers.

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University of Minnesota, Minneapolis, MN, USA

SIG: Yes, Policies and environments

Awards:

Purpose: In the US, the federal government has the authority to institute minimum stocking criteria, including specific types and quantities of healthy foods, for food stores participating in federal low-income nutrition assistance programs, like the Supplemental Nutrition Assistance Program (SNAP). Increases in healthy food access that would result from such requirements could support improvements in dietary quality among low-income SNAP customers, as well as all customers shopping in these venues. The overall purpose of this study was to quantify the extent to which healthy foods are currently being stocked in small- to mid-sized SNAP-authorized retailers, as a means of examining the potential impact of such a policy change.

Method: Audits were conducted in 2014 in randomly selected, licensed food stores in Minneapolis and St. Paul, MN, USA. Stores that were excluded from this study were: supermarkets, retailers participating in WIC (Special Supplemental Nutrition Program for Women, Infants, and Children, a federal nutrition assistance program that already has stocking requirements for healthy foods), stores with $\leq 100\text{ft}^2$ retail space, those located downtown or in specific market areas, and specialty stores. Availability of milk, fruits/vegetables, beans, lentils, eggs, nut butter, canned fish, and whole grain-rich foods was assessed. Adequacy supply criteria were based on WIC federal stocking requirements for 10 food categories.

Results: Stores ($n=91$) included corner stores, small groceries, food-gas marts, dollar stores and pharmacies. More than half carried foods like fat-free/low-fat milk, fresh or canned fruit, and whole grain-rich cereal; however, only 31% stocked fresh vegetables. Furthermore, few stores stocked adequate quantities of these foods. For example, 64% stocked fat-free/low-fat milk but only 35% stocked enough to meet the adequacy criteria. Only 20% of stores met the adequacy criteria for produce.

Conclusions: Many stores did not carry sufficient quantities of healthy foods. The US government should improve stocking requirements so SNAP-participating stores are required to carry minimum quantities of healthy foods. Given that the 2014 US federal Farm Bill mandated other changes to stocking requirements for SNAP retailers, these recommended changes could be readily made within the next year. Similar policies may be important for consideration in other countries as well.

S3.3.4

Longitudinal study of supermarket accessibility and BMI in a nationwide sample of over 3.1 million U.S. adults

Shannon Zenk¹, Elizabeth Tarlov¹, Lisa Powell¹, Stephen Matthews², Coady Wang³, Kelly Jones¹
¹University of Illinois at Chicago, Chicago, IL, USA, ²Pennsylvania State University, College Park, PA, USA, ³Indiana University, Bloomington, IN, USA

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Considerable research has examined associations between the residential food environment, particularly the accessibility of supermarkets, and adult body weight. However, few studies are longitudinal. The Weight And Veteran Environments Study (WAVES) is a retrospective longitudinal study of U.S. adults followed over 7 years that will determine specific attributes of the residential environment that help individuals maintain a healthier BMI and metabolic risk status. Important strengths of WAVES are inclusion of adults residing in diverse environments nationwide, health information from an electronic health record, and precise home address information for the creation of "egocentric" (rather than administrative area-based) environmental exposure measures. Leveraging the longitudinal data structure, in this analysis we will estimate effects of supermarket openings and closings as well as effects of moving closer to a supermarket on change in BMI over time.

Method: Using a retrospective longitudinal design, this analysis is linking electronic health record data on individuals' BMI to commercial data on supermarket locations near their homes. The population is U.S. military veterans aged 20-80 who received U.S. Department of Veterans Affairs health care between 2008-2013 and were community-dwelling and ambulatory at the time of the index primary care visit. Supermarket accessibility is measured as a density of supermarkets within 1, 3, and 5 miles of their homes. Covariates include individual- and neighborhood-level demographics, chronic health conditions, and geographic region. Relationships will be estimated using generalized difference-in-difference models.

Results: After exclusions, the study cohort is comprised of over 3.1 million individuals who are predominately male (93.2%), 16% black or Hispanic, and with a mean age of 58.1 years ($SD=14.2$). Preliminary results suggest, for example, that between 2008 and 2013 29.6% of individuals' neighborhoods (3-mile buffer) had a net gain of ³¹ supermarkets, 27.5% lost ³¹ supermarkets, and 42.9% had no net change. Individuals in urban, majority black, and majority Hispanic neighborhoods were more likely to gain a supermarket. Results of the longitudinal analysis will be presented.

Conclusions: This longitudinal study will provide more robust evidence upon which to formulate and refine policies, such as the Healthy Food Financing Initiative, aimed at addressing the high prevalence of obesity.

S4.3 SYMPOSIUM:

Small effects and 'negative' trials. Lessons learned and insights for future trials of diet and physical activity interventions in pregnancy and the postpartum.

Chair: Sharon A Simpson, University of Glasgow, Glasgow, UK

S4.3.1

The HELP trial: Insights from process evaluation and suggestions for future research.

Sharon Simpson¹, Elinor Coulman³, Dunla Cassidy³, Becky Playle³, David Cohen², Mirella Longo², Chao Huang³, Karen Jewell⁴
¹University of Glasgow, Glasgow, UK, ²University of South Wales, Pontypridd, UK, ³Cardiff University, Cardiff, UK, ⁴Cardiff and Vale University Health Board, Cardiff, UK

SIG: Yes, Children and families

Awards:

Purpose: The purpose of the study was to test an innovative theory-based weight management intervention for obese pregnant women, which targets physical activity and healthy eating. Alongside the trial we used a novel approach developing a logic model describing the intervention theory which informed the development of a detailed process evaluation framework.

Methods: This cluster RCT recruited 598 pregnant women across 20 maternity units. Women in the intervention group were invited to attend a weekly weight management group. Control participants received usual care. Women were followed up at 36 weeks gestation, 6 weeks, 6 months and 1 year postpartum. The primary outcome was BMI at 1 year postpartum. A number of secondary outcomes were collected and a health economic evaluation was also conducted. As part of the process evaluation we collected both quantitative and qualitative data including 61 qualitative interviews with women in the trial and 3 focus groups with intervention staff. These were analysed using a thematic analytic approach. We also completed mediation analyses to test our intervention theory.

Results: There was no significant difference in BMI between groups at one year postpartum (-0.02 , 95% CI $[-0.04-0.01]$; $p=0.17$). Findings from the process evaluation indicated that there were adherence issues, as about 1/3 of the intervention did not attend any group sessions; there were implementation issues at some sites particularly in relation to the physical activity element; there may have been some impact of measurement at follow-up and potential contamination; the impact of women's changing priorities post[S.A.S1] -partum may have meant a 12 month primary outcome point was over optimistic and finally further on-going support may be required post-partum. There was no mediation effect of hypothesised mediators although the qualitative data offered insights into mechanism of effect of the intervention.

Conclusions: The intervention does not appear to lead to lower BMI at one year postpartum. The process evaluation offered insights on the non-significant effect of the trial intervention as well as the theoretical basis of the intervention. Using logic modelling to explicate theory and inform process evaluation is a useful method.

S4.3.2

An Online Healthy Lifestyle Intervention for Pregnant Women Is Not Appropriate for Women of All Weights and Incomes: Insights from the e-Moms Roc Process Evaluation

Christine M Olson¹, Myla S Strawderman¹, Meredith L Graham¹, Susan Groth², Diana I Fernandez²
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SIG: Yes, Children and families

Awards:

Purpose: To explain the significant negative effect of an integrated mobile phone and online healthy lifestyle intervention during pregnancy on weight gain among obese, higher income women.

Methods: Intervention development was guided by the Integrative Model of Behavior Prediction and Fogg's Behavior Model for Persuasive Design. Effectiveness was tested in a 3-arm RCT with pregnant women with normal, overweight, and obese class 1 body mass indices (BMI) and low and higher household incomes. Two arms received a mobile phone and online healthy lifestyle intervention during pregnancy. Data on diet, physical activity and psychosocial variables were collected through online surveys. Weight and medical data were collected through a medical record audit. Use of intervention features was automatically logged by the website. A subsample of 1,335 randomized, eligible, and participating women from the original 1,689 randomized are analysed here.

Results: Overall the intervention had no significant effect on risk of excessive pregnancy weight gain (OR = 1.11; $p = 0.42$); however, it had a significant negative effect in higher income, obese women (OR = 3.16; $p = 0.01$). Process evaluation showed consistent use of the weight gain tracker among higher income women was significantly and positively associated with a better outcome in normal ($p=0.03$) and overweight ($p=0.002$) BMI intervention women. It was not in obese women ($p=0.79$), making it an unlikely explanation for their excessive weight gain. In addition, 18% of higher income, obese women were misclassified at screening by BMI group and consequently advised to gain too much weight. With their removal from the analysis, the OR decreased to 2.48 ($p = 0.08$) indicating that this is only a partial explanation. A third explanation is that the obese women are significantly ($p < 0.01$) more likely than normal BMI women to be restrained eaters. This trait was associated with excessive gain and may have caused misperceptions of intervention features.

Conclusions: While online interventions aimed at preventing excessive pregnancy weight gain have broad reach, their effect sizes are small and vary by BMI. For higher income, obese women, some intervention features may not be appropriate or may need specific tailoring for this group.

S4.3.3

Qualitative investigation of maternal attitudes to adopting healthy lifestyle behaviours in pregnancy and self-managing gestational weight gain for improved pregnancy outcome.

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¹University College Dublin, Dublin, Ireland, ²University College Cork, Cork, Ireland

SIG: Yes, Children and families

Awards: No

Purpose:

Many healthy lifestyle interventions in pregnancy have failed to produce significant, if any, positive outcomes. However, few studies have considered maternal perspectives towards the importance of healthy behaviours during this critical life stage, or the perceived barriers to implementing behaviour changes. Two qualitative studies were conducted alongside the ROLO and PEARs RCTs to explore these maternal attitudes to healthy lifestyle behaviour change and gestational weight gain (GWG) which could better inform future intervention studies and healthcare professionals' care of pregnant women.

Methods:

The first study was a postpartum qualitative exploration of maternal attitudes to GWG among 21 second-time mothers who had attended the National Maternity Hospital, Dublin. The second study was an antenatal qualitative investigation of 28 pregnant women with BMI $\geq 25\text{kg/m}^2$ attending the same hospital, regarding the factors they perceived to influence their food choices and physical activity behaviours. Both studies conducted audio-recorded, individual, semi-structured interviews with participants and employed inductive thematic analysis.

Results:

Both studies recognised that second-time mothers were more concerned about weight gain in pregnancy primarily due to difficulties regarding postpartum weight loss, rather than effects of excess GWG on the foetus. Physical discomforts, fatigue and time constraints were frequently reported as barriers to physical activity, while enjoyment and social support helped facilitate healthy activity behaviours. Food choices were influenced by internal preferences and cravings which women believed were meeting their babies' needs, although it may have led to over-eating for some women. Environmental factors such as food salience, obesogenic environment and socio-economic background also influence women's food choice trajectories and physical activity behaviours.

Conclusions:

Social support from family, friends and healthcare professionals would help pregnant women to effectively implement healthy lifestyle behaviours. Understanding the time-constraints of women that are working or already have children is important. Tailored advice is required on efficient and convenient methods for integrating healthy eating and exercise into their routine daily habits. Education on the short and long-term impact of excess GWG and poor eating and activity habits on the offspring may improve women's motivation to adopt healthy behaviours in pregnancy.

S4.3.4

Insights from the LIMIT randomised trial: how process evaluation might help understand "negative" results in a large RCT.

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SIG: Yes, Children and families

Awards:

Purpose:

Antenatal dietary and lifestyle interventions offer a unique opportunity to improve health for women and their infants, with pregnancy considered by many to be a "teachable moment" in improving the health of women and their families. In the context of a large RCT examining the effect of a dietary and lifestyle intervention on maternal and infant outcomes for overweight and obese pregnant women, we conducted two nested cohort and qualitative studies addressing different aspects of process evaluation. The aims were to firstly, assess in early pregnancy, women's awareness and knowledge of risks associated with high BMI, in addition to their self-reported willingness to change behaviour. Secondly we aimed to explore the barriers and enablers identified by these women that preclude and facilitate making healthy change during pregnancy.

Methods:

The first study surveyed 150 women in early pregnancy, utilising a questionnaire relating to their willingness to make lifestyle changes during pregnancy and knowledge of recommended weight gain and risk of pregnancy complications due to increased BMI. The second study interviewed 26 women who were overweight or obese during pregnancy at 28 weeks gestation. The qualitative data were analysed using thematic analysis.

Results:

All women surveyed in early pregnancy, indicated a willingness to make changes to their lifestyle to improve the health of their baby. Most women had already attempted to make healthy changes prior to pregnancy. Women overestimated their recommended weight gain and underestimated the risk of complications associated with increased BMI, both for themselves and their infants. Overweight and obese women cited the following barriers to making healthy change during pregnancy: physiological, emotional, cognitive, interpersonal, and environmental. Similar enablers were identified by overweight and obese women and more barriers were identified than enablers, indicating that women were more sensitive to barriers than the enablers for making healthy change.

Conclusions:

Education regarding the risks associated with increased BMI in the perinatal period and the extension of pregnancy interventions to the pre-conception period may improve the efficacy of pregnancy interventions. Interventions in pregnancy should adopt an individualised approach and test the effect of the involvement of family and friends.

S5.3. SYMPOSIUM: Opportunities and challenges with dietary patterns in behavioral nutrition

Chair: Jill Reedy, National Cancer Institute, Rockville, MD, USA

S5.3.1

Operationalizing the Mediterranean Dietary Pattern into a Mediterranean Diet Score: A Review of the Achievements and Challenges

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Introduction: Since the realization that a holistic approach should be used in nutritional epidemiology, the Mediterranean dietary pattern (MDP) gained worldwide attention. The Seven Countries study first highlighted the potential benefits of the MDP for cardiovascular health, and since then, other studies have acknowledged beneficial effects of this diet on other health outcomes.

Methods: The MDP was defined as the dietary pattern prevalent in the olive-growing areas of the Mediterranean basin in the 60's, and it is characterized by a high content on plant-based foods, olive oil as the main added fat, moderate consumption of fish and dairy products, and low consumption of meat products, together with moderate intake of alcohol (wine) with meals. In order to translate this dietary pattern into a single variable to be modeled in nutritional epidemiologic studies, *a priori* index score, the Mediterranean diet Score (MDS) was developed. This score summarized the consumption of 9 typical components of the MDP by scoring participants 0/1 points depending on level of consumption (in relation to sex-specific medians) and summing up points, creating a total score with a range of 0-9. The MDS was first designed to be applied in Mediterranean populations for cardiovascular health; however multiple studies have attempted to modify this score in order to make it adaptable to other non-Mediterranean populations or other health outcomes.

Results: Notable examples of these modification include the alternative Mediterranean Diet Score (aMED), created to be applicable in USA population and to better reflect current dietary guidelines; or the relative Mediterranean Diet Score (rMED), that considers the intake of olive oil and includes the energy-adjustment of food components. Still, one of the main limitations of the MDS has not yet been overcome: the use of population-based medians as cut-off to define high or low intakes. Other aspects of the Mediterranean way of eating, such as meal patterns or cooking techniques are not considered as part of the MDS and may limit the usefulness of the score in reflecting the MDP.

Conclusion: Insights into potential methodological improvement for assessing adherence to the MDP will be addressed and discussed.

S5.3.2

Operationalizing World Cancer Research Fund Cancer Prevention Recommendations Using an Index Score

Panagiota Mitrou

World Cancer Research Fund International, London, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Introduction: In 2007, the World Cancer Research Fund (WCRF) and the American Institute of Cancer Research (AICR) issued ten recommendations (8 general and two special-for cancer survivors and about breastfeeding) on food, nutrition and physical activity for cancer prevention based on the most comprehensive collection of available epidemiological evidence. The top three recommendations related to overweight and obesity and were at the top as the Panel felt these were most important. Physical activity was also important independently of its effect on body fatness. For each recommendation there are personal recommendations and public health goals. In the last four years there has been increased interest in investigating whether adherence with the WCRF recommendations for cancer prevention is related to beneficial effects on health outcomes.

Methods: An index score reflecting adherence with the WCRF Recommendations for Cancer Prevention (WCRF score) was developed. The key components of each recommendation were identified and specific cut-offs were selected based on information provided in the recommendations or arbitrary *a priori* cutoffs were defined for intermediate categories. Some recommendations such as foods that promote weight gain and plant foods have subrecommendations: each subrecommendation was scored and the component score was the average of the subrecommendation scores. The scoring system was based on the hypothesis that each major recommendation contributes equally to the total WCRF score. Higher scores indicated greater adherence.

Results: There have been at least eight studies between 2012-2014 from USA, Canada and Europe using variations in the construction of the score depending on data availability and study objectives. Despite these variations, in almost all studies adherence to the recommendations has shown inverse associations with health outcomes including all cancer incidence, cancer specific incidence (breast and prostate cancer), all cause-, cause-specific mortality, quality of life and mortality in female elderly cancer survivors.

Conclusions: This talk will discuss limitations and methodological issues in the operationalization of the WCRF cancer prevention recommendations into an index in epidemiological studies. It will also attempt to provide insight into how best to address these issues in order to better estimate the potential impact of adhering to these recommendations.

S5.3.3

Challenges in the Standardization and Application of Different Diet Quality Index Scores to Different Populations: Examples from the European Prospective Investigation into Nutrition and Cancer

Camille Lassale

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Introduction: Research on dietary patterns and health outcomes has been hampered by a range of limitations. First, there is a lack of consistency in methods used, including heterogeneity in the underlying concepts and constructs selected, metrics used, choice of thresholds and scoring algorithm. Second, there are great differences in population, design and methodology of the different studies, such as diet assessment instruments (e.g. FFQ, 24h recalls). Because of these limitations, no firm conclusions regarding the role of dietary patterns on chronic diseases could be drawn to guide public health recommendations.

Methods: The National Cancer Institute initiated the Dietary Patterns Methods Project (DPMP) to strengthen the scientific evidence relating dietary patterns to mortality in 3 U.S. cohorts, using identical methods and models. A similar initiative has been started in the European Prospective Investigation into Nutrition and Cancer (EPIC) cohort study of 500 000 men and women from 10 European countries to assess and compare the predictive value of a diet quality scores in relation to mortality. Criteria for selection: most widely and commonly used in nutritional epidemiology (Mediterranean Diet Score, DASH), most recent (Healthy Eating Index, WHO Healthy Diet Index), adaptable to an international context (Diet Quality Index International), public health relevance, and data availability.

Results: The following main challenges will be discussed:

- - Data availability: some data missing for specific component calculations
- o Construction of modified scores if data on one component is missing (e.g. sodium)
- o Score ineligible if data for 2 components unavailable (e.g. the Alternate Healthy Eating Index includes trans fat and sodium, unavailable in EPIC)
- - Dietary data collection instruments different from country to country
- o Stratification of the models by study centre
- o Calibration of the FFQ by a 24h recall on a subsample
- - No or very low consumption of specific items in some countries: e.g. olive oil, legumes, dark bread → country specific thresholds?
- - Portion sizes: from MyPyramid Equivalents to g/day → necessity of standardized and published data

Conclusion: There is a need for standardization and transparency to attain consensus in the role of dietary patterns on health.

S5.3.4

Operationalizing US Dietary Guidelines with the Healthy Eating Index and Applications to the Dietary Patterns Methods Project

Susan Krebs-Smith

National Cancer Institute, Rockville, MD, USA

SIG: No, this communication does not fit in any of the SIGs

Awards:

Introduction: The Dietary Guidelines for Americans (DGA) are a collection of recommendations covering multiple aspects of a healthful dietary pattern, including balancing calories to manage weight, reducing certain foods and food components, increasing other foods and nutrients, and accounting for all foods and beverages consumed. Designing an index to assess these disparate constructs was a challenge, requiring certain concessions and assumptions.

Methods: The Healthy Eating Index-2010 (HEI-2010) is the latest iteration of the HEI, updated to reflect the 2010 DGA. Like its predecessor, the HEI-2005, it was deliberately designed to capture the quality of the diet, rather than the total quantity. It uses a density approach to set standards (e.g., per 1,000 calories or as a percentage of calories), and it employs least restrictive standards (i.e., those that are easiest to achieve among recommendations that vary by energy level, sex, and/or age). The index was originally tested for construct validity and reliability, and more recently for predictive validity in several large cohorts, along with three other indices, as part of the Dietary Patterns Methods Project.

Results: By focusing on quality, rather than quantity (that is, appropriateness of total energy intake, which can be assessed more accurately with weight status), developers avoided a key methodological impediment—resulting in an index with wider applicability. The density approach allows the index to assess any set of foods, from the food supply to individual consumption. Although recommendations vary by energy level, sex and/or age, the use of a single set of standards succeeds because the variance is not wide. The HEI-2010 detects meaningful differences in diet quality among individuals, distinguishes between groups with known differences and performs similarly to other indices in predicting mortality. Its usefulness extends beyond the total score. Because each of the components reflects a key aspect of dietary guidance and is graded using intervally-scaled scores, these component scores can be examined separately but collectively to examine multi-dimensional patterns.

Conclusions: The HEI-2010 and other indices have most often been examined as indicators of overall diet quality; additional studies would benefit from examining the multiple components simultaneously using patterns techniques.

S6.3. SYMPOSIUM:

Physical activity to promote positive mental health – what health promotion opportunities do we miss when we are preoccupied with disease prevention and treatment?

Chair: Stuart J Biddle, Victoria University, Melbourne, Australia

S6.3.1

Happiness in motion: School travel and well-being

Guy Faulkner¹, Subha Ramanathan¹, Michelle Stone², Catherine O'Brien³

¹University of Toronto, Toronto, ON, Canada, ²Dalhousie University, Halifax, NS, Canada, ³Cape Breton University, Sydney, NS, Canada

SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Active school travel (AST) can provide a significant source of physical activity for children and youth. Yet, rates of AST are declining in many countries. Barriers to AST include parental safety concerns and the convenience of driving. A pan-Canadian School Travel Planning intervention was recently conducted. A novel component was exploring emotion, well-being, and travel mode framed by the concept of “sustainable happiness.” The purpose of this study was to examine relationships between travel mode and emotions and parent perceptions of their child’s travel mode on well-being.

Methods: Questionnaires were administered to families (N = 5423) from 76 elementary schools across Canada. Explanatory variables were demographics (age and sex), school travel measures (mode, distance, accompaniment by an adult, safety, and barriers), and emotions (parent and child). Outcomes examined parent perceived benefits of travel mode on dimensions of well-being (physical, emotional, community, and environmental). Descriptive statistics, chi-square tests and hierarchical regression were used.

Results: Parents and children who used AST reported more positive emotions compared to those who travelled by car. Parents of active travelers reported stronger connections to dimensions of well-being. AST had the strongest association with parents’ perceptions of their child’s well-being, and positive emotions (parent and child) were also significantly related to well-being on the trip to school.

Conclusions: As an additional potential benefit of AST, interventions should raise awareness of the positive emotional experiences for children and their parents. Future research is required to experimentally examine if AST causes these emotional benefits. Whether such benefits are linked to educational outcomes of particular interest to schools also should be considered.

S6.3.2

Reducing Screen-time Improves Well-being in Adolescent Boys: Findings from the ATLAS Cluster RCT

David Lubans, Jordan Smith, Andrew Miller, Kerry Dally, Philip Morgan

University of Newcastle, New South Wales, Australia

SIG: Yes, Motivational Dynamics

Awards:

Objective: The primary objective of this study was to explore the impact of the ‘Active Teen Leaders Avoiding Screen-time’ (ATLAS) program for adolescent boys on subjective well-being. The secondary objective was to determine if changes in physical activity, screen-time, body fat and muscular fitness mediated the effect of the intervention on well-being.

Methods: The ATLAS intervention was conducted in low-income communities and evaluated using a cluster randomized controlled trial in 14 secondary schools in New South Wales (NSW), Australia. The multi-component, school-based intervention was informed by Self-Determination Theory and Social Cognitive Theory. Assessments were conducted at baseline and immediately post-intervention (8-months). Outcomes included subjective well-being, body fat (bioelectrical impedance analysis), physical activity (accelerometers), muscular fitness (push-ups), and recreational screen-time.

Results: A total of 289 adolescent boys (mean age = 12.7 ± 0.5 years) completed baseline and posttest assessments. There were significant intervention effects for well-being [1.40 units, standard error (SE) = 0.63, $p = 0.027$], screen-time (-41.0 min/day, SE = 8.5, $p < 0.001$) and muscular fitness (1.6 repetitions, SE = 0.7, $p = 0.024$). However, only screen-time satisfied the criteria for mediation (AB = 0.53, SE = 0.27, 95% CI = 0.05 to 1.12).

Conclusions: This study has provided causal evidence for the beneficial effects of reducing screen-time and improving muscular fitness on well-being in adolescent boys. Targeted physical activity programs for adolescent boys may have utility as a strategy for mental health promotion in this cohort.

S6.3.3

Physical activity and happiness: positive associations in Australian low-socioeconomic settings

Justin Richards¹, Shane Hearn², Anne Grunseit¹, Rona Macniven¹, Don Nutbeam³, Adrian Bauman¹
¹University of Sydney, Sydney, NSW, Australia, ²Macquarie University, Sydney, NSW, Australia, ³University of Southampton, Southampton, Hampshire, UK

SIG: Yes, Motivational Dynamics

Awards:**Purpose:**

The paucity of evidence for the association between adolescent physical activity (PA) and positive constructs of mental health is pertinent in low socio-economic settings where cost-effective and innovative health promotion is required. Indigenous Australians are over-represented in these settings and may respond differently to approaches that focus on promoting well-being rather than preventing disorders. This study examines the association between adolescent leisure-time PA and happiness in low socio-economic settings with high proportions of Indigenous Australians.

Methods:

Cross-sectional survey of 996 students aged 13-17 years from Australian low socio-economic settings was completed. We categorised leisure-time PA according to duration (short: ≤ 0.5 hour/week; moderate: 1-3 hours/week; long: ≥ 4 hours/week) and frequency (low: ≤ 1 x/week; moderate: 2-3 x/week; high: ≥ 4 x/week). Participants also indicated organised sports team membership (yes/no). We dichotomised responses to how participants felt about life (1: very happy; 2: OK/not very happy/not happy at all). Generalised linear models were used to calculate prevalence ratios (PR) for the association of happiness with PA (duration/frequency) adjusted for team membership, age and gender. The model for team membership was adjusted for PA, age and gender. Differences between Indigenous ($n=359$) vs. non-Indigenous participants ($n=637$) were also explored.

Results:

There appeared to be a positive dose-response association between PA and happiness. When compared to ≥ 4 hours/week of PA, participants reporting ≤ 0.5 hours/week were 25% less likely to be very happy (PR=0.75; 95%CI: 0.61-0.92) and those reporting 1-3 hours/week were 23% less likely to be very happy (PR=0.77; 95%CI: 0.65-0.91). Similar results were observed for low PA frequency (PR=0.75; 95%CI: 0.61-0.92) and moderate PA frequency (PR=0.81; 95%CI: 0.68-0.96) when compared with high PA frequency. Sports team members were 32% more likely to be very happy (PR=1.32; 95%CI: 1.12-1.54). There were no significant differences in prevalence of reported happiness or physical activity for Indigenous vs. non-Indigenous participants.

Conclusions:

Sports team membership and increasing PA duration and frequency were all strongly associated with a higher likelihood of feeling very happy. In low socio-economic settings there appears to be no difference in reported happiness or physical activity between Indigenous vs. non-Indigenous adolescents. Future research is indicated to establish causation and assess the implications on resilience to mental health disorders in disadvantaged populations where negative health outcomes are normalised.

S6.3.4

Within-person change and associations of change in self-esteem, physical self-concept and physical activity in adolescent girls

Magnus Lindwall¹, Hülya Aşçı², Peter Crocker³
¹University of Gothenburg, Gothenburg, Sweden, ²Baskent University, Ankara, Turkey, ³University of British Columbia, Vancouver, Canada

SIG: Yes, Motivational Dynamics

Awards:**Purpose:**

Physical self-esteem and self-perception are important psychological constructs in overall self-concept during adolescence that have been associated with participation in physical activity. The purpose of this study was to examine the patterns and associations of change over time in global self-esteem (GSE), physical self-perceptions (PSP) and physical activity in adolescent females.

Methods:

A sample of 705 Canadian adolescent females was assessed at three time points during a period of 24 months. The Physical Self-Perceptions Profile was used to measure GSE and the five PSP subdomains: physical self-worth (PSW); sport competence (Sport); body attractiveness (Body); physical conditioning and exercise (Cond); physical strength and muscular development (Strength). The Physical Activity Questionnaire for Adolescents (PAQ-A) was used to assess physical activity. Univariate and multivariate/parallel latent growth curve models (LGCM) were used to analyze the data in Mplus (version 7.1).

Results:

The data for all variables fitted the univariate models and parallel LGCM. The average within-person change in GSE was not statistically significant. However, there was a significant deterioration in all PSP variables ($p<0.01$) with the exception of a significant improvement in Body ($p<0.01$). There was also a significant decrease in physical activity participation ($p<0.01$). Significant between-person heterogeneity was found for change in all variables. Change in physical activity was significantly associated with change in Sport, Cond and Strength ($r_s=0.62-1.00$; $p<0.01$), but not with change in GSE, PSW or Body at a between-person level. Occasions-specific fluctuations within-persons in physical activity were associated with similar within-person fluctuations in the same direction in GSE, PSW, Sport, Cond and Strength.

Conclusions:

There appeared to be a general decrease in physical activity levels over time that was most strongly associated with concurrent deterioration in perceptions of physical fitness and sport competence. However, higher levels of self-esteem and perceptions of self-worth may attenuate the declines in physical activity participation and vice versa. Future research is indicated to assess whether interventions that promote physical activity also maintain self-concept in adolescent females and the potential long-term implications on physical and mental health.

S7.3. SYMPOSIUM:

School environments, physical activity and sedentary behaviour in youth: lessons learned and what's next on the agenda?

Chair: Katie L Morton, University of Cambridge, Cambridge, Cambridgeshire, UK

S7.3.1

School-based environmental influences of physical activity in adolescent populations: A mixed methods systematic review

Katie Morton¹, Andrew Atkin¹, Kirsten Corder¹, David Turner², Marc Suhrcke³, Esther van Sluijs¹

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SIG: Yes, Policies and environments

Awards:

Purpose: Given the increasing academic and policy interest in interventions aiming to promote young people's health by ensuring that the wider school environment supports healthy behaviours, the purpose of our mixed methods review was to (a) summarise what is currently known about school-based environmental influences on adolescent physical activity (PA), and (b) to identify gaps in the literature and future directions regarding potentially effective approaches.

Methods: We conducted a literature search of several electronic databases (MEDLINE, Web of Science, PsycINFO, and ProQuest). To be eligible for inclusion, studies must involve healthy secondary school-aged children. We defined the school environment as the "physical and aesthetic surroundings of the school and/or the psychosocial climate and culture of the school". In this sense, environment refers to the wider 'ethos' of the school relating to PA, including PA-specific policies, school organisation and teaching as well as the physical environment (e.g., features of the classroom or outside space). We excluded multicomponent studies (e.g., environmental intervention plus family component) and studies that focussed on individual-level interventions targeting motivational and reflective processes (e.g., health education). Quantitative findings were synthesised using harvest plots and qualitative data were analysed using thematic analysis.

Results: We identified 10174 unique articles. 309 quantitative and 187 qualitative studies were retained for full text screening. Upon inclusion, data extraction includes details of the study design, intervention components (or exposure measures for observational studies), theoretical framework, primary outcomes (e.g., moderate-vigorous PA, sedentary time) or themes (from qualitative studies), secondary outcomes (e.g., psychosocial variables), any cost/cost-effectiveness data and risk of bias. Promising approaches for shifting the distribution of activity within the school environment will be discussed.

Conclusions: By including multiple forms of evidence from different types of research (e.g., experimental, observational and qualitative data) mixed-methods reviews can maximize learning and the ability of the findings to inform policy and practice. This review will inform the selection of several environmental interventions to take forwards to a feasibility trial to examine the impact of modifying the schools' physical and/or social environment on adolescent PA and sedentary behaviours.

S7.3.2

Adolescence-In-Motion: Process Evaluation of a Transformational Teaching Intervention for Physical Education Teachers

Desmond McEwan¹, Julian Barling², Luc Martin³, Mark Bruner⁴, Chris Shields⁵, Louise Masse¹, Justine Dowd¹, Mark Beauchamp¹
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: The overall purpose of this study was to conduct a qualitative process evaluation of the *Adolescence-In-Motion* (AIM) intervention. Underpinned by principles of transformational leadership theory (Bass & Riggio, 2006), the overall objective of the AIM intervention was to support physical education teachers in their daily interactions with students and thereafter student physical activity behaviour. In this process evaluation, we sought to conduct in-depth interviews with teachers in the intervention condition, and examine strengths and limitations of the program, with specific reference to the one-day workshop that provided the basis for the intervention, as well as the accompanying print and on-line materials, and follow-up support that was provided for teachers.

Methods: Following the conclusion of the program, semi-structured interviews (n = 30) were conducted with teachers who took part in the intervention. Participants were queried with regard to the utility, relevance, and their satisfaction with the intervention as well as issues related to implementation fidelity and application within teachers' continuing professional development activities. Interview data were analyzed using a directed content analytic approach (Hsieh & Shannon, 2005).

Results: All teachers spoke very positively of the intervention in terms of overall enjoyment, relevance, and satisfaction. Although some participants described making small changes in terms of their own behaviors as a teacher, many spoke about finding it difficult to overcome certain barriers that precluded them from implementing what they learned from the workshop into their everyday teaching lives on a consistent basis. In particular, these included time constraints (e.g., being able to connect with each student within their limited classroom time) and being mindful of their transformational leadership goals (i.e., breaking old teaching habits). Participants also provided a variety of suggestions about how the intervention could be improved, such as conducting the intervention prior to the start of the school year (rather than during the middle of a semester) and providing follow-up booster session workshops as "refreshers".

Conclusions: The results of this study will help inform future researchers conducting school-based physical activity interventions, especially those directed towards teachers as focal participants.

S7.3.3

Effects of a pilot school-based physical activity intervention on recess play behaviours and teachers' perceptions of school-based play behaviours in children with intellectual disabilities

Lyne Boddy¹, Samantha Downs¹, Zoe Knowles¹, Stuart Fairclough²

¹Liverpool John Moores University, Liverpool, UK, ²Edge Hill University, Ormskirk, Lancashire, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To investigate the effects of a pilot school-based physical activity intervention on recess play behaviours and teachers' perceptions of school-based play behaviours in children with intellectual disabilities.

Methods: After gaining ethical approvals, informed parental consent and participant assent 37 children aged 5 – 11 years (n = 30 boys) from two UK based Special Educational Needs schools were recruited into this study. The intervention consisted of: 1) additional opportunities for physical activity built into the school day, 2) a series of learning objectives to be delivered to children during class time and 3) encouragement for teachers to facilitate active play during school recess periods. Recess play behaviours (SOCARP) and anthropometric variables were assessed at baseline, post intervention (10 weeks) and at 11 weeks follow up. In addition, retrospective teacher interviews were conducted to assess the implementation and effect of the intervention on children's school-based play behaviours and any other teacher observations related to the intervention. Repeated measures ANCOVAs were conducted to assess the intervention effects on SOCARP variables after controlling for covariates (sex, somatic maturation, body mass index, weather). Qualitative data were analysed both deductively and inductively and outcomes represented using pen-profiling.

Results: Results suggest that the intervention did not significantly influence recess activity levels or other SOCARP variables. Teachers reported that children's classroom behavior and attention to task improved as a result of the physical activity intervention. Teachers also recognised that at post intervention they themselves played a more facilitative role in active play during recess and had a greater awareness of the benefits of physical activity.

Conclusions: The intervention did not influence systematically observed recess play behaviours, but positively influenced class behaviour, teacher PA knowledge, and teacher interactions with children during recess. Further investigation is required to fully elucidate the potential benefits of school-based physical activity interventions as a tool to improve classroom behaviour in children with intellectual disabilities.

S7.3.4

From efficacy to maintenance to implementation: translating the Transform-Us! study to reduce children's sitting time in school and home

Jo Salmon¹, Lauren Arundall¹, Nicky Ridgers¹, Ester Cerin¹, Helen Brown¹, David Dunstan², Anna Timperio¹

¹Deakin University, Melbourne, Australia, ²Baker IDI Heart and Diabetes Institute, Melbourne, Australia

SIG: Yes, Policies and environments

Awards:

Purpose: Physical activity confers important benefits to child health, and recent evidence suggests that sedentary behaviours may be adversely associated with children's weight status, independent of participation in physical activity. With children accumulating over 70% of their waking sedentary time during school hours, the classroom environment is an important setting for reducing sitting time in children. However, the translation of a large efficacy trial from research to practice has not been systematically assessed. The purpose of this presentation is to explore some of the key learnings from the longer-term maintenance effects and translating the findings of a large efficacy trial (the Transform-Us! study) to practice using pedagogical and environmental approaches for reducing children's sitting time.

Methods: The program involved both pedagogical (e. g., training teachers to deliver 30 min standing lessons and provide 2-min standing breaks every 30 mins) and environmental approaches (e.g., access to novel play equipment, playground line markings) over a 2.5 year period among 8-10 year old children living in mid and low socioeconomic position (SEP) areas of Melbourne. All 20 schools participated in the follow-up of the Transform-Us! study, with teachers completing an on-line survey (data currently being collected). Two local government areas in low SEP areas are working with the researchers to disseminate the program to primary schools in their area. Outcome variables will include the number of children and teachers engaged in the program, satisfaction with the program, perceived changes to sitting time, and effectiveness of strategies on learning and other cognitive outcomes.

Results: Preliminary results suggest that the Transform-Us! program appears sustainable; however, there are challenges in translating the full program in terms of teacher training, equipment costs and so on. The program was distilled into 3 key areas: classroom approaches, teacher pedagogical approaches, and playground environmental approaches.

Conclusions: This study will enhance understanding of how best to translate research into practice. Particular challenges include trying to maintain the integrity of the program once it is disseminated, and in particular the retention of key features considered essential for reducing children's sitting time.

S8.3. SYMPOSIUM:

Target 2025: Innovation and advocacy on salt reduction

Chair: Jacqui Webster, The George Institute for Global Health, Sydney, Australia

S8.3.1

SUPPORTING LOWER SALT FOOD CHOICES FOR PEOPLE WITH CVD: RANDOMISED CONTROLLED TRIAL OF THE SALTSWITCH SMARTPHONE APP

Helen Eyles¹, Bruce Neal², Robert Doughty¹, Yannan Jiang¹, Rebecca McLean¹, Cliona Ni Mhurchu¹
¹University of Auckland, Auckland, New Zealand, ²University of Sydney, Sydney, Australia

SIG: Yes, Policies and environments

Awards:

Objective: To determine the effectiveness of the SaltSwitch smartphone application (app) in lowering the salt content of food purchases made by households where at least one member has diagnosed cardiovascular disease (CVD).

Methods: SaltSwitch is a novel smartphone app to help people with CVD make lower salt food choices. The app enables shoppers to scan the barcode of a packaged food and receive an immediate, interpretive, traffic light nutrition label on the screen along with suggestions for healthier lower-salt alternatives. A 6-week two-arm parallel RCT to determine the effectiveness of SaltSwitch was undertaken between June 2014 and March 2015. Three-hundred adults with CVD and their corresponding main household shoppers were recruited from research lists, cardiac rehabilitation clinics, GP clinics, and communities in Auckland. Participants were randomised to either: (1) the SaltSwitch smartphone app; or (2) no intervention. The primary outcome was the salt content of household food purchases assessed. Secondary outcomes included: household purchases of saturated fat and energy, food expenditure, ambulatory blood pressure, and self-reported use and acceptability of the SaltSwitch app. Household nutrient purchases will be assessed using objective till receipt data; receipts will be scanned and electronically linked with branded food composition data.

Results: Details of app development, study design, recruitment, and trial findings will be presented.

Conclusions: The SaltSwitch smartphone app has potential to improve lower salt intakes for people with CVD.

S8.3.2

Effectiveness and equity of national interventions to reduce salt

Lindsay McLaren¹, Nureen Sumar¹, Amanda Barberio¹, Norm Campbell¹, Diane Lorenzetti¹, Val Tarasuk², Kathy Trieu³, Jacqui Webster³

¹University of Calgary, Alberta, Canada, ²University of Toronto, Ontario, Canada, ³The George Institute for Global Health, Camperdown, Australia

SIG: Yes, Policies and environments

Awards: No

Purpose: To assess the impact of population-level interventions for dietary sodium reduction in government jurisdictions worldwide, as well as the differential impact by social and economic indicators.

Methods: The review protocol is registered with the Cochrane Public Health Review Group. Searches were run using MEDLINE, Cochrane CENTRAL Register, Cochrane Public Health Register, EMBASE, Web of Science, LILACS, Effective Public Health Practice Project Database, TRoPHI, OpenGrey, WHO, and World Action on Salt and Health. Reference lists of included studies were examined; experts were contacted; and country program leaders were contacted. Evaluations of dietary sodium reduction initiatives in government jurisdictions were included. Two authors independently extracted data and assessed the risk of bias of included initiatives. Intervention types identified a priori, to represent a continuum ranging from more agentic to more structural, were: public information campaigns, on-package nutrition information; restrictions on marketing to children; food procurement policy; large-scale pricing interventions; and large-scale food product reformulation.

Results: Over 12,500 citations were considered from the peer-reviewed and grey literatures. Evaluations from both the peer-reviewed and grey literatures were included in the final sample. All of the sodium reduction initiatives were national in scope and most included more than one intervention type. The majority were salt-specific initiatives, while others were salt reduction initiatives embedded within a broader program. Most initiatives occurred in high-income countries. Initiatives were evaluated using an uncontrolled pre-post design, an interrupted time series design, or a controlled cross-sectional design where intervention impact was modeled via econometric analysis. Overall, preliminary findings indicate a reduction in sodium intake in many countries; however, the quality of the evidence for the impact of initiatives was modest. Differential impact by social and economic indicators was infrequently evaluated.

Conclusions: This is the first systematic review to evaluate the impact of national sodium reduction initiatives, including an assessment of methodological quality. Though findings are promising, emphasis needs to be placed on rigorous evaluation of national sodium reduction initiatives, including equity of impact.

S8.3.3

To legislate or not to legislate? A comprehensive review of national programs to reduce salt

Kathy Trieu¹, Bruce Neal¹, Corinna Hawkes², Elizabeth Dunford¹, Norm Campbell³, Lindsay McLaren⁴, Amanda Barberio⁴, [Jacqui Webster](#)¹

¹The George Institute for Global Health, University of Sydney, NSW, Australia, ²World Cancer Research Fund, London, UK, ³Libin Cardiovascular Institute, University of Calgary, Calgary, Canada, ⁴University of Calgary, Calgary, Canada

SIG: Yes, Policies and environments

Awards:

Purpose: To review progress of salt reduction strategies around the world in relation to the global target to reduce population salt intake by 30% by 2025.

Methods: A systematic review of the published and grey literature was supplemented by questionnaires sent to country program leaders. Core characteristics of strategies were extracted and categorised according to a pre-defined framework.

Results: 75 countries now have a national salt reduction strategy, more than double the number reported in a similar review in 2010. The majority of programs are multifaceted and include industry engagement to reformulate products (n=60), establishment of voluntary (36) and mandatory (9) sodium content targets for foods, consumer education (71), front-of-pack labelling schemes (31), taxation on high-salt foods (3) and work in public institution settings (54). Some form of legislation related to salt reduction has been implemented in 33 countries. 12 countries have reported a reduction in population salt intake, 19 have reported reduced salt content in foods and six have reported improvements in knowledge, attitude or behaviours relating to salt.

Conclusion: A significant number of countries now have salt reduction strategies, and an increasing number of programs have reported an impact in terms of reducing population salt intake, lowering salt levels in food and improving consumer knowledge, attitude and behaviour in relation to salt. Whilst this positive, the quality of the evidence varies and further work is required to understand what makes interventions effective and in which countries. This review shows that implementing a salt reduction program is feasible in all regions and income levels. However more countries, particularly low and middle income countries need to adopt and monitor salt reduction strategies to ensure the global target is achieved.

S8.3.4

Title: Salt reduction in the UK, a very successful public health policy and it's applicability to the rest of the world

[Graham MacGregor](#), Feng He, Farrand Clare
Queen Mary University of London, London, UK

SIG: Yes, Cancer Prevention and Management

Awards:

Objective: To provide a comprehensive analysis of the UK's salt reduction programme with the aim of providing a step by step guide of developing and implementing a national salt reduction strategy, which other countries could follow.

Methods: We identified a number of key components of the UK salt reduction programme by reviewing (1) the UK salt reduction policy, (2) Journal and press articles, and (3) relevant internet website. These included (1) setting up an action group;(2) determining salt intake, and major sources of salt in the diet;(3) setting a population level salt intake target;(4) setting salt targets for processed food;(5) reformulation by food industry;(6) clear labelling of salt;(7) consumer awareness campaigns;(8) monitoring progress;(9) applying pressure via media and threat of regulation by Department of Health.

Results: The UK salt reduction programme has led to a 15% reduction in the average salt intake of the population during the past seven years at a small cost with potentially major healthcare savings and potential large reductions in the number of people suffering or dying from strokes, heart attacks and heart failure. The UK now has the lowest known salt intake of any developed country as measured by 24-hour urinary sodium. A key to success is the rigorous setting of progressively lower salt targets with a clear timeframe and independent monitoring programme. Many countries including the US, Canada and Australia are following the UK's lead and setting their own targets.

Conclusions: The UK salt reduction programme reduced the salt intake of the whole population by gradual reformulation on a voluntary basis, reinforced by strong media pressure. Several countries are already following the UK's lead. The challenge now is to spread this out to all other countries around the world with appropriate local modifications. A reduction in salt intake worldwide will result in major public health improvements and cost-savings. WASH, a similar group to CASH, with over 500 members in 100 countries is encouraging and supporting this action worldwide.

S9.3. SYMPOSIUM:

Diet and Physical Activity Interventions for Cancer Survivors: Advancing the Field via Pragmatic Intervention Delivery and Exploring Strategies to allow Personalised Lifestyle Prescription

Chair: Erica I James, University of Newcastle, Newcastle, NSW, Australia

S9.3.1

Promoting physical activity among breast cancer survivors using computer-tailored online interventions: IMove More for Life RCT

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: This study investigates the effects of three online computer-tailored interventions (differing in delivery schedule) designed to promote physical activity among breast cancer survivors. The interventions were adapted from a previously evaluated print-based intervention (consisting of 3 tailored newsletters delivered monthly) to allow for delivery online, and/or different delivery schedules.

Methods: Study invitations were sent to breast cancer-related review and survey groups ($n = >10,000$) in Australia. Of those invited, 725 logged on to the website and completed the screening survey; 549 were eligible and randomised to receive either a single module intervention, a three-module intervention delivered weekly, or a three-module intervention delivered monthly. Physical activity participation (aerobic and resistance-based) is assessed using a previously validated self-report tool. Usability and acceptability is assessed using purpose-built items based on theory related to engagement in online interventions. Assessments occur via the study website at baseline, 3 and 6 months post-baseline. Linear mixed models assessing main effects of time and group and a group*time interaction were used to assess treatment effects. Sensitivity analyses (BOCF) were conducted to explore the impact of missing data.

Results: Of those randomised, 503 (91%) completed baseline. Participants were generally middle-aged (mean age = 55, SD = 9.72) and married (74%), but heterogeneous in terms of income, education and location type. The 3-month follow-up data are currently being collected (complete in November 2014). Preliminary analyses using available data ($n = 131$, response rate = 35%) show a significant main effect of time ($p < 0.01$) but no group or group*time effect ($p < 0.05$). Likewise, process evaluation data show all participants rated the website highly, with no between group differences. The BOCF analyses yielded similar results.

Conclusion: The development and implementation of low-cost and sustainable approaches to physical activity promotion has the potential to significantly improve quality of life and survival outcomes of breast cancer survivors. Online interventions are a promising approach, but few have been tested in this population and little is known about optimum delivery schedules. This study will be useful for informing future breast cancer recovery initiatives delivered online.

S9.3.2

Randomized controlled trial of the effects of high intensity and low-to-moderate intensity exercise on physical fitness and fatigue in cancer survivors: Results of the Resistance and Endurance exercise After ChemoTherapy (REACT) study.

Caroline Kampshoff¹, Mai Chin A Paw¹, Johannes Brug¹, Jos Twisk¹, Goof Schep², Marten Nijziel², Willem van Mechelen¹, Laurien Buffart¹

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Exercise after cancer treatment is safe and improves physical fitness and reduces fatigue. However, the effects of different exercise intensities are unknown. The Resistance and Endurance exercise After ChemoTherapy (REACT) study aimed to evaluate the effectiveness of a high intensity (HI) compared to a low-to-moderate intensity (LMI) resistance and endurance exercise program and a wait list control (WLC) group in a large group of cancer survivors who completed primary cancer treatment on physical fitness and fatigue as primary outcomes.

Methods: The REACT study is a multicenter trial in the Netherlands. A total of 278 cancer survivors were randomly allocated to a 12-week HI ($n=91$) exercise program, a LMI ($n=96$) exercise program or WLC group ($n=91$). Both interventions consisted of equal bouts of resistance and endurance interval exercises with the same frequency and duration, and only the intensity differed. Measurements were performed at baseline ($t=0$), and post-intervention ($t=1$; 12 weeks after randomization). The primary outcome measures were cardiorespiratory fitness and muscle strength assessed with objective measures and self-reported fatigue. Secondary outcome measures included health-related quality of life, body composition, sleep disturbances, anxiety, depression, and daily functioning. Multilevel linear regression analyses were performed to evaluate intervention effects using an intention-to-treat principle.

Results: At the 12 weeks follow-up assessment, there was a dropout rate of 9%. Overall adherence to the exercise programs was 86%. HI exercise significantly improved cardiorespiratory fitness compared to WLC group ($\beta=1.6$, 95% CI=0.6; 2.5), with no significant differences between LMI exercise ($\beta= 0.9$, 95% CI=-0.09; 1.8) and WLC. At 12 weeks follow-up HI and LMI exercise showed significantly larger reductions on general fatigue, physical fatigue and reduced activity compared to the WLC, with no significant differences between both intervention groups. Furthermore, HI exercise showed significant larger improvements on global QOL ($\beta=5.8$, 95% CI=1.9; 9.8) compared to WLC. Finally, we found no significant differences between groups in upper and lower body muscle strength.

Conclusions: Exercise showed significant beneficial effects on cardiovascular fitness, fatigue and QOL in cancer survivors after completion of their primary cancer treatment. HI exercise was superior to LMI exercise for cardiorespiratory fitness and global QOL.

S9.3.3

Pragmatic lifestyle intervention for men receiving long-term androgen-deprivation therapy for advanced prostate cancer: results of a randomised controlled trial with internal pilot.

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Anglia, Norwich, England, UK

SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Lifestyle interventions could play an important role in ameliorating the side effects of androgen deprivation therapy (ADT) in men with advanced prostate cancer. Supervised exercise programmes result in short-term improvements in exercise behaviour, quality of life (QoL), fatigue and functional capacity, whereas high total energy and dietary saturated fat intake are linked to disease progression. Given the costs of supervised programmes, there is a need to evaluate more pragmatic lifestyle interventions that can equip men with the necessary skills and confidence for long-term changes in independent health behaviours.

Methods: We randomised 100 hundred sedentary men with locally advanced or metastatic prostate cancer receiving ADT into a lifestyle intervention or usual care control group. The 12-week lifestyle intervention combined supervised and self-directed exercise with dietary advice and integrated behaviour change support, with supervision being tapered off to increase the emphasis on self-directed behaviour. Exercise behaviour, aerobic exercise tolerance, dietary macronutrient intake, disease-specific QoL (FACT-P) and fatigue (FACT-F) were measured post-intervention and at 6 months after withdrawal of support. In a sub-group of patients (N=50; internal pilot phase), biomarkers associated with disease progression and functional fitness measures were also included at baseline and follow-up.

Results: There were improvements in total exercise behaviour in the intervention group vs controls after 12 weeks and 6 months (adjusted p values: < 0.001 & 0.038, respectively). Reductions in total fat, saturated fat and monounsaturated fat intakes were also observed (p < 0.05). Improvements in FACT-P were seen in the intervention group compared with controls after 12 weeks (mean difference: 8.9 points; adjusted p = 0.001), whereas no difference was apparent at 6 months. Improvements in FACT-F were also observed after 12 weeks (mean difference: 5.3 points; adjusted p < 0.001) and maintained at 6 months (mean difference: 3.9 points; adjusted p = 0.007). In the sub-group analysis, functional fitness measures improved in the intervention group but there were no changes in biomarkers associated with disease progression.

Conclusion: This study shows that pragmatic lifestyle interventions could have a positive impact on health behaviours and other key health outcomes in men with advanced prostate cancer receiving ADT.

S9.3.4

Predicting Optimal cAncer Rehabilitation and Supportive care (POLARIS); meta-analyses of individual patient data of randomized controlled trials evaluating the effect of physical activity and psychosocial interventions on health-related quality of life in cancer survivors.

Laurien Buffart¹, Joeri Kalter¹, Irma Verdonck-de Leeuw², Johannes Brug¹

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Care Research, Amsterdam, The Netherlands, ²VU University

Medical Center, Amsterdam, The Netherlands

SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Numerous randomized controlled trials (RCT) have evaluated the effects of physical activity (PA) or psychosocial interventions (PSI) on health-related quality of life (HRQoL) of cancer survivors, with generally small sample sizes and modest effects. Better targeted interventions may result in larger effects. To realize such targeted interventions, an important first step is to identify which existing intervention works best for which patients and under what circumstances (intervention moderators), and via which mechanisms (intervention mediators). The first aims of the POLARIS study were to (1) conduct meta-analyses on individual patient data (IPD) to evaluate the effects of PA and PSI on HRQoL of cancer survivors, and to (2) identify important demographic, clinical, personal, or intervention-related moderators of the effect.

Methods: RCTs evaluating the effects of PA or PSI on adult cancer survivors' HRQoL compared with a usual care, wait list or attention control group were identified via literature searches in four electronic databases (PubMed, EMBASE, PsychINFO, and CINAHL) or personal communication. All principal investigators of eligible RCTs were invited to join the POLARIS consortium and share their data for pooled analyses to address the proposed aims. After signing data sharing agreements, the raw anonymized data is harmonized and transferred into the POLARIS data warehouse.

Results: We have identified 137 eligible and unique RCTs. To date (2014-10-14), principle investigators of 60 RCTs (n= 9492) are able and willing to share their data, and data of 29 studies (n= 4668) have been transferred into the data warehouse. On December 1st 2014, we will end the first wave of data collection and start conducting the IPD meta-analyses. At the ISBNPA meeting, we will present the effects and moderators of PA and PSI on HRQoL.

Conclusion: The POLARIS study is an important first step towards evidence-based personalized PA and supportive care interventions for cancer survivors. The ultimate aim of POLARIS is to build a prediction model that supports evidence-based clinical decision making about which intervention would be most effective in improving HRQoL for an individual patient. POLARIS consortium: www.polaris-study.org/organization/consortium-members

S1.4 SYMPOSIUM: Children's Active Transport And Independent Mobility – An International Perspective

Chair: Benedicte Deforche, Ghent University, Gent, Belgium

S1.4.1

A longitudinal study of individual, social and physical environmental predictors of active transport among children living in disadvantaged areas

Alison Carver, Jenny Veitch, Anna Timperio, David Crawford, Kylie Ball, Jo Salmon
Deakin University, Burwood, Victoria, Australia

SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: To identify individual, social and physical environmental predictors of active transport (AT) among school-aged children living in disadvantaged areas, thus addressing a paucity of longitudinal data on this topic.

Methods: Participants were 208 children aged 8–15 years at baseline (T1) and their mothers, followed up at two years (T2). Children survey-reported their AT to school and local destinations. Mothers survey-reported perceptions of their neighbourhood and their child's enjoyment of walking/cycling. Objective built environment measures gathered using a Geographic Information System included: distance to school; numbers of sports facilities, fast food outlets, parks, and total lengths of walking/cycling tracks within 800m and 5000m pedestrian network buffers around children's homes. Walking (33%, T1; 32%, T2) and cycling (12%, T1; 8%, T2) to school were combined in analyses as rates were low. Logistic regressions examined associations between predictors and odds of AT on the school journey at T2 controlling for AT at T1, age, child's sex, distance to school, maternal education and employment. Linear regressions examined their associations with scores for walking and cycling to local destinations, weighted by number of accessible destinations.

Results: Enjoyment of walking to school (OR 4.1, 95%CI 2.0–8.5) and for exercise (OR 1.9, 95%CI 1.0–3.6) were associated with increased odds of AT on the school journey. The following were positively associated with the score for walking to local destinations: enjoyment of walking to school (B=2.2, 95%CI 1.2–3.2); knowing children who use AT (B=1.1, 95%CI 0.1–2.0), ease of walking in neighbourhood (B=1.2, 95%CI 0.1–2.4), mother's confidence in their child walking without adult accompaniment (B=1.8, 95%CI 0.6–3.0); and counter-intuitively associated were the perceived need to cross busy roads to reach play areas (B=1.2, 95%CI=0.2–2.2), and perceived barriers to walking/cycling (B=1.3, 95%CI 0.3–2.2). Perceived stranger danger was inversely associated with the score for cycling to local destinations (B=–1.0, 95%CI=–1.9–0.1), while a swimming pool located within 800m of home was positively associated (B=1.4, 95%CI=0.2–2.6).

Conclusions: Few objective measures were associated with children's AT. There is a need for interventions to increase children's enjoyment of active transport and parents' confidence in their children's ability to engage in this.

S1.4.2

Cycling for transport among children: are micro-environmental factors equally important across different street settings? An experimental study

Ariane Ghekiere^{1,2}, Jelle Van Cauwenberg^{1,2}, Lieze Mertens¹, Peter Clarys², Greet Cardon¹, Jo Salmon³, Ilse De Bourdeaudhuij¹, Benedicte Deforche^{1,2}

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To identify if micro-environmental factors determine preference for cycling routes among children and their parents and to identify if these factors are equally important across different street settings. This study gives more insight in how to design cycling-friendly neighborhoods for children, which has rarely been studied using an experimental approach.

Methods: Children from 5th–6th grade and their parents (n=305) were recruited via 12 randomly selected primary schools in Flanders, Belgium. They completed a web-based questionnaire including 12 choice-based conjoint tasks, in which they had to choose between two possible routes (depicted on manipulated photographs), to (let their child) cycle along. The routes differed in four attributes: general street setting (enclosed, half open, open), evenness of cycle path (very uneven, moderately uneven, even), speed limit (70 km/h, 50 km/h, 30 km/h) and degree of separation between a cycle path and traffic (no separation, curb, hedge). Hierarchical Bayes analyses were conducted to determine the relative importance of each micro-environmental attribute across the three street settings.

Results: The evenness of the cycle path and speed limit were the most important attributes having an effect on children's street preference, while among parents, the degree of separation and speed limit were attributes most strongly associated with choice of street they would prefer their child to cycle along. This pattern was similar across the different street settings. Both children and their parents preferred streets with low traffic speed (vs. 50 or 70 km/h), with a separation of cycle path from traffic with a hedge (vs. a curb or no separation), and with an even cycle path (vs. moderately uneven or very uneven) across all street settings.

Conclusions: The experimental use of panoramic photographs allowed to identify causal associations between micro-scale environmental factors (e.g. evenness of cycle path, speed limitations, ...) and the neighborhood's appeal to cycle for transport among children. The effects of these micro-environmental factors were in the same direction across the different street settings, but differed in strength depending on the street setting. Future on-site research should confirm if changes in these micro-environmental factors actually lead to more transportation cycling among children.

S1.4.3

Association Between Neighborhood Social Environment and Children's Independent Mobility

Noreen McDonald

University of North Carolina, Chapel Hill, USA

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: This cross-sectional study assessed the correlation between demographics, the local environment, and children's independent mobility. Researchers have documented declining levels of independent mobility in recent decades and an associated decline in active travel. Our study seeks to understand variation in independent mobility and the attendant implications for active travel.

Methods: Our study collected data from 403 parents of 10 to 14 year olds living in the San Francisco Bay Area. Respondents were drawn from nine zip codes with walkable built environments, but variation along economic and racial dimensions as well as access to destinations. Respondents were drawn from the Kaiser Permanente Northern California membership database. Survey data was collected in 2006 and 2007. Independent mobility was assessed by parent-report of whether children were allowed to cross major roads, ride transit, and travel to neighborhood destinations without adult accompaniment. The social environment was assessed through standardized scales for social cohesion, child-centered social control and intergenerational closure. Access to neighborhood destinations was measured through GIS analysis of the proximity of parks, schools, stores, and other common destinations. Analyses assessed unadjusted and adjusted correlations using logistic regression.

Results: Independent mobility increased rapidly with age. 27% of 10 year olds were allowed to walk in the neighborhood without adult supervision compared to 68% of 14 year olds. Latinos, girls, and children from lower-income households had lower levels of travel freedom. Children whose parents perceived higher levels of intergenerational closure and social cohesion had more travel freedom. Adjusted models showed younger children, girls, and minorities had lower levels of travel freedom while children of parents who perceived strong levels of neighborhood social cohesion had more freedom.

Conclusions: We found strong variation in independent mobility by child, family, and neighborhood social characteristics. Access to destinations was not significantly related to travel independence. This work provides insights into the opportunities for active travel for children and highlights the importance of parental perceptions of the social environment along with previously-documented variation by demographic characteristics.

S2.4. SYMPOSIUM:

Serious digital games and gamified applications to improve children's healthy diet and physical activity: the importance of involving the social environment

Chair: Ann DeSmet, Ghent University, Ghent, Belgium

S2.4.1

Using Fictional Novellas as Narrative Companion for Vegetable Parenting Game

Tom Baranowski, Janice Baranowski, the Mommio Study Group
Baylor College of Medicine, Houston, Texas, USA

SIG: Yes, e- & mHealth

Awards: No

Objective: Parents of 3-5 year old children often report difficulty getting their children to eat vegetables, which are protective against several chronic illnesses and perhaps obesity. Video games have shown promise for health interventions and may be vehicles for training parenting practices for successful vegetable consumption outcomes. Video games often rely on narratives to provide situational context and modeling of behavior change, but storytelling can interrupt game immersion and alienate players. Delivering game narratives outside of gameplay may provide players with a deep understanding of game situations while maintaining immersion. This study examined young mothers' preference for story genre and whether a narrative, separate from a video game, could generate interest in that video game.

Methods: To assess preference for novella genre among mothers of preschool children, two companion narratives were generated for a vegetable parenting game, Mommio. One narrative was a romance story, and the other a suspenseful fantasy. Mothers of 3-5 year old children (n=18) read both novellas and completed interviews about their experience.

Results: Mothers generally preferred the romance novella, which featured a strong central character, relatable issues and an engaging plot. Most mothers were interested in playing the Mommio video game after reading the novellas.

Conclusions: Prose literature may serve as an immersive narrative companion to (not integrated in) games for health. Most mothers this age tended to prefer the romance genre, but some mothers preferred the suspenseful fantasy. The novella did generate interest in playing the Mommio video game, which offers promise for a new approach to a game for child diet management.

S2.4.2

An exploratory study on parents' barriers to providing appropriate portion sizes for their children and their preferences for healthy eating app features.

Kristina Curtis, Sudakshina Lahiri, Katherine Brown
>> *University of Warwick, Warwick, UK*

SIG: Yes, e- & mHealth

Awards:

Objective: There is currently a lack of mobile health apps that are underpinned with relevant theory and evidence and that directly target parents for childhood weight management. Therefore, this study aimed to develop such an app, and explore the barriers and facilitators to parent's capability, motivation and opportunity (Using the BCW framework and COM-B model) to provide appropriate portion sizes for themselves and their families. It also aims to gather parents' preferences for healthy eating app features.

Methods: A total of 6 focus groups with Change4life advisors (N=5), parents with overweight children (N=14) and parents with healthy weight children (N=8) were conducted before saturation was reached. The capability, motivation, opportunity, behaviour model (COM-B) and Theoretical Domains Framework (TDF) guided semi-structured questions on the barriers that parents face in providing appropriate portion sizes for their children. A User-centred design approach helped to extract user preferences for app features. A thematic analysis was conducted on the data where the COM-B & TDF were used as coding frameworks.

Results: A behavioural analysis revealed barriers in all three COM-B domains and 10 corresponding TDF domains (knowledge, memory, attention and decision making processes, interpersonal skills, behavioural regulation, emotion, social identity, beliefs about capabilities, beliefs about consequences, social influences and environmental context and resources). For example, with regards to 'psychological capability' parents reported a lack of knowledge of appropriate portion sizes and a difficulty in measuring portions. Data on parents' preferences for app features revealed for example, parents preferences for visuals of foods, minimal data input and a tool for the whole family to engage with.

Conclusions: This study represents the first qualitative study using a theoretical model and user-centred approach to explore this area and provides the building blocks for designing a mobile app to support parents with overweight children. The findings can now be linked to relevant behavior change techniques (using the BCW framework) such as supporting parents monitoring of their children's food intake and where elements of gamification can be used to engage the whole family.

S2.4.3

The effectiveness of the Squire's Quest II game intervention to increase home availability of fruit and vegetables

Ann DeSmet¹, Yan Liu², Ilse De Bourdeaudhuij¹, Tom Baranowski²,
Debbe Thompson²
¹*Ghent University, Ghent, Belgium*, ²*Baylor College of Medicine, Houston, Texas, USA*

SIG: Yes, e- & mHealth

Awards:

Objective: Children's dietary behavior is strongly influenced by their family environment, e.g. by home availability of healthy food. Direct parental involvement, via active involvement in activities, or requiring children to engage their parents, in interventions to change children's dietary behavior is therefore advocated. Squire's Quest II is a 10-episode serious game intervention designed to increase fruit and vegetable (FV) intake among children and was effective in changing children's FV intake. The intervention included goal-setting techniques and suggestions for children on to get their parents' support in meeting their goals, and provided supplemental materials for parents via a website and electronic newsletters (e.g. recipes). In this study, we aimed to assess whether children's FV asking behavior influenced home FV availability after the intervention.

Method: Data were collected among 400 children (53% female, age range 9-11) and one of their parents, at three time points (baseline (T0), immediately post intervention (T1), 3 months post intervention (T2)). Children were randomly assigned to 4 conditions (n=100 per group), varying in their use of implementation intentions and coping/action planning. Children's asking behavior for FV (e.g. asking parents to put FV on the shopping list, asking for FV when dining out) and FV home availability were assessed in self-report surveys, using 9-item and 40-item scales respectively. Linear mixed models were used in SAS software.

Results: Home FV availability at T0 significantly affected availability at T1 and T2 ($p<.001$). Children's asking behavior at T0 had a borderline significant influence on FV home availability at T1 ($p=.06$). Children's asking behavior at T1 and T2 significantly predicted home FV availability ($p<.01$). However, when adding the 4 conditions (which showed no main effect) as an interaction term, the influence of asking behaviors on home availability was no longer significant.

Conclusion: Positive effects of increased child's FV asking behavior for home FV availability were observed at follow-up, but not when taking the interaction with the different conditions into account.

S3.4. SYMPOSIUM:

Exploring the behavioural and health impacts of children's energy-dense food marketing exposure using a structured logic model

Chair: Bridget Kelly, University of Wollongong, NSW, Australia

S3.4.1

A 'logic model' to link unhealthy food promotion to childhood obesity

Bridget Kelly¹, Lesley King², Kathy Chapman³, Emma Boyland⁴, Adrian Bauman², Louise Baur⁰
¹University of Wollongong, Wollongong, NSW, Australia,
²University of Sydney, Sydney, NSW, Australia, ³Cancer Council NSW, Sydney, NSW, Australia, ⁴University of Liverpool, Liverpool, UK

SIG: Yes, Policies and environments

Awards:

Objective: Children's exposure to unhealthy food marketing is thought to contribute to poor diets and overweight. Evidence to support the relationship between marketing exposure and health-related outcomes is required to inform prevention efforts. We assessed the evidence for a conceptual hierarchy of effects ('logic model') of marketing, to guide understanding of these relationships, and to drive the research and policy agenda. A similar hierarchy of effects model has been used to underpin social marketing, but this is the first time such a model has been used to project the way in which commercial marketing is linked to behaviour and post-consumption outcomes.

Methods: A narrative review of studies assessing the impact of food promotions on children was undertaken. Included articles were published in English from 2009-2013, with earlier articles captured from a 2009 systematic review. Articles were grouped by outcome of exposure, including studies assessing the impact of marketing on brand awareness, preferences, purchases and consumption. These outcomes were assessed within a framework depicting a hierarchy of effects of the impacts of marketing exposures.

Results: Evidence supports a logical sequence of effects linking food promotions to individual-level weight outcomes. Research can test marketing effects along this hierarchy. Future studies should demonstrate the sustained effects of marketing exposure, and exploit variations in exposures to assess differences in outcomes longitudinally.

Conclusions: This framework identifies relationships in a hierarchical manner, covering 'upstream' impacts, such as attitudinal responses, and 'downstream' effects including behaviour and weight. This review and framework assist research synthesis and policy development.

S3.4.2

The impact of food and beverage advertising to children on food preferences, choices and consumption: evidence from a series of UK studies of marketing exposure and power

Emma Boyland
 University of Liverpool, Liverpool, UK

SIG: Yes, Policies and environments

Awards:

Objective: The potential impact of unhealthy food marketing on children is a function of both exposure (prevalence of promotions for unhealthy food products) and power (the content of the marketing message, determining its persuasive effect). Evidence to demonstrate each of these facets is required to monitor and evaluate current regulatory practice, but also to support the introduction of policies where they do not currently exist. The purpose of this talk will be to explore: 1) the exposure of children to food advertising within the context of a changing regulatory landscape (using the UK as an example), 2) the power of that advertising (e.g. the use of persuasive techniques), 3) the effect on food preferences, choices and consumption.

Methods: A series of experimental studies were conducted with children aged 6-13 years, typically using the framework of a robust, within-subjects, counterbalanced cue-exposure paradigm. In this paradigm, children were exposed to both food and non-food (toy) advertising followed in each instance by the administration of a food preference checklist, forced food choice measures or an *ad-libitum* eating opportunity. In addition, large content analyses of both TV food advertising and in-store promotional marketing aimed at young people were conducted.

Results: Despite the introduction of statutory legislation governing the advertising of high fat, sugar and salt (HFSS) foods on TV in the UK, children are still exposed to extensive promotion of these foods and techniques of particular appeal to children are still evident and highly effective. All children over consume after exposure to food advertising. However, highly neophobic children (those with a high level of fear of new foods), overweight and obese children and those who habitually watch a lot of commercial television may be most susceptible to the detrimental dietary effects of exposure.

Conclusions: Acute, experimental food advert exposure promotes consumption and affects food preferences towards energy-dense product categories. This, along with other factors, may contribute to the energy imbalance that leads to weight gain and poor health in children. Regulation can be useful but the current UK system has notable gaps. The implications for policy in the UK and elsewhere will be discussed.

S3.4.3

Child-targeted marketing in the supermarket and product purchasesJennifer Harris*Yale University, New Haven, CT, USA***SIG:** Yes, Policies and environments**Awards:**

Objective: Worldwide, food industry self-regulation to reduce unhealthy food marketing to children does not address child-targeted marketing in the supermarket. However, children significantly influence their parents' food purchases. Further, food companies in the U.S. devote 10% of their child-targeted marketing expenditures to in-store marketing. Presumably this strategy is effective, but existing independent research is limited. Our research examines the extent and impact of in-store marketing for children's products.

Methods: In two studies, we compared marketing strategies for children's versus adult-targeted products in the supermarket, including shelf-space allocation, special displays, and price promotions, and differential impact on product sales. In Study 1, we conducted in-store audits of a national sample of 400 supermarkets to quantify shelf placement, number of facings, special displays (in-aisle, end cap, freestanding, other), and price promotions devoted to children's cereals versus adult-targeted products. In Study 2, we examined scanner data for fruit drinks and juices and compared incremental sales due to pricing and display promotions for children's products versus other products.

Results: Children's cereals were featured significantly more often in supermarket special displays compared with adult and family cereals, they averaged 50% more facings per product, and they were more likely to be placed on the middle and bottom shelves (i.e., the most visible placement for adults and children). In addition, there were significantly more price promotions for children's compared with other cereals. Further, 18% of sales of children's drinks were attributed to price promotions and 9% to special displays, a significantly higher proportion compared with sales of comparable adult drinks. In both studies, these effects occurred for products from major manufacturers, but not smaller specialty companies.

Conclusions: High-sugar cereals targeted to children receive prime shelf placement and additional promotion in the supermarket compared with adult-targeted cereals. Further, special displays and price promotions contribute a greater percentage of sales for children's drinks than for adult drinks. Although supermarket promotions likely affect both children and adults, these results confirm that in-store marketing is an important strategy for increasing sales of children's products. Industry self-regulation should limit unhealthy marketing to children in stores as well as other venues.

S3.4.4

Individual susceptibility to food advertising among childrenFrans Folkvord*Behavioural Science Institute (BSI), Radboud University of Nijmegen, Nijmegen, The Netherlands***SIG:** Yes, Policies and environments**Awards:**

Objective: Since food related advertisements are omnipresent and integrated in children's media environment, it is important to examine how these advertisements influence children's consumption behaviour. Possible factors that could explain individual susceptibility to food advertising among children are impulsivity, self-control, and attentional bias. While most research has focused on traditional advertising (e.g. television advertising), food marketing is expanding and constantly renewing because of the occurrence of new forms of media (e.g., online games). In our studies, we mainly focus on new forms of food marketing, like advergames promoting energy-dense snacks.

Methods: Different experimental studies with large groups of young children (6-10 y) were conducted to test the effect of advergames promoting energy-dense snacks on the actual food intake of children. We tested the effects of these advergames on snack intake with possible moderating factors (i.e. impulsivity, self-regulation, attentional bias). We found that these factors moderate the effect of food advertisements on children's unhealthy food consumption.

Results: Our findings show that advergames that promote energy-dense snacks or fruit induce unhealthy snack intake among children. Furthermore, food cues in advergames hamper self-regulating when children are rewarded to refrain from eating energy-dense snacks. Especially impulsive children showed more difficulties in refraining from eating while playing an energy-dense advergame. Next, children with an attentional bias for food cues in an advergame promoting energy-dense snacks ate more calories than children with no attentional bias for food cues. Finally, overweight and hungrier children had an attentional bias for the food cues compared to normal weight and less hungry children, thereby indicating that they have more difficulties with inhibiting their responses to the food cues.

Conclusions: Assessing the influence of industry-developed food cues should be considered a central factor of understanding the environment and its relationship with the obesity rates nowadays. While people are evolutionary equipped for times of scarcity, we are constantly surrounded by plenty food images and videos of high caloric and tasty snacks. This makes it much more difficult for children to lose weight or maintain a healthy eating pattern. Especially for the children who are more susceptible to these food advertisements.

S1.5. DEBATE: A Tale of Two Dietary Methodology Perspectives

Chair: Linda Nebeling, National Cancer Institute, Bethesda, MD, USA

S1.5.1

Utility of Short Dietary Screeners to Assess Patterns as “Proxy” for Dietary Behaviors

Amy Yaroch
Gretchen Swanson Center for Nutrition, Omaha, NE, USA

SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Although longer, more comprehensive measures exist to assess dietary behaviors, brief measures, such as dietary screeners are available as a viable alternative for dietary assessment. Specifically, these dietary screeners (which can be as short as 1 item and vary in length up to about 30 items) are used to assess dietary patterns, which can serve as a “proxy” for dietary behaviors, especially when energy and nutrient values are not needed for intervention and/or surveillance research and longer, more comprehensive assessments are cost prohibitive.

Results: Although measurement error has been shown in the use of dietary screeners, all self-reported dietary assessment methods have some bias associated with their use. Unlike physical activity, where accelerometers exist to objectively measure physical activity, there is currently no unobtrusive purely objective method available for diet. Therefore, in cases where time, cost, and burden become factors in determining the type of dietary assessment selected, screeners exist as a viable alternative, not in measuring behavior but rather assessing dietary patterns (e.g., frequency of less healthful items, such as sugar sweetened beverages versus more healthful items, such as fruits and vegetables).

Conclusions: All self-report dietary assessment methods currently available, both more comprehensive and briefer methods have inherent limitations. When selecting the appropriate method either for intervention and/or surveillance purposes, it is recommended to pick a measure to be commensurate with the ultimate goal for its usage. Put more simply, if the goal is to assess dietary patterns (e.g., frequency of consuming more healthful vs. less healthful food and beverage items) rather than intake (e.g., energy and nutrient values), dietary screeners are not only a viable alternative, but are the more suitable measure.

S1.5.2

The case for the use of comprehensive measures of dietary intake in nutrition research

Sharon Kirkpatrick
School of Public Health and Health Systems, University of Waterloo, ON, Canada

SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: A major challenge in better understanding the diet-health nexus and how to intervene to improve diet among populations is bias in self-report measures of dietary intake. Although biomarkers reflecting true intake have been identified for a few dietary components, their widespread use is limited by the expense and burden involved. Thus, self-report instruments remain the typical method of choice. Much research makes use of brief instruments, often called screeners, given that these have traditionally been less expensive and impose lower respondent and investigator burden relative to more comprehensive methods (e.g., 24-hour recalls).

Results: The widespread use of brief instruments is of concern since, although all self-report dietary assessment instruments are affected by bias, data from brief instruments appear to be less accurate in capturing true intake than are data collected using more comprehensive methods. The greater degree of bias associated with brief instruments can lead to spurious effects and ultimately, to an inconsistent evidence base, hindering policy and program recommendations to improve diets and health. There are some cases in which it may be appropriate to use a brief tool; for example, if interest is in one or a few dietary components that are concentrated in relatively few food/beverage sources (e.g., soda). It is also possible to use corrective strategies to reduce bias in estimates from screeners, though this requires data from a more comprehensive method. However, the application of technology (for example, to create a web-based self-administered 24-hour recall) means that it is now increasingly feasible to collect comprehensive and high-quality data as the main dietary measure across a range of research studies. The use of more accurate methods can only advance our understanding of strategies to improve diet.

Conclusions: The tendency toward the use of brief dietary assessment instruments limits what we can learn from research. The use of technology to enhance our ability to collect more detailed dietary data is a promising step toward an improved understanding of the influences of diet on health and the impact of interventions to shift dietary intake and improve health.

S2.5. SYMPOSIUM:

Environmental interventions to increase physical activity in youth.

Chair: Jenny Veitch, Deakin University, Melbourne, Australia

S2.5.1

Organizing “Play Streets” during school vacations can increase physical activity and decrease sedentary time in children

Sara D’Haese, Delfien Van Dyck, Ilse De Bourdeaudhuij, Benedicte Deforche, Greet Cardon
Ghent University, Ghent, Belgium

SIG: Yes, Policies and environments

Awards:

Purpose: A Play Street is a street that is reserved for children’s safe play for a specific period during school vacations. It was hypothesized that a Play Street near children’s home can increase their moderate- to vigorous-intensity physical activity (MVPA) and decrease their sedentary time. Therefore, the aim of this study was to investigate the effect of Play Streets on children’s MVPA and sedentary time.

Methods: A nonequivalent control group pretest-posttest design was used to determine the effects of Play Streets on children’s MVPA and sedentary time. Data were collected in Ghent during July and August 2013. The study sample consisted of 127 children (54 from Play streets, 73 from control streets). Children wore an accelerometer for 8 consecutive days and their parents filled in a questionnaire before and after the measurement period. During the intervention, streets were enclosed and reserved for children’s play. Four-level (neighborhood - household - child - time of measurement (no intervention or during intervention)) linear regression models were conducted in MLwiN to determine intervention effects.

Results: Positive intervention effects were found for sedentary time ($\beta=0.65\pm0.27$; $\chi^2=6.0$; $p=0.02$) and MVPA ($\beta=-0.72\pm0.31$; $\chi^2=5.5$; $p=0.02$). Between 14h00 and 19h00, MVPA from children living in Play Streets increased from 27 minutes during normal conditions to 36 minutes during the Play Street intervention, whereas control children’s MVPA decreased from 27 to 24 minutes. Sedentary time from children living in the Play Street decreased from 144 minutes during normal conditions to 138 minutes during the Play Street intervention, whereas control children’s sedentary time increased from 156 minutes to 164 minutes. The intervention effects on MVPA ($\beta=-0.62\pm0.25$; $\chi^2=6.3$; $p=0.01$) and sedentary time ($\beta=0.85\pm0.0.33$; $\chi^2=6.6$; $p=0.01$) remained significant when the effects were investigated during the entire day, indicating that children did not compensate their increased MVPA and decreased sedentary time, during the rest of the day.

Conclusions: Creating a safe play space near urban children’s home by the Play Street intervention is effective in increasing children’s MVPA and decreasing their sedentary time.

S2.5.2

Feasibility and effectiveness of drop-off spots to promote walking to school

Griet Vanwolleghem¹, Sara D’Haese^{1,2}, Delfien Van Dyck^{1,2}, Ilse De Bourdeaudhuij¹, Greet Cardon¹
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Background: Drop-off spots are locations in the proximity of primary schools where parents can drop off or pick up their child. From these drop-off spots children can walk to and from school. This pilot study aimed to investigate the feasibility and effectiveness of drop-off spots and to evaluate how drop-off spots are perceived by school principals, teachers and parents of 6-to-12-year old children.

Methods: First, a feasibility questionnaire was completed ($n=216$) to obtain parental opinions towards the implementation of drop-off spots. A drop-off spot was organized (500-800 m distance from school) in two primary schools. A within-subject design was used to compare children’s ($n=58$) step counts and number of walking trips during usual conditions (baseline) and during implementation of a drop-off spot (intervention). Three-level (class-participant-condition) linear regression models were used to determine intervention effects. After the intervention, 2 school principals, 7 teachers and 44 parents filled out a process evaluation questionnaire.

Results: Prior to the intervention, 96% expressed the need for adult supervision during the route to school. Positive significant intervention effects were found for step counts before/after school hours (+732 step counts/day; $X^2=12.2$; $p<0.001$) and number of walking trips to/from school (+2 trips/week; $X^2=52.9$; $p<0.001$). No intervention effect was found for total step counts/day ($X^2=2.0$; $p=0.16$). The intervention was positively perceived by the school principals and parents, but teachers expressed doubts regarding future implementation.

Conclusion: This pilot study showed that implementing drop-off spots might be an effective intervention to promote children’s walking to school. Implementing drop-off spots does not require major efforts from the schools and schools can choose how and when they organize drop-off spots. However, motivating teachers and involving other volunteers (e.g. parents, grandparents) may be needed. Future studies should investigate the feasibility and effectiveness of drop-off spots in a larger sample of schools.

S2.5.3

The associations between the availability of neighborhood fitted Krajscek playgrounds, and physical fitness, body composition and physical activity behavior of adolescents.

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Department of Public & Occupational Health and EMGO Institute for Health and Care Research, VU University Medical Center, Amsterdam, The Netherlands

SIG: Yes, Policies and environments

Awards:

Purpose: Neighborhood characteristics such as proximity to physical activity (PA) facilities have been identified as important factors that influence adolescents' PA, which are often absent in low socio-economic neighborhoods. The Richard Krajscek Foundation tailors and places playgrounds (Krajscek playgrounds) in such disadvantaged neighborhoods with an aim to increase the PA of adolescents. Krajscek playgrounds consist of infrastructure, and additionally provide supervision combined with organization of events and loose equipment. The effect of this approach on PA levels has, to date, not been established. The aim of this study was to examine the associations between the availability of Krajscek playgrounds and the physical fitness (PF) and PA behavior of adolescents.

Methods: 2,098 adolescents (1,139 boys, 959 girls; mean age=13.9±1.2y) from 9 secondary schools in the Netherlands participated in this cross-sectional study. PA- and sedentary behaviors were registered through questionnaires. PF was assessed using the EUROFIT test battery. Height, weight, age and gender were used to calculate age and gender adjusted BMI. A cut off point of 0.5-mile walking distance from home to a Krajscek playground was employed to distinguish between adolescents who live in proximity of a Krajscek playground and those who do not. MLwiN was used to conduct 3-level multilevel regression analyses, adjusting for clustering within school and classes.

Results: With adjustment for relative confounders, adolescents living in the proximity of a Krajscek playground participated in more hours of afterschool activities ($\beta=1.6$; 95% CI 1.2-2.3). Additionally, they report more hours of organized sports ($\beta=0.6$; 95% CI 0.08-1.04) and watched 18.5 minutes [95% CI -31.9 - -5.1] less of TV during weekend days. Living in the proximity of a Krajscek playground also significantly increases the odds of using the Krajscek playground (OR=4.5 (95% CI 2.9-6.9)). No differences were found in any of the tests for PF or in the body composition of the adolescents.

Conclusions: Although living in the proximity of a Krajscek playground improves PA behavior of adolescents, no difference was found for PF. This might imply that the positive impact that Krajscek playgrounds have on PA is not substantial enough to make a difference in PF.

S2.5.4

The effect of schoolyard interventions on moderate-to-vigorous physical activity and sedentary behavior of elementary school children

Dave Van Kann¹, Jasper Schipperijn², Sanne de Vries³, Nanne de Vries¹, Maria Jansen¹, Stef Kremers¹
¹Maastricht University, Maastricht, The Netherlands, ²University of South Denmark, Odense, Denmark, ³The Hague University of Applied Sciences, The Hague, The Netherlands

SIG: Yes, Policies and environments

Awards:

Objective: Regular physical activity (PA) is important for children. Yet, children's levels of PA are decreasing while levels of sedentary behavior are increasing in the last decades. The development of a healthy PA pattern is essential for a healthy lifestyle in later life. All children spend a substantial daily amount of time at school, indicating the importance of the school environment on children's physical activity levels. The school environment can contribute to daily physical activity by consisting of a supportive physical and social environment. To increase children's PA levels, several schoolyards in Dutch elementary schools have been upgraded to become more PA supportive environments. This study focuses on the effects of these schoolyard interventions on moderate-to-vigorous physical activity and sedentary behavior of 9-to-12 years old children.

Methods: Sixteen schools were included in this quasi-experimental study. Eight schools were intervention schools and their schoolyards were upgraded to become a more PA-supportive environment, whereas the other eight schools were control schools that were not subject to any schoolyard changes. At baseline (Spring, 2013) 137 children wore an accelerometer (Actigraph, GT3X+) and a GPS-device (Qstarz, BT1000) and 527 children wore both devices after implementing the environmental changes (Spring, 2014). Accelerometer and GPS data were combined using the Personal Activity and Location Measurement System (PALMS). Data was aggregated to a 15-second epoch. All schoolyards were digitalized in GIS (ArcGIS, version 10.2) and including PALMS-data in GIS defined for every epoch whether children were present in the schoolyard environment and their activity level. Data were gathered in matches of intervention and control schools, correcting for possible confounding influences such as weather conditions. A pretest-posttest design will be used to study the effectiveness of the schoolyard interventions controlling for contextual confounders, such as schoolyard characteristics.

Results: Effectiveness of schoolyard interventions will be presented by comparing intervention and control schools. Children's PA levels and sedentary behavior will be presented for pretest, posttest and change-scores between pre- and posttest.

Conclusions: The effectiveness of the schoolyard interventions will be discussed in a broader contextual perspective. Recommendations for future interventions and research will be presented.

S3.5. SYMPOSIUM:

Restructuring the classroom environment to reduce sedentary behaviour: Evidence from primary and secondary school interventions across the globe

Chair: Stacy A Clemes, Loughborough University, Loughborough, Leicestershire, UK

S3.5.1

The use of sit-to-stand desks to reduce classroom sitting: Evidence from a diverse sample of children from the UK and Australia

Sally Barber¹, Stacy Clemes², Daniel Bingham^{1,2}, Nicola Ridgers³, Elly Fletcher³, Natalie Pearson², Jo Salmon³, David Dunstan^{3,4}
¹Bradford Institute for Health Research, Bradford, West Yorkshire, UK, ²Loughborough University, Loughborough, Leicestershire, UK, ³Deakin University, Melbourne, Victoria, Australia, ⁴Baker IDI Heart and Diabetes Institute, Melbourne, Victoria, Australia

SIG: Yes, Policies and environments

Awards:

Purpose: To compare the influence of sit-to-stand desks on classroom sitting time between primary school children in the UK and Australia.

Methods: Fifty-four children were recruited from two Year 5 classes (9-10 year olds) in a primary school located in a low socio-economic status (SES) and multi-ethnic area of Bradford, West Yorkshire, UK. Forty-eight children were recruited from two Year 6 classes (11-12 year olds) in a primary school located in a middle-high SES area of Melbourne, Victoria, Australia. Data collection procedures were identical in both schools. Children wore an activPAL3 for seven days and height and weight were measured at baseline and at 8 weeks follow-up. In each school, one class was randomly allocated to receive sit-to-stand desks for one term. Due to space constraints in the UK classroom, six sit-to-stand desks replaced a bank of standard desks. Children rotated around to ensure exposure for at least 1 hour/day. In the Australian classroom each child had their own sit-to-stand desk. Classroom sitting times were compared pre and post intervention for the intervention and control groups at each school.

Results: Thirty UK and 44 Australian children provided valid activPAL data at baseline and follow-up. Children from both countries spent 5 hours/day in the classroom. At baseline, there were no significant differences in classroom sitting time between the UK (200±48 mins/day, 70% of classroom wear time) and Australian (203±22 mins/day, 69% of classroom wear time) children. The proportion of time spent sitting in class decreased significantly at follow-up in both intervention groups (UK: -9.8±16.5% [-52.4±66.6 mins/day] n = 16; Australian: -9.4±10% [-43.7±29.9 mins/day] n = 24). No significant changes in classroom sitting time were observed in the UK control group (n = 14), while a significant reduction was observed in the Australian control group (-5.9±11.7% [-28.2±28.3 mins/day] n = 20).

Conclusions: Despite differences in the implementation of sit-to-stand desks, similar reductions in classroom sitting were observed for both intervention groups. Incorporating sit-to-stand desks into classrooms appears to be an effective way of reducing classroom sitting time in children from a range of socio-economic groups and cultures.

S3.5.2

Up & Learn! a pilot study examining the feasibility of height-adjustable desks in an Australian secondary school classroom

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¹Deakin University, Melbourne, Victoria, Australia, ²Baker IDI Heart and Diabetes Institute, Melbourne, Victoria, Australia

SIG: Yes, Policies and environments

Awards:

Purpose: Recent research suggests that prolonged sitting is a risk factor for various chronic health conditions. Adolescents spend more than 60% of their waking hours sitting, with much of this occurring in the classroom. Simple changes to the classroom to reduce prolonged sitting may have substantial effects on young people's health and learning outcomes across their secondary school years. The primary aim of this study was to examine the feasibility of height-adjustable desks in a secondary school students' classroom and whether the desks resulted in decreased sitting and increased standing (sitting breaks) and stepping. Secondary aims included examining Principals' (n=2), teachers' (n=3-10) and students' (n=45) perceptions regarding use and feasibility of height-adjustable desks in classroom lessons, and examining the feasibility of a measure of student's cognitive ability (CANTAB; n=5).

Methods: Students wore an accelerometer and inclinometer for five consecutive school days, and completed a survey regarding their perceptions and use of height-adjustable desks during classroom lessons. Of these students, half (n=23) completed these outcomes at baseline and again after the desks were placed in the classroom. Teachers' perceptions regarding the favourable and challenging aspects of the height-adjustable desks upon students' energy levels, behaviour, school work, and use, were examined. Interviews were also conducted with the secondary schools' Principals to examine feasibility from a management perspective.

Results: Preliminary results suggest that perceptions regarding the use of the height-adjustable desks are variable with some students welcoming the opportunity to stand during class and other students not wanting to use the standing feature of the desks. Some teachers were more supportive than others with challenges in doing group work and the large amount of space the desks take up in the classroom being some unfavourable feedback.

Conclusions: This study will enhance understanding of the feasibility of height-adjustable desks in secondary schools and their potential influence on adolescents' physical activity, sedentary behaviour and certain cognitive outcomes during classroom lessons. The results will inform the viability of future research examining the longer term effects on these outcomes.

S3.5.3

A 2-year evaluation of a High School Standing Desk Intervention to Reduce Sedentary Behavior in US Children

Mark Benden, HongWei Zhao, Drew Schneider
Texas A&M University, College Station, Texas, USA

SIG: Yes, Policies and environments

Awards:

Purpose: The primary purpose of our study was to evaluate the impact on sedentary behavior of a standing desk intervention in a High School Environment. The author and others had performed similar studies with elementary age students but not with High School Students. The study is innovative in its design since it included the classrooms of all 300 students.

Methods: The study used a pre/post design where students served as their own controls in year 1 and a follow up of those same students in Year 2 to test for the sustainability of results. 300 students were provided with standing desks equipped with foot rails and stools for sitting. Primary measures of interest included accelerometry and inclinometry by ActivPal wearable monitors combined with subjective surveys of teachers and students. Test scores on college exams and state standardized testing were also compared to pre-intervention levels. A random sample of 100 students were consented, surveyed, sampled and incentivized to participate.

Results: Paired comparisons revealed that the average energy expenditure, steps and standing time was significantly higher in school year 1 when subjects were using the standing desks in the spring vs. the seated desks in the fall ($p < 0.0001$). Sedentary time was reduced by 11% and mean steps were increased by 35%. Year 2 monitoring of the students in a second school year has not yet revealed reversal of the year 1 level increases. Teacher interviews revealed strong belief in the teaching value of the standing desks for engagement and classroom management. Year-over-year test score increases on PSAT and state STARR exams were the highest in the district.

Conclusions: Health interventions in schools must “pass the test” of being affordable, and sustainable while clearly being of academic value to teachers and administrators. Standing desks in schools offer the option to students to sit on a stool or stand at will, thus reducing sedentary behaviors while providing value to teachers in the form of academic capital - an equally critical component in determining long term viability for this particular intervention.

S3.5.4

Exploring the behavioural, health, learning and social effects of a dynamic classroom environment in New Zealand primary school children

Erica Hinckson, Saeideh Aminian, Sigrid Norris, Leon Benade
Auckland University of Technology, Auckland, New Zealand

SIG: Yes, Policies and environments

Awards:

Purpose: We tested the effectiveness of a “dynamic classroom” environment in increasing children’s standing and reducing sitting and explored the learning and social effects of this environment.

Methods: Study 1: a small controlled trial with 26 ($n=18$ intervention) children (age 9.8 ± 0.4 years; BMI 23 ± 7.8 kg/m²) was conducted in two primary schools from similar socio-economic backgrounds in Auckland, New Zealand. Traditional desks and chairs were replaced with height-adjustable workstations over two school terms (22 weeks) while control classes retained traditional seated desks and chairs. Children’s sitting and standing were monitored using the ActivPAL accelerometer at three time points (baseline, weeks 5 and 9). Pain, inattention and hyperactivity/impulsivity were also assessed. At week 22, an evaluation was conducted via interviews and focus groups. Paired t-tests compared the frequency of reported pain, inattention and hyperactivity/impulsivity. The main themes emerging from the interviews and focus groups were explored using thematic analysis. Study 2: the sample consisted of four classrooms (one intervention and one control at two different schools of low and high socio-economic background). By providing standing workstations, and the incorporation of active breaks by teachers during classroom time, habitual activity in children (standing/walking) was encouraged over sedentary behaviour. Sitting, standing and walking was objectively monitored using the ActivPAL at baseline and during the intervention. Social and learning interactions were monitored through video ethnography before and during incorporation of the workstations. Teaching and learning influences were assessed through interviews with teachers. Multimodal transcripts were used to analyse naturally occurring interactions.

Results: There was a large increase in overall standing of ~1 hour/day over nine weeks of the intervention in Study 1, compared to the control classroom. Children’s overall sitting time reduced but the changes were small and unclear (15 37 min). There were no differences between the control and intervention classrooms in musculoskeletal pain, inattention and hyperactivity/impulsivity. Children enjoyed working at the height adjustable workstations. Teachers were supportive of the dynamic classroom environment as it offered increased space, social interactions, happier children, and easier supervision.

Conclusions: Height adjustable workstations can be successfully integrated into classroom environments to increase overall standing and decrease sitting in children.

S4.5. SYMPOSIUM: Cooking and cooking skills interventions

Chair: Martin White, University of Cambridge, Cambridge, UK

S4.5.1

Does cooking matter? Associations between home meal preparation, energy intake, and obesity among US children and adults

Lindsey Smith
University of North Carolina, Chapel Hill, North Carolina, USA

SIG: Yes, Children and families

Awards:

Purpose: Public health experts increasingly advocate cooking as a strategy for improving diet and preventing overweight/obesity. Little work has examined the association between home meal preparation, diet, and weight status among US children and working-age adults. A second question is whether these associations are stronger for households in the Supplemental Nutrition Assistance Program (SNAP), who must cook from scratch in order to meet the requirements of the Thrifty Food Plan.

Methods: We pooled data from the 2007-2008 and 2009-2010 National Health and Nutrition Surveys for children age 2-18y (n=6291) and working age adults age 25-65 (n=3947). Using logistic regression, we examined the association between daily household cooking and family meals with total energy intake and overweight/obesity (OVOB). We tested whether this relationship differed by whether the household had received SNAP benefits within the prior year. We use sampling weights to adjust results to be nationally representative and account for potential selection bias in completing physical measurements.

Results: For children, daily cooking was associated with a decreased likelihood of OVOB compared to less frequent cooking (32% vs. 36%, $p < 0.05$). This relationship was stronger for children in SNAP-recipient households (30% vs. 38%, $p < 0.05$ for interaction term). For women on SNAP, cooking was associated with a decreased likelihood of cooking (73% vs. 82%) whereas for women not on SNAP, there was no association of cooking with OVOB. For men, household cooking was not associated with OVOB. For children, daily household cooking was not associated with total daily energy intake. For both women and men, daily cooking was associated with decreased total daily energy intake (1755 kcal vs. 1844 kcal for women, 2496 kcal vs. 2617 kcal for men). The effect of daily cooking on daily energy intake was weaker among female SNAP-recipients, but stronger among male SNAP-recipients.

Conclusions: Household daily cooking is associated with decreased likelihood of OVOB among US children and women, but not men. Daily cooking appears to be more protective against OVOB among households receiving SNAP. One mechanism for this effect may be through lowering daily energy intake. Longitudinal work is needed to explore if this link is causal.

S4.5.2

Evaluation of a UK-based cooking skills intervention: qualitative results

Richard Purves
University of Stirling, Stirling, UK

SIG: Yes, Children and families

Awards:

Purpose: To determine whether cooking skills interventions are likely to lead to dietary improvements and whether robust evaluation of cooking skills interventions is both practical and feasible. This paper will report on the qualitative components of a pilot study that simulated a proposed definitive RCT of a cooking skills intervention. The pilot study included a pilot economic evaluation and embedded process evaluation with qualitative components.

Methods:

Interviews and focus groups were conducted with cooking skills intervention participants and key stakeholders identified during informal discussions with the project lead at Jamie Oliver's Ministry of Food to explore the feasibility and acceptability of the cooking skills intervention and research methods, and to explore factors influencing successful implementation of the intervention and research methods, and engagement in both. Three qualitative exercises were conducted:

- Individual interviews with cooking skills intervention participants
- Focus groups with cooking skills intervention participants
- Individual interviews with cooking skills intervention stakeholders

Results:

In the presentation we will report findings on: the consequences, both expected and unexpected, of cooking skills interventions for UK adults, as identified by cooking skills intervention participants and providers, the practicality and acceptability of cooking skills interventions for UK adult participants as well as those involved in commissioning and delivery, the practicality and acceptability of the research methods proposed for a definitive RCT of a multi-site cooking skills intervention, for both UK adult participants as well as those involved in commissioning and delivery, and what factors may affect non-recruitment, attrition, attendance and compliance with data collection methods.

Conclusions:

This research will contribute to the government's ambition to increase the evidence base for a range of comprehensive and integrated 'real-life' interventions, that can be implemented nationally, and that will contribute towards influencing a downward trend in the level of excess weight in adults and children by 2020. The intervention aligns with the governments' preference for less intrusive interventions that are based on empowerment of individuals to take responsibility for their own health and wellbeing.

S4.5.3

Jamie's Ministry of Food Australia: immediate and sustained impacts of a quasi-experimental evaluation

Anna Flego, Jessica Herbert
Deakin University, Melbourne, Australia

SIG: Yes, Children and families

Awards: No

Purpose: A lack of cooking skills and cooking confidence has been associated with poor food choices and higher consumption of foods prepared outside of the home. Reduced opportunities to learn to cook have contributed to declining cooking skills. As a result, community based cooking skills programs have proliferated, aiming to promote cooking skills and cooking confidence.

Whilst Jamie's Ministry of Food is the most well-known cooking skills program, it has not yet been formally evaluated. This study evaluates the immediate and sustained effectiveness of the first Jamie's Ministry of Food Program in Australia on individuals' cooking confidence and cooking/eating behaviours.

Methods: The evaluation used a quasi-experimental repeated measures design. Adult participants who registered for the program from November 2011 - December 2013 were invited to participate. A questionnaire was administered at baseline (T1), immediately post program (T2) and 6 months post completion (T3) for participants allocated to the intervention group, while wait list controls completed it 10 weeks prior to program commencement (T1) and at program commencement (T2). A linear mixed model approach was used to determine mean differences within and between groups over time.

Major findings: Intervention group assessment completion: 694 (T1), 383 (T1 + T2), 214 (T1, T2 + T3); control group: 237 (T1) and 149 (T1 + T2). Statistically significant increases within the intervention group ($p < 0.001$) and significant group*time interaction effects ($p < 0.001$) were found in all cooking confidence measures between T1 and T2 as well as cooking from basic ingredients, frequency of eating vegetables with the main meal and daily vegetable intake (0.52 serves/ day increase). Statistically significant increases at T2 were sustained at T3 in the intervention group. Whilst overall weekly food expenditure did not change, a sustained increase in mean weekly fruit and vegetable expenditure ($p < 0.001$) in the intervention group was matched by a sustained decrease in take away/fast food expenditure ($p < 0.001$) at T3.

Conclusions: Jamie's Ministry of Food Program improved participants' cooking confidence and cooking/ eating behaviours and is a promising population strategy to influence healthy eating.

S5.5.SYMPOSIUM:

Utilizing social networks for physical activity and dietary behavior change

Chair: Ruth F Hunter, Queen's University Belfast, Belfast, County Antrim, UK

S5.5.1

Utilizing social networks for physical activity behavior change: a conceptual model

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²Queen's University Belfast, Belfast, Northern Ireland, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Although current social-ecological models identify interpersonal-level phenomena as a component in understanding physical activity, there are two key issues. Firstly, interpersonal-level factors (e.g., social network structure) are often confused with psychosocial processes (e.g., social support), which are fundamentally different concepts. Such confusion can lead to physical activity interventions that fail to leverage social network-level factors that have strong potential to facilitate physical activity initiation and maintenance. Secondly, current health behavior change models do not elaborate upon the processes and mechanisms through which interpersonal-level factors impact behavior. Consequently, interpersonal factors such as social networks, which have implications for individual, community, organization and population level behavior change, have been somewhat overlooked and underutilized in physical activity research. Therefore, the aim of this presentation is to present a unified conceptual model of how social networks impact physical activity.

Methods: We developed a unified conceptual model detailing the current evidence of how social networks impact physical activity at the individual, community, organizational and population level following a review of existing models and mechanisms of social networks and health behavior change.

Results: The unified conceptual model makes three fundamental developments to existing models. Firstly, it includes network-level factors of the social network itself, such as cohesion, which have been found to be robust predictors of physical activity. Secondly, the model clarifies definitions of social network and interpersonal phenomena that distinguish between concepts at the interpersonal and broader social levels. Lastly, the model details how social networks can be applied at the individual, community, organizational and population level to design, implement and evaluate social network enabled behavior change interventions. Examples include changing the structure or function of existing networks or purposeful development of new social networks.

Conclusion:

The unified conceptual model provides conceptual clarity with regards to social networks and how they impact physical activity, and is pertinent to the development and implementation of social network enabled interventions at the individual, community, organizational and population level. Although specifically discussing physical activity behavior change this model can be modified for use for other health behaviors such as diet.

S5.5.2

Families SHARE: Activating social networks to promote healthy diets and reduce disease risk

Kayla de la Haye¹, Carlene Wilson², Andrea Goergen³, Ivanka Prichard², Amanda Hutchinson², Donna Hughes², Laura Koehly³
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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Genetic, behavioral, and environmental risk factors for etiologically complex diseases, such as heart disease, diabetes, and some cancers, tend to cluster in families, making them important social contexts for lifestyle-focused disease prevention. "Families SHARE" is an educational tool that provides families with feedback about disease risk based on their family health history and behavioral strategies (including dietary and physical activity recommendations) to modify disease risk. Families SHARE is based on a communal coping model and family-systems approach, and is hypothesized to activate features of family social networks--including communication, encouragement, and collective action--that support the adoption of recommended health behaviors among family members. This study evaluates the feasibility and initial efficacy of Families SHARE among diverse populations in the US and Australia.

Methods: African American (N = 51) and diverse Australian (N = 350) adult family members were recruited to test the intervention. Qualitative and quantitative methods, including social network analysis (SNA), are applied to evaluate families' response to, and use of, the intervention material. SNA is used to map multiple dimensions of families' social networks and changes in the characteristics of these networks over time. We evaluate (a) increases in communication about family health and disease, (b) activation of health-support relationships (e.g., encouragement and co-engagement in healthy behaviors), and (c) the role of these social networks in supporting families' adoption of recommended dietary and physical activity behaviors.

Results: Findings show that the information promoted in the Families SHARE tool is shared among participants' family members and broader social network, and stimulates communication about health and disease risk and a sense of ownership of this knowledge. Participants report diverse family structures and health support networks, which are linked to health behaviors and intentions for behavior change. We find evidence of increased intentions and self-efficacy to increase intake of fruits and vegetables, and engage in physical activity.

Conclusions: Families SHARE shows promise in activating a communal coping response and social network characteristics that can promote and sustain healthy diets and physical activity within diverse families. Opportunities to refine the tool for different cultures and family structures are discussed.

S5.5.3

Leveraging social networks to increase physical activity in the afterschool setting

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Novel interventions that intentionally leverage social networks to increase physical activity are warranted but have not yet been conducted. This study used computer simulations to test the expected outcome of implementing a network-mediated intervention to increase young children's physical activity. We hypothesized that intervening on opinions leaders (the most central, connected, or popular children) within the network, would produce a greater effect than intervening on other children within the network.

Methods: We studied a real-world friendship network of 81 children (average age 7.96 years) who lived in low SES neighborhoods, attended public schools and one of two structured afterschool programs in the United States. The sample was ethnically diverse and 44% were overweight or obese. We used social network analysis and agent-based modeling simulations to test whether implementing a network-mediated intervention would increase children's physical activity (as measured by accelerometry). Three intervention strategies were tested.

Results: The intervention scenario targeting opinion leaders was most effective in increasing the average level of physical activity across the entire network. However, the intervention scenario targeting the most sedentary children was best at increasing the physical activity levels of these children.

Conclusion: Which network-mediated intervention to implement depends on whether the goal is to shift the entire distribution of physical activity, or to impact those most adversely affected by low physical activity. Researchers may design more effective interventions for increasing children's physical activity by taking advantage of naturally occurring peer influences within social networks. In addition, agent-based modeling can be used to evaluate network-mediated interventions prior to implementation in the field.

S5.5.4

Social network enabled interventions for physical activity behavior change: A systematic review

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To date no review has investigated the effects of social network enabled interventions for physical activity behaviour change. Such interventions, if proven effective, have the potential for large reach, scalability and sustainability at minimal cost. However, there are several unanswered questions in regards to intervention development, implementation and evaluation that require further consideration and investigation. A systematic review of the current evidence base is an essential first step towards answering some of these questions. The aim of this study was to undertake a systematic review to investigate the effects of social network enabled interventions for physical activity behaviour change; to extract the key elements of the Behavior Change Techniques and Social Network Functions (i.e. core features of social networks) from the social network enabled interventions, and to determine what theoretical mechanisms have been used to guide intervention development.

Methods: Eight databases were searched (Medline, Embase, Cochrane Central Register of Controlled Trials, Web of Knowledge, Scopus, Psycinfo, IBSS and Sociological Abstracts) independently by two reviewers using search terms relating to 'physical activity', 'social network' and 'intervention'. Eligibility criteria included: a social network enabled intervention (i.e. purposively utilized social networks to generate and/or accelerate behavior change) for physical activity behavior change; primary outcome measure of physical activity; collected sociometric data; employed a control/comparator group. Key characteristics, outcomes, Behavior Change Techniques and Social Network Functions of the studies were extracted and tabulated.

Results: Of the 4806 publications identified, 12 were included. In summary, we found that there was a paucity of robust evidence to support the effectiveness of social network enabled interventions to promote physical activity behavior change. Based on the review we identified gaps in the literature, highlighted recommendations for future research in terms of study design, comparable measures of physical activity and social networks, and highlighted challenges and future directions.

Conclusions: This review highlights the dearth of research investigating the effectiveness of social network enabled interventions for physical activity behavior change. The findings provide a platform for guiding the design, implementation and evaluation of future research investigating social network enabled interventions and physical activity research.

S6.5. SYMPOSIUM:

Taking the next step: Translating evidence-based interventions into real world settings

Chair: Dianne S Ward, University of North Carolina, Chapel Hill, USA

S6.5.1

Translating an early childhood obesity prevention program for local community delivery: the Melbourne InFANT Program

Kylie Hesketh, Karen Campbell
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SIG: Yes, Early care and education

Awards:

Purpose: The Melbourne Infant Feeding, Activity and Nutrition Trial (InFANT) Program is an early obesity prevention program delivered to mothers of infants. It aims to get healthy eating, active play and limiting screen time 'right from the start'. Efficacy was assessed by a cluster-randomised controlled trial, following which the Victorian Department of Health (Australia) included the Melbourne InFANT Program in their evidence based Healthy Living Programs for local selection by Healthy Together Communities (part of Healthy Together Victoria, an initiative jointly funded by the State Government of Victoria and the Australian Government through the National Partnership Agreement on Preventive Health). This paper describes translation of the Melbourne InFANT Program to enable delivery within local community settings and how it was received by community providers.

Method: To enable delivery by community providers, researchers needed to modify program resources and delivery mode to allow greater flexibility and diversity of delivery. A program website was developed as a repository of program resources for participants, and a secure site for facilitators to access resources and interact with other facilitators. Resources were modified for online access, for example, the purpose-designed DVD used in the research study was converted into short video clips accessed on the program website.

Results: Facilitator training commenced in September 2013. To date six Healthy Together Communities have taken up the Melbourne InFANT Program; with another four indicating interest in future training. Additional communities have shown interest in running the program if offered beyond Healthy Together Communities. The varying ways communities have operationalised implementation of the program provides insights into the need for flexibility in programs moving from research into practice.

Conclusion: Interest in the Melbourne InFANT Program has been strong. There have been challenges involved in modifying the program to allow for the diverse needs of local communities but the early buy-in from maternal and child health nurses suggests this has been successful. Efficacy of the program within the local community setting is yet to be formally evaluated.

S6.5.2

Shape NC: Implementing evidence-based programs through an existing child care network

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³University of North Carolina, Chapel Hill, USA

SIG: Yes, Early care and education

Awards:

Purpose: To evaluate an initiative implemented through a statewide child care network that integrates three evidence-based programs to affect change in policies, practices, and environments for active play and healthy eating at child care centers.

Methods: The North Carolina Partnership for Children, with support from the Blue Cross and Blue Shield of North Carolina Foundation, created Shape NC - an initiative that integrates three evidence-based programs (NAPSACC, Preventing Obesity by Design, and Be Active Kids) to foster healthy weight behaviors in children enrolled in child care centers. Experts from each of these programs provided training and technical assistance through a train-the-trainer model. Using a competitive application process, 19 child care partnerships were selected for participation, each working with a designated child care center in their community. To evaluate impact, center directors completed an 86-item assessment of center practices every 6 months for 24 months using an instrument based largely on the NAP SACC self-assessment, but with added items to capture the initiative's expanded goals. Items were scored 1-4, where 4=»Best Practice». Children's height and weight were measured at multiple time points, and BMI calculated. Process evaluation captured implementation, technical assistance, and community outreach.

Results: Child care centers nearly doubled best practices from 40% to 74% over the 24-month period. Centers made greatest improvements in the areas of Healthy Foods (37% to 71%) and Outdoor Play (27% to 69%). Though not statistically significant, the number of children at a healthy weight (<85th percentile) increased slightly over the course of one school year. In addition to work with the centers, each partnership created a community task force and community action plan to address obesity.

Conclusions: Centers, with the support of their local child care partnerships, were motivated and made numerous changes in policies, practices, and environments. As demonstrated in these 19 communities, the Shape NC approach offers a strong framework for implementation and dissemination of evidence-based programs that support healthy eating and active play. The next phase of Shape NC will be essential in learning how to bring this model to scale for efficient translation into other communities.

S6.5.3

Creating Healthier Environments for Nutrition and Physical Activity in Early Care and Education: The National Early Care and Education Learning Collaborative Project

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SIG: Yes, Early care and education

Awards: No

Purpose: The National Early Care and Education Learning Collaboratives Project (ECELC) is a multi-state initiative developed by the Nemours Foundation and funded by the U.S. Centers for Disease Control and Prevention. The ECELC is aimed at addressing dietary and physical activity policies and practices among early care and education programs («programs»). Specifically, ECELC is an intervention involving five in-person Learning Sessions, Technical Assistance, and Action Planning. To date, ECELC is one of the largest multi-component obesity prevention programs to be implemented with children, aged birth to five, in the US.

Methods: Programs were public and private, serving about 100 infants, toddlers, and preschoolers per program. Programs, which were located throughout 6 states: Arizona, Florida, Indiana, Kansas, Missouri, and New Jersey (N=572 programs) and participated in at least one of the five, day-long (in-person) Learning Sessions, with 25-30 other programs. These Learning Sessions were focused on changing nutrition (breastfeeding, infant feeding, and child nutrition) and physical activity environments, policies, and practices. Between Learning Sessions, programs received Technical Assistance to develop an Action Plan and begin implementing best practices. The Gretchen Swanson Center for Nutrition (evaluation partner) used a pre/post test design to examine self-reported change to programs on the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC). Random intercept repeated measures mixed models, evaluating within program change, were used to examine change over time.

Results: Across NAP SACC categories, the percent of items in which programs were meeting best practices increased from 46.1% at baseline (during Action Period 1) to 59.2% at follow-up (Action Period 4) for Breastfeeding & Infant Feeding, from 58.6 to 69.2% for Child Nutrition, from 43.9% to 60.3% for Infant & Child Physical Activity, and from 50.4% to 60.7% at follow-up for Screen Time. These changes were all statistically significant (P=0.000).

Conclusion: The ECELC enabled a multi-state group of programs to begin to improve obesity-related policies and practices and establish Action Plans to continue and sustain this improvement. This initiative shows promise as an early, preventive strategy to address childhood obesity by creating healthier environments related to nutrition and physical activity in ECE programs.

S7.5. SYMPOSIUM:

Routines and Disruptions: How Changing Daily Life Shapes Child and Family Eating and Feeding

Chair: Carol M Devine, Cornell University, Ithaca, NY, USA

S7.5.1

“Doing our best to keep a routine:” how low-wage working mothers manage feeding their pre-school children in the face of the unpredictability of everyday life.

Tara Agrawal Pedulla, Tracy Farrell, Elaine Wethington, Carol Devine
Cornell University, Ithaca, NY, USA

SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: The purpose of this qualitative study was to understand how low income employed mothers of preschool children experienced the relationship of daily hassles and life events to their child feeding strategies.

Methods: Twenty-two mothers participated in two semi-structured, in-depth interviews over an eight-month period. Participating mothers had 3-4 year old children who were newly enrolled in the U.S. Head Start program in a rural county in New York State. All participating mothers were employed or in school 20 or more hours each week and were purposively recruited to vary in family (single or partnered) and household structure (living alone or with other adults). Data analysis, based on the constant comparative method of qualitative analysis, used open coding and identification of emergent themes from transcripts of audio-recorded interviews and field notes. Findings: Three types of family eating routines emerged ranging from “unpredictable” to “do our best” to “everybody sits down no matter what.” Participating mothers described the ways in which predictable and unpredictable challenges and changes in their work, school, childcare, family, and household situations disrupted their family eating routines, and required continuous strategy adjustment.

Conclusions: The lack of schedule control and major life events experienced within a relatively short period of time that were described by many of these mothers have implications for both assessing preschool child nutrition in low-income families and for designing interventions. Interventions need to be able to adapt to irregularity in family routines.

Funding: U.S. Department of Agriculture

S7.5.2

Changing families, changing food? Children’s diets in working families over time.

Julia Brannen, Rebecca O’Connell
University of London, London, England, UK

SIG: Yes, Socioeconomic inequalities

Awards:

With the rapid growth in the employment of mothers with young children in the UK, dual earning households have become typical. Whilst some survey research finds maternal employment and children’s dietary intakes are associated, little is known about how UK families negotiate everyday food practices in the context of paid employment or how children’s food and eating change over time.

A multi-method longitudinal study of employed families in England sought to address these issues. The National Diet and Nutrition Survey was employed for secondary analysis and as a sampling frame for the qualitative study. Forty-seven households including working parents and their children (aged 2-10 years) were recruited at Wave 1. Thirty-six of these were successfully followed up at Wave 2, with a two-year gap between visits. At both Waves, semi-structured interviews were conducted with parents (usually mothers). With children a combination of interviews and other activities (including drawing and photography) were undertaken. The sample included dual parent and lone parent families. Households were purposively sampled to include children with healthier and less healthy diets and a spread of higher and lower income families.

Drawing mainly on the qualitative research, and adopting a case approach, the paper analyses the processes that shape the diets of children in working families over time. Drawing on theories of social practice and the life course, the analysis relates changes in children’s food and eating over time to a variety of transitions and changes including: changes in children’s lives, changes in parents’ jobs and working hours, family income and rising food prices. Continuities in children’s diets over time are also examined. In some cases children’s diets changed in the context of their own life course transitions whilst in others changes were related to parents’ life course events. However, as the cases described suggest, life course changes and events were by no means necessary conditions for dietary change whilst in some cases children’s diets remained much the same despite a number of transitions in their own and their parents’ lives.

Funding: Economic and Social Research Council & Food Standards Agency

S7.5.3

Coping with budget restraint in a Scandinavian welfare state: How shopping, cooking, storing and eating practices change across different socioeconomic segments.

Annetette Nielsen, Lotte Holm, Thomas Bøker Lund
University of Copenhagen, Copenhagen, Denmark

SIG: Yes, Socioeconomic inequalities

Awards:

The purpose of this study was to investigate how different types of households react to experiences of food budget restraint in Denmark. The study applied a mixed method design, based on survey data and on qualitative interviews. The qualitative data source consisted of interviews with 30 individuals from Danish households with different socio-economic characteristics, who had carried through changes in their everyday food handling practices due to economic restraint. The quantitative data consists of a survey among 1650 members of a household consumer panel provided by the market research institute GfK ConsumerTracking Scandinavia. Using both data sources the study explored how shopping, storing, cooking and eating practices changed as a consequence of experienced restraints on the food budget. The quantitative results revealed how differences in terms of application of various types of strategies are related to different levels of food budget restrictions. Strategies applied to storing and cooking food in more efficient manners were widely practiced across all groups. Strategies which affected eating experiences, such as compromising the tastiness of food and giving up social ties involved in eating, first seemed to appear when food budget restriction increased. The qualitative study revealed important factors that link strategies to either positive or negative experiences. Interviewees who made a positive experiences out of cooking with more filling ingredients, reducing eating out, and using left overs, expressed some kind of extra resources in comparison to the interviewees with negative experiences in the shape of e.g. more secure life circumstances, cooking skills, and a supporting social network. The qualitative study also indicated that certain similar coping strategies such as eating seasonal fruits and vegetables, storing and using leftovers, and cooking from filling ingredients could result in either a higher or a lower intake of fruits and vegetables in adults and children.

The study concludes that food budget restraint and the consequences of it are relevant to discuss even in a Scandinavian welfare state context and that certain 'tipping points' ought to be observed between the possibility for positive or negative consequences of food budget cuts in Danish households.

Funding: Danish Council for Strategic Research

S8.5. SYMPOSIUM:

Transport behavior in adolescents and young adults: findings from Belgium, Spain and Nigeria

Chair: Dorien Simons, Ghent University, Ghent, Belgium

S8.5.1

Choice of transport mode in emerging adulthood according to gender, SES and living environment: differences between older adolescents, higher education students and working young adults

Dorien Simons^{1,2}, Ilse De Bourdeaudhuij¹, Peter Clarys², Bas de Geus², Corneel Vandelandotte³, Jelle Van Cauwenberg^{1,2}, Benedicte Deforche¹

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To examine potential differences in walking, cycling, car use and public transport use between three groups of emerging adults (older adolescents (17-18 yrs), college/university students (18-25 yrs) and working young adults (18-25 yrs)), and to investigate differences in transport modes within each of the three groups according to gender, SES and living environment.

Methods: A cross-sectional design was used to collect self-reported data via an online survey that assessed socio-demographic variables, commuting (to work or school) and transport to destinations other than work or school. 1307 emerging adults completed the questionnaire. Zero-inflated negative binomial regression models were used.

Results: To all destinations, older adolescents were most likely to cycle, college/university students were most likely to walk and use public transport and working young adults were most likely to drive by car. In all three groups, men were more likely to cycle than women and women were more likely to commute by car to work/school than men. Female older adolescents were also more likely to drive by car to other destinations. In all three groups, urban emerging adults were more likely to walk and less likely to drive by car than those living in rural areas. Urban college/university students were more likely to cycle to other destinations and urban working young adults were more likely to cycle to work. Urban older adolescents were less likely to use public transport to school, although urban college/university students and working young adults were more likely to use public transport than their rural counterparts. In all three groups, high SES emerging adults were more likely to travel by car to other destinations than those with low SES.

Conclusions: Future active transport interventions should focus on female emerging adults and on maintaining the habit of cycling after obtaining a driver's license. More research on the transport behavior of working young adults is needed as this often neglected target group was least likely to use active and public transport and most likely to travel by car. Encouraging the combined use of active and public transport might help to decrease car use when travelling longer distances.

S8.5.2

Changes in active commuting and modes of transport during the transition out of high school

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: This study examined changes in active transport during the transition out of high school and psychosocial and environmental correlates of these changes. Another purpose of this study was to describe the changes in the modes of transport to high school and university or workplace (i.e., public transport, walking, cycling and private transport) during the study period.

Methods: A one-year prospective study was designed. The baseline sample was composed of 244 last-year high school students from the city of Valencia, Spain. Follow-up rate was 46%. Physical activity was measured by the Global Physical Activity Questionnaire in two waves.

Results: Active commuting (AC) domain decreased by 36% only in males. At time 1, access to car/motorbike, planning/psychosocial barriers, street connectivity and parental education were significantly associated with AC ($P < 0.05$). Prospectively, the increase in distance to school/workplace was associated with AC decrease among males ($P < 0.001$).

Walking to school/university decreased dramatically during the study period in both males and females ($P < 0.001$). In contrast, in both groups, the use of public transport (i.e., bus and train) increased around 20% from T1 to T2 ($P < 0.05$).

Conclusions: The present findings are consistent with the idea that the transition to adulthood is related to new demands at the university or workplace affecting modes of transportation and physical activity behavior. Several psychosocial and environmental correlates of physical activity were identified, and these are promising targets for interventions.

S8.5.3

Transport mode choice to various destinations in older adolescents: socio-demographic, psychosocial and physical environmental correlates

Hannah Verhoeven¹, Dorien Simons², Jelle Van Cauwenberg², Ilse De Bourdeaudhuij², Corneel Vandelanotte³, Peter Clarys¹, Delfien Van Dyck², Benedicte Deforche²

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: As there is a lack of insight in transport mode choices for short distance travel to various destinations in older adolescents (17-18 years), the purpose of this study was to investigate which socio-demographic, psychosocial and physical environmental factors are associated with walking, cycling, passive and public transport over short distances, not only to school but also to other destinations.

Methods: In this cross-sectional study, a self-reported online questionnaire assessing socio-demographic variables, transport to school and to other destinations, psychosocial variables and physical environmental perceptions was completed by 562 secondary school students in Flanders (Belgium). To investigate the associations between dependent and independent variables, zero-inflated negative binomial (ZINB) regression models were used.

Results: Older adolescents living in an urban or denser area, those owning a public transport pass and those with a higher habit towards active transport were more likely to walk for transport. Furthermore, not owning a public transport pass, living in less dense areas, living closer to school, and having a higher habit, higher self-efficacy and higher social norm regarding active transport were related to higher odds of cycling for transport. Besides, females, adolescents of higher SES, those with more social models, more social support, more perceived benefits and less perceived barriers regarding passive transport, those perceiving less walking and cycling facilities, and those perceiving their neighbourhood as more aesthetically pleasing were more likely to make use of passive transport. Finally, being older, owning a public transport pass, living in a rural area, being of lower SES, having a higher social norm and more social support regarding public transport, perceiving lower land use mix access, and living at greater distance from school was related to higher odds of public transport.

Conclusions: It is important to incorporate various psychosocial variables in future interventions to promote active transport as well as physical environmental variables, although the latter seemed less important. Since older adolescents are able to drive a car in the near future and habit seems to be a significant predictor of walking and cycling in this age group, active transport should be promoted from an early age.

S9.5. SYMPOSIUM:

Physical activity and sedentary behavior among older adults: the role of the perceived and objective physical environment.

Chair: Veerle Van Holle, Ghent University, Ghent, Belgium

S9.5.1

Mediating effects of the perceived physical environment on the association between physical function and physical activity among Belgian older adults

Veerle Van Holle, Delfien Van Dyck, Benedicte Deforche, Jelle Van Cauwenberg, Nico Van de Weghe, Ilse De Bourdeaudhuij
Ghent University, Ghent, Belgium

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: According to socio-ecological models, physical function may be directly, but also indirectly related to older adults' physical activity (PA). Since older adults spend a substantial part of the day in their residential neighborhood, the perceived neighborhood physical environment may partly explain associations between physical function and older adults' PA. The present study investigated how physical function is associated with walking for transportation, walking for recreation and moderate-to-vigorous PA (MVPA), and examined the possible mediating roles of the perceived physical environment on these associations among Belgian older adults (≥ 65 y).

Methods: Data from 438 older adults, living across 20 neighborhoods in Ghent, Belgium, were included for analysis. Self-reported physical function was assessed using SF-36. Measures of the perceived environment (NEWS) included land use mix access, land use mix diversity, street connectivity, access to recreational facilities, aesthetics, crime-related safety, traffic levels and walking infrastructure. Walking for transportation and recreation were measured using IPAQ, objective levels of MVPA were assessed through Actigraph accelerometers. Single mediation analyses were conducted using regression analyses for each environmental factor and each PA outcome. Furthermore, multiple mediation analyses were applied. Mediating effects were examined using the MacKinnon product-of-coefficients test.

Results: Better physical function was positively associated with the three PA outcome measures. Land use mix diversity (4.7%) and walking infrastructure (5.2%) mediated the association between physical function and MVPA (multiple mediation 6.9%). Land use mix diversity (25.5%), access to recreational facilities (22.8%), crime-related safety (-38.0%) and walking infrastructure (8.9%) mediated the association between physical function and transportation walking (multiple mediation 19.4%). No mediating effects were observed for the association between function and recreational walking.

Conclusion: Belgian older adults' perceptions of the physical environment differ according to level of physical function, and partially explained associations between function, objective MVPA and transportation walking. Interventions aimed at increasing MVPA and transport-related walking could focus on increasing presence of local shops and services, combined with providing adequate walking infrastructure, especially for at-risk groups with lower physical function. Longitudinal research is needed to confirm these findings and to investigate other possible mediators.

S9.5.2

Are objectively-measured environmental correlates of walking also predictive of sitting in older adults? A cross-sectional study.

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: While sitting time has been associated with non-communicable diseases, little is known about the effect of the environment on sitting time in older adults. This study examined associations of objectively-measured neighbourhood environmental attributes deemed to facilitate walking with sitting time in Hong Kong older adults. Neighbourhood attributes encouraging walking may help older adults replace some of the time spent sitting at home with light-to-moderate intensity activities such as strolling around the neighbourhood or walking to/from neighbourhood destinations. Thus, we hypothesized environmental correlates of walking would show associations with sitting time opposite to those seen for walking, and neighbourhood safety and infrastructure characteristics would moderate relationships between sitting time and destinations.

Methods: Ethnic Chinese Hong Kong residents aged 65+ (n= 484) were recruited from membership lists of four Hong Kong Elderly Health Centres representing catchment areas of low- and high-transport-related walkability stratified by socio-economic status (SES). Attributes of participants' neighbourhood environments where assessed by environmental audits and sitting time ascertained using the International Physical Activity Questionnaire-Long Form (Chinese version). Generalized linear models accounting for neighbourhood-level clustering effects were used to examine objectively-measured associations of neighbourhood environmental characteristics with sitting time.

Results: Daily sitting minutes were 283 (SD=128). Prevalence of signs of crime/disorder, streetlights, and public facilities (public toilets and benches) were independently negatively related, and sloping streets positively related, to sitting. Presence of at least one place of worship in the neighbourhood was predictive of more sitting than absence of places of worship. Prevalence of public transit points was negatively related to sitting. Associations between sitting and entertainment destination diversity and prevalence of food/grocery stores were moderated by signs of crime/disorder and path obstructions, respectively.

Conclusions: The findings of this study suggest that diversity of destinations and relatively low cost, minimal impact modifications to the urban form, such as street lighting, public toilets, benches and public transit points, could potentially reduce sitting time and associated negative health outcomes in Hong Kong older adults.

S9.5.3

Perceived park proximity and quality, neighborhood physical and social environment and recreational physical activity among mid-older aged adults

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To examine relationships of perceived park proximity, park quality, neighborhood physical and social environmental factors with recreational physical activity among mid-older aged adults. Additionally, we examined moderation effects of park quality and neighborhood physical and social environmental factors on the relationship between park proximity and recreational physical activity.

Methods: Self-reported cross-sectional data on park proximity, quality, neighborhood physical and social environmental factors, recreational walking and other moderate- to vigorous-intensity physical activity (MVPA) were collected among 2700 Australian adults (57-69 years).

Results: Park proximity was positively related to engagement in recreational walking if participants reported that others were physically active in their neighborhood. Park quality and social trust and cohesion were related to more recreational walking among those who walked for recreation. No relationships for neighborhood physical environmental factors were observed, nor did any environmental factor relate to other recreational MVPA.

Conclusions: Park proximity, quality and social environmental factors might be important to promote recreational walking among mid-older aged adults. More research is needed to unravel the complex relationships between parks, neighborhood physical and social environmental characteristics and recreational PA.

S1.6. SYMPOSIUM: Determinants of Diet and Physical Activity (DEDIPAC)

Chair: Johannes Brug, EMGO+ Institute for Health and Care Research, Amsterdam, The Netherlands

S1.6.1

Assessment and harmonisation of methods for future pan-European research, monitoring and evaluation of interventions and policies: Systematic literature review of methods to assess intake of sugar-sweetened beverages and inventory of European surveillance systems

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective: To develop effective pan-European public health nutrition and physical activity strategies, Europe needs to overcome the current diversity in methods for assessing dietary, physical activity and sedentary behaviours and their determinants. This abstract illustrates how DEDIPAC Thematic Area 1 (TA1) contributes to the required harmonization by (i) a systematic review of methods to assess intake of sugar-sweetened beverages (SSBs), which have been identified as a major public health challenge, and (ii) an inventory of surveillance systems as part of the development of a roadmap towards a harmonised pan-European surveillance system that fills current gaps of knowledge.

Methods: Methods to assess the intake of SSBs were identified using PubMed, EMBASE, Web of Science, and hand-searching reference lists. English language articles, involving two or more European countries, assessing intake of SSBs in healthy adults or children were included. Second, data on existing surveillance systems and their supporting research infrastructures were obtained from national and international experts who completed a dedicated questionnaire on national, regional and European surveillance systems.

Results: The food frequency questionnaire (FFQ) was the most commonly used method (N=22) to assess intake of SSBs in 23 pan-European studies identified. Definitions of SSBs, frequency-categories, and portion size estimation differed between FFQs.

Five international, one regional and 34 national surveillance systems were initially identified through a preliminary analysis of the inventory. Of these 40 (inter)national and diverse surveillance systems, 35 incorporated physical activity, 30 dietary intake (i.e. food intake) and 20 dietary behaviours (e.g. breakfast consumption, number of meals per day). Sedentary behaviours were assessed in 18 surveys. Young populations, i.e. infants and children, were less often addressed in national/regional surveys.

Conclusions: Standardizing the assessment of specific behaviours (as intake of SSBs) including their determinants is a first and necessary step to advance research and monitoring. The majority of surveillance systems exist at the national level, however, only those linked to larger European initiatives address standardisation of methods, designs and procedures. The preliminary results from the inventory will enable reporting on the main gaps and needs for future pan-European surveillance.

S1.6.2

Development of a trans-disciplinary framework for determinants of dietary behaviour, physical activity and sedentary behaviour to plan and evaluate pan-European research

Sebastien, FM Chastin¹, Greet Cardon², Britta Renner³, Laura Capranica⁴, Michelle Holdsworth⁵, Mario Mazzochi⁶, Donal O'Gorman⁷, Nanna Lien⁸

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SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective:

One of the main objectives of DEDIPAC Thematic Area 2 is to provide the pan-European research community with trans-disciplinary frameworks on determinants of diet, physical activity and sedentary behaviour to plan and evaluate research. Current models are often limited to one disciplines and one level of influence. The new frameworks aim to organise known and potential biological, psychological, sociological, economic, ecological and socio-economic factors and their interactions from a multilevel perspective.

Methods:

The frameworks need to fulfil a number of criteria. They must a) be directly useful and dynamic, b) identify an exhaustive list of known and potential factors and organise them into systems and subsystems at different scales and map their interaction, c) identify factors that are a priority for research because of their actual or theoretical potential effect size and potential or proven modifiability, d) be consensual and capture multidisciplinary thinking, e) be agnostic, f) be based on a systematic and structured process. To achieve this, a two stage nested concept mapping protocol has been developed. Concept mapping is a structured and systematic method that enables to capture and organise collective thinking. The first stage is conducted within DEDIPAC and results will be in frameworks stratified by age. The second stage involves the wider research community to integrate this into a life course system-based framework.

Results:

Obtaining consensus across multiple disciplines and spread over 12 nations is a complex task which is still in development. During the preparation phase it was agreed that going straight into system-based thinking was too difficult. Instead a phased approach was developed. The early stages required developing common terminology, and intermediary models based on ecological models integrating a life course approach and multiple outcomes (sub-behaviour) to allow for a shared understanding of system-based thinking to mature.

Conclusion:

The first concept mapping phase is now achieved and the work is entering the second phase in which the frameworks developed by DEDIPAC will be presented to a wider research community for validation. The final aim is to enable trans-disciplinary research based on a shared system-thinking model and to identify priorities for research and interventions.

S1.6.3

Evaluation and benchmarking of public health and policy interventions aimed at improving dietary, physical activity and sedentary behaviours

Anne Ludbrook¹, Catherine Woods², Ilse De Bourdeaudhuij³, Marie Murphy⁴

¹University of Aberdeen, Aberdeen, UK, ²Dublin City University, Dublin, Ireland, ³Ghent University, Ghent, Belgium, ⁴University of Ulster, Ulster, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective:

The overall purpose is to describe the development of a concept toolbox for monitoring, evaluating and implementing policy interventions related to dietary, physical activity and sedentary behaviour in Europe. In order to develop this concept toolbox, literature searches were conducted to identify policy evaluations in the areas of diet, physical activity and sedentary behaviours.

Methods:

A rapid review of policy monitoring and evaluation related to diet, physical activity and sedentary behaviour was conducted using a systematic reproducible approach. The rapid review was limited to existing systematic reviews. A data extraction form was developed to guide the process of assessing study methods and evidence gap maps were developed to identify the coverage of policy areas and evaluation methods.

Results:

For diet 18 primary studies were identified for inclusion from one systematic review, for physical activity 13 studies were identified from 5 systematic reviews, for sedentary behaviour, no reviews meeting the inclusion criteria were identified.

Following the review, a draft toolbox was created including (1) methods to analyse policies, (2) behaviour change methods characterising the content of the policy, (3) measures for the behaviours, determinants and health effects, (4) economic analyses and (5) methods and measures for process evaluation.

A paper-based version of the content was developed with a view to having a web-based version developed for the DEDIPAC site. The policy methods section is presented as a pathway, where researchers, practitioners or policy members who are planning an evaluation will be guided through definitions and descriptions of methods that will be appropriate to their study. This will include recommendations for study design as well as outcome and/or process evaluation

Conclusions:

The 'best' policy evaluation method and study design is dependent upon a range of factors, including the nature of the policy, the timing of the evaluation, the available data and comparison groups. The toolbox will be presented together with recommendations for strengthening policy evaluation practice.

S2.6. SYMPOSIUM:

Assessing dietary intake: Closing gaps between what we know and what we do

Chair: Sharon I Kirkpatrick, University of Waterloo, Waterloo, Ontario, Canada

S2.6.1

Identifying robust and feasible strategies for dietary assessment: Lessons from the Canadian Partnership for Tomorrow Project

Paula Robson
Alberta Health Services, Edmonton, Alberta, Canada

SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Diet likely plays a major role in chronic disease etiology. While advances have been made over the past several decades, much remains to be learned about how overall dietary patterns or individual nutrients or food components influence disease risk. Further complexity stems from observations that gene-environment interactions probably need to be explored in order to elucidate relations between diet and risk of chronic disease. Limitations in our current evidence base pose a barrier for identifying effective strategies to improve the diets and health of populations. This talk will focus on the challenges posed when selecting and implementing appropriate dietary assessment methods in very large observational cohorts/biobanks that are designed to explore the etiology of chronic disease in adult populations, with potential lessons for other types of research.

Methods: The discussion will draw upon experiences identifying dietary assessment methodologies for the Canadian Partnership for Tomorrow Project, a cohort of 300,000 adults aged >35y spread across eight provinces in Canada.

Results: Approaches to identifying the best possible options for collecting comprehensive and robust dietary data from large samples using self-report instruments will be shared. Specific examples include pilot-testing of a web-based food frequency questionnaire (Canadian Diet History Questionnaire) for feasibility, repeatability and acceptability and pilot-testing of multiple administrations of a web-based 24-hour recall (Automated Self-administered 24-hour Recall-Canada, or ASA24-Canada) in a community-based sample. Next steps with respect to dietary assessment in the Canadian Partnership for Tomorrow Project will be discussed, with potential learnings for other initiatives identified.

Discussion: Very large observational cohorts/biobanks have been identified as an important element in building our knowledge of diet and health relationships and informing interventions to improve diet and health. To support such efforts, we must consider the collection of high-quality genetic material *and* high-quality dietary data. While substantial funding has supported advances in the genomic arena, much less attention and support has been given to ensuring that dietary data are of sufficient quality. Experiences of the Canadian Partnership for Tomorrow project can help to advance dietary assessment in initiatives in other settings.

S2.6.2

Towards a web-based dietary research infrastructure to support provision and pooled analyses of standardised dietary data in Europe: Report from the GloboDiet-Europe initiative

Nadia Slimani
International Agency for Research on Cancer, Lyon, France

SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: The development of standardised dietary tools to provide comparable food consumption data is a prerequisite for more joint research, surveillance and prevention activities across Europe. However, the e-research infrastructures (e-RI) needed to ensure a high level of standardization in data maintenance, quality controls, sharing and analyses remain poorly addressed. Building on longstanding experiences and partnerships, a standardized computerized 24-hour dietary recall program (GloboDiet, formerly EPIC-Soft) has been developed, validated and implemented in international epidemiological studies and monitoring surveys. In addition, the concept and first prototypes of e-RI to support this program have been developed. We will report on needs, gaps and challenges addressed to develop this innovative pan-European e-RI under the "GloboDiet-Europe" consortium framework.

Methods: The e-RI ("e-Standardised Methodologies Platform" - e-SMP) was developed using a stepwise approach with the following **Objectives:** a) to develop the e-SMP conceptual design, addressing identified needs, gaps and challenges; b) to test and evaluate concepts developed by end-users; c) to develop the applications and web-platform; d) to evaluate the e-RI and its applications by end-users in real study conditions; and e) to roadmap strengths and barriers for implementation and long-term maintenance.

Results: The general concept and first releases of e-SMP were developed and interfaced with other existing RIs (e.g., EuroFIR) and evaluated, considering five main modules related to dietary intake data: 1) maintenance and settings, 2) interview collection, 3) interview management, 4) administration, and 5) data access/sharing, in addition to communication facilities.

Conclusions: e-SMP will support international studies using the IARC-WHO GloboDiet methodologies in terms of standardized implementation, data collection, quality controls, management and (pooled) analyses of collected data. It will provide cost-effective capacity for countries (including e-training facilities) with limited local technical resources and dietary assessment skills, while ensuring independence and flexibility.

S2.6.3

Approaches to advancing the assessment of dietary intakes among children and young peopleAshley Adamson*University of Newcastle, Newcastle upon Tyne, UK***SIG:** Yes, Cancer Prevention and Management**Awards:**

Purpose: The challenges of assessing dietary intake in any population are well recognised. Measuring dietary intake of children brings numerous additional challenges. Children may lack the cognitive skills to recall their food intake, may not have basic writing skills, or have limited knowledge of food names, types and preparation details. Parents' knowledge of foods consumed out of the home may be limited. Assessment is further complicated by the number of people likely to be involved in caring for the child. Adolescents are likely to be more aware of the foods they consume and have the cognitive and writing skills to record their own food intake but may lack interest or motivation. Research has focused on reducing the burden of recording intake on the participant while achieving robust measures.

Methods: Developments include food photographs for assessment of portion size and, in recent years, computer-based methods designed for self-completion with the aim of motivating young people to participate in studies by making dietary reporting more engaging. Two such tools developed at Newcastle University, UK will be discussed.

Results: The Young Person's Food Atlas and INTAKE24Online dietary assessment methods offer a cost-effective means of collecting detailed dietary information from large samples whilst minimising the burden placed on the volunteer. Development was an iterative process involving four cycles of user interaction, evaluation and further development. The portion sizes of foods reported in INTAKE24 are estimated using a series of food photographs developed based on portion sizes reported in the UK National Diet and Nutrition Surveys. Evaluation efforts assessed usability and accuracy of portion size reporting. Agreement between INTAKE24 and interviewer-led recalls was good, with intakes of energy and macronutrients within 1% on average.

Conclusions: It is important when assessing the validity of any method of measuring dietary intake in children and young people that we accept the limitations that the subject's cognitive skills impose. Collecting an absolutely accurate record of intake may not be possible but by tailoring dietary methods to the specific needs of the population, the accuracy of dietary reports for children and young people can be greatly improved.

S3.6. SYMPOSIUM:

Promoting healthy eating and physical activity during out-of-school time

Chair: Stephanie Anzman-Frasca, Tufts University, Boston, MA, USA

S3.6.1

Effectiveness of after-school interventions at increasing moderate-to-vigorous physical activity levels in 5-18 year olds: a systematic reviewRuth Mears^{1,2}, Russell Jago²¹*School of Social and Community Medicine, University of Bristol, Bristol, UK*, ²*School for Policy Studies, University of Bristol, Bristol, UK***SIG:** Yes, Policies and environments**Awards:**

Objective: Many children fail to meet the national recommendation of at least 60 minutes per day of moderate to vigorous physical activity (MVPA). After-school (extra-curricular) programmes provide an opportunity to engage children in physical activity, but the actual intensity of exercise achieved may vary. This systematic review examines the effectiveness of after-school interventions at increasing MVPA levels in children and adolescents.

Methods: A literature search was conducted using Medline, EMBASE and PsychINFO databases. Studies were included in this review if they met all of the following criteria: Participants aged 5-18 years old, after-school setting, intervention to promote physical activity, an outcome measure of MVPA and quasi-experimental, pilot, non-randomised or randomised study design. Conference abstracts, unpublished articles and dissertations were excluded.

Results: Results were reported in accordance with PRISMA guidelines. 1324 records were identified through database searching. After removal of duplicates, there were 703 records. 21 articles met the inclusion criteria. There was considerable variation in the effectiveness of afterschool interventions at increasing MVPA. Inconsistencies in objective measurements of physical activity made interpretation of pooled results challenging. There was a lack of randomised controlled trials and of process evaluation data. A number of studies lacked detail regarding sample size calculation. Many studies failed to report whether the intervention components were based on a psychological theory of behaviour change. Individual studies often failed to analyse differences by gender. There was a dominance of North American studies, with a lack of data from other continents. There was a shortage of information on cost, and cost-effectiveness.

Conclusion: More robust evaluations of physical activity interventions in the after-school setting are required in the form of randomised controlled trials with objective measures of physical activity and inclusion of costs analyses.

S3.6.2

Evaluation of phase 2 of an after-school cooking skills program in a disadvantaged community: the Back-to-Basics program

Tracy L. Burrowes^{1,2}, Hannah Lucas^{1,2}, Philip J. Morgan^{2,3}, Clare E. Collins^{1,2}

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SIG: Yes, Policies and environments

Awards:

Objective: Few efficacious child obesity interventions have been adapted into after-school programs. To address this, the Back to Basics (B2B) after-school cooking program was developed to incorporate the nutrition messages from the Hunter Illawarra Kids Challenge Using Parent Support (HIKCUPS) child obesity program, previously shown to improve child BMI z-scores, dietary intake and physical activity up to 24 months. The aim was to evaluate the impact of Phase two of the B2B after-school cooking club on dietary behaviours and fruit and vegetables in a disadvantaged community at risk of obesity.

Methods: B2B targets children (5-12 years) and their parents/guardians in disadvantaged low socio-economic status (SES) schools in the Hunter Region, NSW, Australia. B2B includes 5 x 90mins after-school cooking sessions, held once every two weeks during one school term. Each after-school session sequence includes: children provided with a healthy afternoon tea (e.g. fruit); children participate in cooking session; parents attend final 30 minute activity which concludes with families sharing the meal prepared by the children. Data on dietary intake and behavioural constructs from social cognitive theory (SCT) adapted for fruit and vegetables were assessed in children (aged 5-12) by interviewer administered questionnaire. Effect size was calculated using Cohen's *d* analysis and assessed as small $d < 0.50$, moderate 0.50 to < 0.80 or large ≥ 0.80 .

Results: The proportion of children ($n=51$) reporting usual consumption of one or more fruit servings/day significantly increased from 41% to 67% of children ($P=0.02$, $d=0.13$), with no change in usual vegetable intake. Although not statistically significant, the proportion consuming vegetables with dinner ≥ 5 times per week increased from 32% to 43% at follow-up, ($P=0.18$ $d=0.20$). Across SCT constructs assessed (environment, situation, behavioural capabilities, outcomes expectations and expectancies, self-control, observational learning, reinforcement, self-efficacy; emotional coping responses and reciprocal determinism) improved significantly ($P<0.01$), with moderate to large effect sizes ($d=0.33-0.78$).

Conclusions: An after-school cooking club with a parental nutrition component is acceptable to families in a low SES community, improves many SCT constructs and frequency of fruit consumption. Back to Basics is now a train-the-trainer program for other disadvantaged schools with web-based support and ongoing evaluation underway.

S3.6.3

Promoting Healthy Snacks during Out-of-school Time through Grocery Store Partnerships: the Snack it Up Pilot Study

Stephanie Anzman-Frasca^{1,2}, Sara Folta², Heather Angstrom¹, Michael Beets³, Clarissa Brown², Anna Marie Finley¹, Miriam Nelson^{4,2}, Christina Economos^{1,2}

¹*ChildObesity180, Tufts University, Boston, MA, USA,* ²*Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA, USA,* ³*Department of Exercise Science, University of South Carolina, Columbia, SC, USA,* ⁴*Tisch College of Citizenship and Public Service, Tufts University, Medford, MA, USA*

SIG: Yes, Policies and environments

Awards:

Objective: Volunteer-led out-of-school-time (OST) programs (e.g., Boy Scouts, 4-H, youth sports) reach a large, diverse population of children and are positioned to offer opportunities for healthy eating. However, cost is a barrier to providing healthy snacks, such as fruits and vegetables (FV), during OST. Offering discounts through grocery store partnerships is a promising model to address this barrier in traditional after-school programs (Beets, Tilley, et al., 2014). The aim of this pilot study was to test this model in volunteer-led OST programs.

Methods: Volunteer-led OST programs were recruited in Fall 2013/Winter 2014 and included 27 Snack It Up (SIU) intervention programs ($n=11$ in the South, SIU-SO; $n=16$ in New England, SIU-NE) and 20 comparison programs (New England). Programs had a median of 10 children enrolled. SIU-SO and SIU-NE program leaders received an unlimited 5% or \$5 flat weekly discount, respectively, on FV purchased at a participating grocery store chain from Fall 2013/Winter 2014 through May 2014 (SIU-SO)/ June 2014 (SIU-NE). Mixed evaluation methods included purchase data from grocery stores (SIU programs), digital photographs of snacks served during 3-4 program meetings (SIU and comparison programs), and baseline and follow-up interviews with leaders (SIU programs).

Results: Purchase data revealed that SIU-SO leaders saved an average of \$4.64 across the study (\$0.15 per child), while SIU-NE leaders saved \$48.75 (\$5.77 per child). Photo data showed a greater variety (3.3 vs. 1.3 items per session) and frequency (100% vs. 54.8% of sessions) of FV served in the SIU versus comparison group ($p<.0001$ for each). Interview data confirmed cost and convenience as barriers to providing healthy snacks and indicated that leaders enjoyed the SIU program. SIU-NE leaders perceived the \$5 discount as motivating, while SIU-SO leaders perceived the 5% discount as small and unlikely to motivate leaders uninterested in health.

Conclusions: Discounting healthy snacks through grocery store partnerships is a promising model for volunteer-led OST programs, as evidenced by FV purchased and served and positive leader feedback. Results suggest that the \$5 discount was more motivating and impactful than the 5% discount, highlighting the former as a particularly promising model to explore in subsequent research.

S4.6. SYMPOSIUM:

Going beyond the outcome data: process evaluations of interventions in physical activity and sedentary behaviour

Chair: Stuart JH Biddle, Victoria University, Melbourne, Australia

S4.6.1

Implementation of a physical activity consultation service within routine diabetes care: A process evaluation

Lynsay Matthews

University of the West of Scotland, Paisley, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Explore the feasibility, implementation and effectiveness of a physical activity consultation (PAC) service for adults within routine diabetes care.

Methods: A 12-month PAC intervention was delivered for adults with diabetes. Participants received three face-to-face PACs with an Exercise Health Psychologist, in addition to a variety of follow-up contacts via phone or email. Outcomes were collected at baseline, 6&12 months to measure change in physical activity, BMI, HbA1C and psychological wellbeing. A process evaluation, using semi-structured interviews, session summaries and data input sheets, was performed by an independent colleague.

Results: The PAC service is on-going. Of the initial 51 participants included in the process evaluation 51.2% were female, mean age 60.9±10.2 years, mean BMI 33.1±6.9, 83.7% had type 2 diabetes, and 55.8% had multiple co-morbidities. A significant increase was observed from baseline at 6 & 12-months in the number of participants achieving the physical activity recommendations (21.3% vs 66.7% vs 60.5%; $P<0.02$). A significant increase was observed in mean change for positive affect (PANAS) from baseline to 6-months (3.6 ± 1.4 , $P=0.05$) and 12-months (4.7 ± 1.3 , $P=0.003$), in addition to a mean decrease in perceived levels of depression (HADS) from baseline to 6-months (-2.0 ± 0.7 , $P=0.043$) and 12-months (-2.2 ± 0.7 , $P=0.013$). A significant decrease in BMI was observed from baseline to 6-months (-0.7kg/m^2 SD 1.7, $P=0.016$) and in self-reported weight loss ($-2.6\pm0.8\text{kg}$, $P=0.014$). No change was observed in HbA1c. Process evaluation identified several amendments which optimised support for participants, including: a 45-min versus 30-min PAC duration; inclusion of a phone call 1-week after the initial PAC; and an additional face-to-face contact for participants with complex support needs. The service was viewed positively with high adoption by health professionals. Reasons given for successful implementation included a protocol integrated with diabetes care, minimal time requirements from health professionals, and skilled delivery of the intervention by an Exercise Health Psychologist.

Conclusions: PAC within routine diabetes care can be a feasible and effective method of supporting people with diabetes to increase their levels of physical activity and improve psychological wellbeing. Future interventions should focus on developing interventions which integrate with current diabetes care.

S4.6.2

The impact of program implementation on objectively measured physical activity and sedentary time: the IDEFICS Study in Belgium

Vera Verbestel¹, Ilse De Bourdeaudhuij¹, Wolfgang Ahrens², Iris Pigeot², Stefaan De Henauw¹

¹Ghent University, Ghent, Belgium, ²University of Bremen, Bremen, Germany

SIG: No, this does not fit in any of the special interest groups

Awards: No

Purpose: The purpose of this study was to test the hypothesis that a higher implementation score of the IDEFICS intervention will lead to stronger effects on objectively measured physical activity and sedentary time in 2 to 9 year old boys and girls. A second purpose was to assess the implementation threshold needed to reach effects.

Methods: The IDEFICS study used a prospective multi-centre design in 8 European countries. In each country an intervention community and a control community was selected. The IDEFICS intervention was developed using the Intervention Mapping Protocol (Verbestel et al., 2011). Process evaluation measures were based on Saunders (2005) and Linnan and Steckler (2002) and included context, reach, dose delivered, dose received, fidelity, implementation and recruitment. In the present study implementation data from 34 intervention schools (976 children) in Belgium were used to investigate the effect of one year of intervention on physical activity and sedentary behaviour assessed by accelerometry. Based on all process measures an implementation score was computed for each child and categorised into tertiles (low, moderate, high implementation). Multivariate repeated measures analyses were executed to test the time by group (tertile) effect on the accelerometer outcomes.

Results: In general the total implementation score was only moderate with a mean value of 21 on a maximum of 44. A significant multivariate time by group interaction effect was found ($F=2.58$, $p=0.037$). Univariate tests showed a significant effect for light activity ($F=5.02$, $p=0.008$) and for sedentary behaviour ($F=3.75$, $p=0.026$), but not for MVPA ($F=0.14$, $p=0.87$). For light activity a significant decrease was found over time in the low and moderate implementation group, while no changes were found for the high implementation group. For sedentary behaviour, a significant increase was found for the low and moderate implementation group, while no changes were found for the high implementation group.

Conclusions: The IDEFICS intervention succeeded in countering a decrease in light activity and an increase in sedentary time especially in those with a high implementation score. A low or moderate implementation score, which means that only half or less of the intervention components were implemented is not enough to reach effects on accelerometry.

S4.6.3

"It's a bit daft to stand": Process evaluation of the STAND intervention to reduce sitting time in at-risk younger adults

Stuart Biddle^{2,1}, [Charlotte Edwardson](#)³, Trish Gorely⁵, Emma Wilmot⁴, Tom Yates³, Myra Nimmo¹, Kamlesh Khunti³, Melanie Davies³

¹Loughborough University, Loughborough, UK, ²Victoria University, Melbourne, Australia, ³University of Leicester, Leicester, UK, ⁴Royal Derby Hospital, Derby, UK, ⁵University of Stirling, Stirling, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Substantial portions of the day are spent sitting for many adults and evidence shows that high levels of sitting have deleterious effects on health. Although interventions to reduce sitting have been conducted, often these are with young people or focused on a narrow range of behaviours, such as sitting at work. Less is known about a range of barriers to sitting less or strategies that might prove successful in helping adults sit less.

Methods: Participants taking part in a RCT ('STAND') for reducing sitting time in younger adults at risk of diabetes were interviewed 6 weeks after taking part in an educational workshop on sedentary behaviour and diabetes (n=45), and again at the conclusion of the 12 month trial (n=28). The core of the RCT comprised attendance at an educational workshop.

Results: We present data on risk awareness and the use of a self-monitoring and prompting device ('Gruve'). Participants were split between those recognising too much sitting as a risk to health, while others saw it as not being physically active enough. In addition, workshop educators also detected a lack of risk perception for those receiving largely favourable feedback on their baseline test results. A self-monitoring/prompting tool was used. This was perceived as a positive element of the study and should have helped participants in their quest to reduce their sitting time. Ways of optimising its use, including battery life, improving its reliability, and ease of accessing online feedback, are needed.

Conclusions: Research is needed on the effectiveness of such strategies and to what extent increases in physical activity affect sitting time.

S4.6.4

Evaluation of process models within RCTs involving SDT-based physical activity (and associated) well being promotion interventions: Challenges and benefits

[Joan Duda](#)

University of Birmingham, Birmingham, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

The importance of testing the hypothesised processes involved in delivering interventions and assessing their effect has been advocated. The physical activity promotion literature also points to the importance of such intervention efforts being theoretically-based. Via process evaluations, it is possible to examine whether interventions are inadequately delivered (lack fidelity) as well as whether the underlying theoretical groundings to our interventions are (or are not) supported. It is also possible to determine which maybe the "active ingredients" integral to effectiveness and if impact of the intervention varies across contexts and sub groups. This presentation will highlight findings and 'lessons learned' from process evaluations across several interventions that are primarily grounded in Deci and Ryan's Self Determination Theory (2000) and aimed to enhance levels of physical activity and optimal functioning in diverse groups (including clinical populations and adults 'at risk' of cardiovascular disease as well as trials involving children). Challenges such as frequently observed ceiling effects and the sensitivity of our available measurement tools to determine intervention impact on environmental need support will be raised. Another issue highlighted relates to the importance of determining the degree to which the content of need supportive training programmes is delivered as intended and the degree to which the training was itself was presented in a need supportive matter for attendees. Illustrations of how SDT supported process models have been tested will be provided. The presentation will also address how it is informative to test whether those process models are moderated by/are invariant across different targeted populations and settings.

S5.6 SYMPOSIUM:

Fiscal food policies for public health and climate change

Chair: Wilma E Waterlander, University of Auckland, Auckland, New Zealand

S5.6.1

Effects of health-related food taxes and subsidies on mortality from diet-related disease in New Zealand: a comparative risk assessment modelling study

Cliona Ni Mhurchu¹, Helen Eyles¹, Murat Genc², Peter Scarborough⁴, Mike Rayner⁴, Anja Mizdrak⁴, Kelechi Nnoaham⁴, Tony Blakely³

¹University of Auckland, Auckland, New Zealand, ²University of Otago, Dunedin, New Zealand, ³University of Otago, Wellington, New Zealand, ⁴University of Oxford, Oxford, UK

SIG: Yes, Policies and environments

Awards:

Objective: Our aim was to estimate for the first time the potential effects of health-related food taxes and subsidies on mortality from diet-related diseases in New Zealand.

Methods: A macrosimulation model based on household expenditure data, demand elasticities and population impact fractions for 18 diet-related diseases was used to estimate effects of five health-related food taxes and subsidy regimens. We used price elasticity values for 24 major commonly consumed food groups in New Zealand, and food expenditure data from national Household Economic Surveys. Changes in mortality from cardiovascular disease, cancer, diabetes and other diet-related diseases were estimated. No time lags from dietary change to mortality were included.

Results: A 20% subsidy on fruit and vegetables would potentially avert or postpone 555 (95% uncertainty interval 402 to 702) deaths each year in New Zealand (1.9% annual all-cause mortality). A 20% tax on major dietary sources of saturated fat would avert 1,451 (948 to 2,051) deaths (5.0%), and a 20% tax on major dietary sources of sodium would avert 1,977 (1,289 to 2,745) deaths (6.8%). Combining taxes on saturated fat and sodium with a fruit and vegetable subsidy would avert 2,352 (1,755 to 2,996) deaths (8.1% mortality annually). A tax on major dietary sources of greenhouse gas emissions would avert 1,163 (749 to 1,696) deaths annually (4.0%). Taxes modelled would increase average household food expenditure by up to NZ\$3.25/week (2.2%), and government tax revenue would range from about NZ\$25 to NZ\$37 million per year. The fruit and vegetable subsidy would decrease average weekly household food expenditure by NZ\$2.07 (1.4%) and cost approximately NZ\$23.7 million/year.

Conclusions: Health-related food taxes and subsidies would reduce mortality from diet-related disease in New Zealand. They merit consideration as part of a multifaceted strategy to tackle diet-related disease.

S5.6.2

Evidence on the Potential Effectiveness of Soda Taxes as an Instrument to Reduce Soda Consumption and Obesity

Lisa Powell, Roy Wada, Jamie Chriqui, Frank Chaloupka
University of Illinois at Chicago, Chicago, USA

SIG: Yes, Policies and environments

Awards:

Objective: The purpose of this work is to provide empirical evidence on the relationship between soda taxes and household soda purchases and additional evidence on soda prices and youth soda consumption and obesity outcomes.

Methods: To assess the relationship between taxes and purchases, information on household soda purchases was obtained from third quarter retail scanner data for 2010-2012. We collected information on population-weighted state and county-level sales tax rates for soda and non-soda food items and computed disfavored soda tax rates as the difference between the two. We assessed the direct impacts of disfavored soda tax rates and household Supplemental Nutrition Assistance Program (SNAP) eligibility on household soda purchases using two-part model. We further assessed the conditional impacts by stratifying the analyses by household SNAP eligibility, household characteristics, and disfavored soda tax rates. Next, we linked soda prices collected from 2010-2012 in the Bridging the Gap Community Observation Measures Project to individual-level student soda consumption and body weight measures from the Monitoring the Future Study from a national sample of 8th, 10th and 12th grade students in the U.S. Multivariate regression analyses assessed associations with soda prices.

Results: Disfavored soda tax rates are significantly associated with lower household soda purchases (elasticity of -0.03, $p \leq 0.01$). However, among low-income households no significant associations are found among SNAP eligible households, whereas purchases for SNAP non-eligible households are found to be tax sensitive (elasticity of -0.7, $p \leq 0.01$). Preliminary results show that soda prices are significantly associated with lower student-level soda consumption and body mass index.

Conclusions: Soda taxes can be expected to reduce household purchases and youth consumption and obesity rates. However, the potential impact of such taxes are moderated by participation in SNAP. Tax policies and nutrition assistance program policies need to be harmonized.

S5.6.3

Assessing the impact on chronic disease of a combined food tax based on greenhouse gas emissions and sugar-sweetened beverages: an economic and comparative risk assessment modelling study

Adam Briggs¹, Ariane Kehlbacher², Richard Tiffin², Peter Scarborough¹

¹University of Oxford, Oxford, UK, ²University of Reading, Reading, UK

SIG: Yes, Policies and environments

Awards:

Objective: Previous studies have indicated synergies between diets low in greenhouse gas emissions (GHGEs) and health benefits, however there are known conflicts including the relatively low contribution to GHGEs of sugar-sweetened beverages (SSBs). We use novel economic modelling methods to extend previously published work that estimated the impact on chronic disease of incorporating the societal costs of GHGEs into the price of food in the UK through taxation. We assess the potential impact on GHGEs and chronic disease of combining the GHGEs tax with a tax on SSBs.

Methods: Two GHGEs tax scenarios are modelled:

A. a GHGEs tax of £2.72/tCO₂e/100 g product applied to all food groups with emissions greater than average;

B. As with (A) but with subsidies for food groups with low emissions to create a cost-neutral scenario.

In both of these scenarios, a 20% duty on SSBs is added.

Baseline consumption data is from the 2011 Living Cost and Food survey and food specific GHGEs are taken from a World Wildlife Fund report. The tax level is based on DEFRA marginal abatement cost curves.

Own- and cross-price elasticities are derived by estimating a hierarchical Quadratic Almost Ideal Demand system based on 32 food and drink categories from the 2011 UK Living Costs and Food Survey. Chronic disease outcomes are modelling using PRIME, a widely published comparative risk assessment model. Calories consumed from foods, milk, and alcohol are assumed to remain constant, remaining liquid calories are allowed to change.

Results: Tax A is predicted to lead to 4000 deaths averted annually and 24,000 ktCO₂/yr fewer GHGEs, and tax B is estimated to lead to 5000 deaths averted and a reduction in GHGEs of 22,000 ktCO₂/yr. Deaths averted are primarily mediated through reduced calorie intake from SSBs.

Conclusions: Combined food taxes based on GHGEs and health will reduce GHGEs and are predicted to reduce chronic disease mortality to a greater degree than taxes on GHGEs alone. More focused strategies could result in further benefits to GHGEs and health, however they would need to be carefully designed to avoid unintended negative health consequences, particularly those arising from cross-price effects.

S5.6.4

Finding the optimal fiscal food policy for public health and climate change

Wilma Waterlander¹, Adam Briggs², Anja Mizdrak², Cliona Ni Mhurchu¹, Mike Rayner², Peter Scarborough²

¹University of Auckland, Auckland, New Zealand, ²University of Oxford, Oxford, UK

SIG: Yes, Policies and environments

Awards:

Objective: Fiscal food policies are a promising intervention to address the 'real' cost of food in terms of both greenhouse gas emissions (GHGE) and mortality from diet related disease. This study aims to find the optimal combination of food price changes (taxes and subsidies) leading to the highest GHGe averted and the highest number of deaths prevented in the UK.

Methods: We used a macro simulation model (PRIME) with the following inputs: country-specific price-elasticity and GHGE data for 32 food groups and robust RR estimates linking dietary consumption with mortality. Using a Monte Carlo method, we ran 10,000 scenarios where each food group was assigned to a random price change ranging between a 50% subsidy to a 50% tax. Starting with a baseline UK diet, each price change was linked to changes in consumption via a price elasticity matrix, resulting in 10,000 alternative diets and subsequent changes in GHGe and mortality.

Results: The methods produced 10,000 simulated price changes, for which there was an overall significant positive relationship between GHGe and deaths averted. 48% of the 10,000 tax scenarios prevented deaths and reduced GHGe; 46% produced results in the desired direction for one (e.g., prevented deaths) but not the other (e.g., GHGe) outcome and 6% produced undesired results for both. The optimal scenario resulted in 32,580 deaths averted/year/UK and a reduction of 12,816 ktCO₂e/year which translates to a 28% reduction in GHGe from agriculture in the UK. In this scenario, vegetable fats (49%), poultry (44%), other meat (44%), and non-caffeinated drinks (49%) received the highest tax and other milk products (39%), fresh vegetables (37%), cheese (36%) and fruit juice (35%) received the highest subsidy.

Conclusions: There is a clear opportunity to use fiscal food policies to address both diet related disease and greenhouse gas emissions as a large number of tested tax scenarios resulted in desired outcomes for both measures. This modelling study explored relatively high taxes and subsidies, all showing that the potential positive impacts on mortality and GHGe reduced can be significant. The effects of smaller (more feasible) taxes and subsidies and different scenarios will also be presented.

S6.6 SYMPOSIUM:

The latest evidence on children's sedentary behavior measurement– validity, differentiation and health effects

Chair: Mai Chinapaw, VU University Medical Center, Amsterdam, The Netherlands

S6.6.1

Comparative validity of wearable monitors for assessing sedentary behaviour in 4-6 year-olds.

Xanne Janssen^{1,2}, Dylan Cliff¹

¹Early Start Research Institute, University of Wollongong, Wollongong, Australia, ²School of Psychological Sciences and Health, University of Strathclyde, Glasgow, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Numerous wearable monitors have been used to objectively assess sedentary behaviour in young children, although little evidence is available comparing the accuracy of different devices. This study examined the comparative validity of wearable monitors for assessing sedentary behaviour among 4-6 year-olds.

Methods: 37 children aged 4-6 years (5.3 ± 1.0 years) wore an *activPAL*, ActiGraph GT3X, Actical, and ActiWave while completing a ~150 min laboratory protocol involving age-appropriate sedentary behaviour, light and moderate-to-vigorous physical activities (e.g. watching a movie, drawing on a whiteboard, playing mini basketball). Second-by-second direct observation of posture (DO) was the criterion measure. Sedentary behaviour definitions were - ActiGraph: ≤ 25 (AG_25) and ≤ 37.5 (AG_37.5) counts(c)/15s; Actical: ≤ 6 (AC_6) and < 25 (AC_25) c/15s; and ActiWave: ≤ 46 and ≤ 26 (AW_46/26) c/15s for boys and girls, respectively. Classification accuracy was evaluated using area under the receiver operating characteristics curve (ROC-AUC). Differences in sedentary time were tested using repeated measures ANOVA.

Results: ROC-AUC was significantly higher for *activPAL* (0.87) than others (AC_6=0.80; AC_25=0.79; AW_46/26=0.77; AG_25=0.75; AG_37.5=0.75). Compared to direct observation (55.5 [51.9-59.1] min), all methods over-estimated sedentary time (*activPAL*: mean=60.3 [95%CI=54.7-65.8] min; AG_25: 67.3 [62.5-72.1] min; AG_37.5: 71.9 [66.8-77.0] min; AC_6: 72.2 [68.0-76.5] min; AW_46/26: 72.6 [63.4-81.8]; AC_25: 82.4 [77.6-87.1] min).

Conclusions: Although the *activPAL* was the most accurate device for assessing sedentary behaviour in young children and provided the smallest over-estimates of group-level sedentary time, sedentary time was over-estimated by 17%.

S6.6.2

Differentiation between various sedentary activities in youth based on objective measures (Actigraph, ActivPAL, Heart rate and EMG)

Evi van Ekris, Teatske Altenburg, Mai Chinapaw
VU University Medical center, Amsterdam, The Netherlands

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Time spent on different sedentary activities (e.g. TV viewing, reading, playing seated computer games) may have different health effects. The purpose of this study was to examine whether it is possible to differentiate between different sedentary activities from accelerometer, inclinometer, heart rate and muscle activity data in young people.

Methods: 106 children and adolescents, aged 10-12 (n=56) and 16-18 years old (n=50), performed six different sedentary activities, one standing activity and one active video game, in a controlled laboratory setting. Each activity lasted 10 minutes and was video recorded. Participants wore an Actigraph GT3X+ accelerometer on their hip (right side), both wrists and upper legs, an ActivPAL on their upper leg (right side) and a heart rate monitor (Polar RS800CX). Activity of the quadriceps and calf muscles was measured in a subgroup (n=40) using surface electromyography (EMG). A prediction model was developed using a variety of data characteristics (e.g. percentiles, absolute deviation).

Results: For all sedentary activities median and range of accelerometer counts were below the cut-point of 100 counts per minute. Descriptive data of accelerometer, inclinometer, heart rate and muscle activity revealed small differences between sedentary activities. Wrist worn accelerometers provided a greater distinctive capacity for sedentary activities than hip or leg worn accelerometers. This presentation will focus differentiation between various sedentary activities using different objective measures.

Conclusion: The results will provide important knowledge facilitating pattern recognition programs.

S6.6.3

Prospective relationship between young people's sedentary behavior and health indicators: latest evidence

Teatske Altenburg, Evi van Ekris, Mai Chinapaw
VU University Medical Center, Amsterdam, The Netherlands

SIG: No, this communication does not fit in any of the SIGs

Awards: No

The potential health effects of excessive sedentary time in children received expanding attention resulting in a large number of publications in the last few years. In this systematic review we aimed to summarize the prospective relationship between young people's sedentary behavior and health indicators.

Methods

We searched for relevant studies in PubMed, EMBASE, PsychInfo and Cochrane through October 2014. Two reviewers independently screened the titles and abstracts eligibility, rated the methodological quality and extracted data. We performed a best evidence synthesis to synthesize the results weighing methodological study quality.

Results

We included 58 studies with quality scores ranging from 25 to 100%. Six studies were scored as high quality. We found inconsistent evidence for a longitudinal relationship between objective and subjectively assessed sedentary time and indicators of body composition (i.e. BMI, skinfolds, waist-circumference, %body fat). We found moderate evidence, based on one high-quality and three low-quality studies) for a relationship between sedentary time and aerobic fitness. Moreover, insufficient evidence was found for a relationship between sedentary time and blood pressure, blood lipids, musculoskeletal pain, fatigue, artery diameter, obstipation and bone mass. The symposium presentation will highlight differences in health effects stratified by type of sedentary behavior measure.

Conclusion

Our systematic review suggests moderate evidence for an inverse longitudinal relationship between sedentary time and aerobic fitness. As high-quality studies are scarce, the possible health effects of sedentary time on other health indicators need further study.

S7.6 SYMPOSIUM:

Dimensions of nutrition knowledge and its impact on food intake

Chair: Sonja Mötteli, ETH, Zurich, Switzerland

S7.6.1

Citizens' views of the food knowledge required by food consumers.

Anthony Worsley
School of Exercise and Nutrition Sciences, Deakin University, Melbourne, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Most studies of food knowledge have focused on declarative forms of nutrition knowledge. In recent years, however, the importance of other related forms of food knowledge such as procedural knowledge relating to domestic food transformation and food sustainability have begun to be regarded more seriously in education and public health circles. This raises the question as to which types of knowledge are useful for people in their daily lives.

Methods: We have conducted a series of studies over the past five years to explore answers to this question. In this paper I will summarise findings from some of these studies and will focus on a recent survey conducted in five countries in the Asia Pacific Region, which examined family food providers' views of the different types of food knowledge that citizens require along with some of their demographic and psychographic associations.

Results: The findings show that family food providers in all five countries share similar views about the importance of different types of food knowledge and that these views are related to within country factors, personal values, and other factors. These views of essential food knowledge are also linked to views about the promotion of healthy food and the control of food marketing.

Conclusions: This work suggests key areas, which might be included in children's food and health curricula and in particular the importance of integrating the acquisition of daily food skills and declarative knowledge in these curricula. However, more research is required to examine the mediating role of food knowledge in dietary habits.

S7.6.2

How to assess consumers' ability to interpret nutrition/health-related messages and their promised benefits

Violeta Stancu¹, Klaus G. Grunert¹, Hans Jørn Juhl¹, Leonardo Casini², Caterina Contini², Caterina Romano², Gabriele Scozzafava², Liisa Lähteenmäki¹

¹MAPP Centre, Business and Social Sciences, Aarhus University, Aarhus, Denmark, ²Dipartimento di Gestione dei Sistemi Agrari, Alimentari e Forestali, University of Florence, Florence, Italy

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Health-related messages are shown to have an impact on consumer perception of other product attributes, but we know less about how consumers interpret the possible health outcomes of such messages. Consumers need to rely on their existing knowledge in assessing health claims and this may create interpretations that go beyond what the message promises; some of these inferences can be justified, some are vague or exaggerated benefits, whereas others are clearly false. The aim was to study whether a simple rating method can be used to assess consumers' ability to interpret nutrition/health-related messages and their promised benefits.

Methods: The rating method consisted of 15 items that could be divided into safe, risky, vague, unrelated, and risk reduction interpretations of the benefit included in the claim. These items were selected based on pilot interviews. In a survey, Danish (n=1024) and Italian (n=1000) respondents were presented with one claim out of three claims (EU-approved wording, simplified wording, risk reduction claim) that were all related to heart health. To control for response tendencies, four indices for safe interpretation were calculated as difference between the mean of safe items and means of other categories.

Results: In the ratings, consumers agreed stronger with the safe rather than most of the other types of statements, especially the clearly false unrelated interpretations. Respondents agreed strongly with the risk reduction potential of the claim promising this benefit, but scored lower on the safe function-related interpretations in the risk reduction health claim condition. Of the two groups who saw a function-related health claim, those in the simplified claim condition interpreted the claim as having risk reduction potential, while this was not the case for the EU-approved claim.

Conclusions: The rating method was simple to apply and suggested that consumers are able to make safe interpretations of health claims rather than less safe ones. Consumers recognize the risk reduction benefits of risk reduction health claims, but do not always link them with the functions behind the benefits. However, the method can be biased by consumers' response tendencies. The pre-selection of items is a crucial step in applying the items.

S7.6.3

Development and validation of two applied nutrition knowledge scales

Sonja Mötteli, Jana Barbey, Carmen Keller, Tamara Bucher, Michael Siegrist
Consumer Behavior, Institute of Environmental Decisions (IED), ETH Zurich, Zurich, Switzerland

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Nutrition knowledge is suggested to play an important role in making healthy food choices. However, correlations between nutrition knowledge and food intake are modest and existing measures have been criticized in terms of psychometric properties and practical relevance. The aim of our studies was to develop two applied nutrition knowledge scales that overcome those limitations and contribute to a better understanding of food choice decisions.

Methods: In the presented studies, we developed and validated two new scales using an item response theory approach. First, items were developed in an elaborated process, considering nutrition guidelines, actual food consumption and existing nutrition knowledge measures. In a pre-study, the items were reviewed by nutrition experts and laypersons. In a subsequent research step, the items were tested in a large sample of randomly selected Swiss adults from the general population (N=526). In several follow-up studies we evaluated the validity and reliability of these scales, performed as self-administered paper-and-pencil and online surveys in the German and French-speaking Switzerland.

Results: The first scale aims at measuring knowledge about food calories, whereas the second scale aims at quantifying the understanding of a balanced meal. We discussed our results by comparing the newly developed scales with established nutrition knowledge measures and in relation to health factors. We propose, that these dimensions of nutrition knowledge are required to follow a balanced and low calorie diet, which is important to maintain a healthy body weight.

Conclusions: The presented studies contribute to a better understanding of nutrition knowledge and its role in making healthy food choices. Regarding the increasing overweight rates, promoting healthy eating patterns is an issue of major concern. However, further studies are needed to investigate the impact of nutrition knowledge, assessed by the newly developed scales, on food intake.

S8.6. SYMPOSIUM:**Behaviour change interventions for adults with intellectual disabilities**

Chair: Mona Bjelland, University of Oslo, Oslo, Norway

S8.6.1**Outcomes of a randomised controlled trial of the Walk Well intervention**

Fiona Mitchell¹, Nanette Mutrie², Kirsten Stalker⁴, Lynsay Matthews³, Louise Bleazard¹, Chris Melling⁵, Heather Murray¹, Craig Melville¹
¹University of Glasgow, Glasgow, UK, ²University of Edinburgh, Edinburgh, UK, ³University of the West of Scotland, Hamilton, UK, ⁴University of Strathclyde, Glasgow, UK, ⁵Glasgow City Council, Glasgow, UK

SIG: Yes, Socioeconomic inequalities

Awards:

Objective: Many adults with intellectual disabilities lead very sedentary lives. There are no published randomised controlled trials (RCTs) of walking interventions for adults with intellectual disabilities. This study examined whether a RCT of a walking intervention supported participants to increase walking, PA, health and well-being of adults with intellectual disabilities.

Method: 102 adults with a range of intellectual disabilities were randomised to a walking intervention group or a waiting list control group. The intervention was based on the transtheoretical model of behaviour change and consisted of three PA consultations (baseline, six weeks and 12 weeks) and an individualised 12 week walking programme. All outcome measures were collected by a researcher who was blind to the study groups. The primary outcome was steps walked per day, measured using accelerometers. Secondary outcome measures included: time spent in moderate-vigorous PA per day, time spent in sedentary behaviour per day, and anthropometric measures to monitor weight change. A repeated measures model was used to examine differences in steps/day and secondary outcomes between the two groups.

Results: Eighty four participants completed the intervention and data collection. Data analysis is currently being carried out. Twenty one participants with mild-moderate ID and two carers of participants with more severe ID described their views of the intervention during semi-structured qualitative interviews and focus groups. Secondary measures examining quality of life and self-efficacy were analysed by logistic regression models between the intervention and control group.

Conclusion: As there are currently no published controlled studies of walking interventions for adults with intellectual disabilities, this study can serve as framework or model for future walking and PA interventions for adults with intellectual disabilities.

S8.6.2**Health promotion for adults with intellectual disabilities – the Swedish experience**

Liselotte Schäfer Elinder, Helena Bergström, Elinor Sundblom
 Karolinska Institute, Stockholm, Sweden

SIG: Yes, Socioeconomic inequalities

Awards:**Objectives:**

We developed and evaluated outcomes and process of a novel health promotion programme, based on social cognitive theory, targeting adults with intellectual disabilities (ID) and caregivers in community residences. The programme components were: 1) Appointment of a health ambassador in each residence; 2) study circle for caregivers; and 3) health course for residents.

Methods:

Two studies examining the program effectiveness were carried out. The design of the first study was a cluster-randomized controlled trial with 30 residences and 130 residents. Participants' physical activity levels and diet, and caregiver work routines were measured at residence and resident level. The second study used a quasi-experimental design to examine whether the study-circle component changed work routines in 84 community residences in eight municipalities. Seventy residences completed the second study. Interviews were conducted with managers and health ambassadors in the first study, and in the second study with local coordinators as well in order to understand the implementation process, by use of content analysis.

Results:

There was a significant increase in the physical activity of participants in the first study (increase in steps/day = 1608; $p = 0.045$). No intervention effect was seen regarding diet of residents. Both studies found a significant improvement in the frequency of health promoting work routines of caregivers. Process evaluations in the two studies found that the important themes to support motivation for change among managers, caregivers and residents were intervention characteristics, individual commitment, organisational capacity, organisational structure in the municipality and wider societal factors.

Conclusions:

The programme has been very well received among Swedish municipalities who perceive a great need to work systematically with health promotion regarding diet and physical activity for adults with ID. Ten new municipalities have signed up for a third study. A manual has been produced and the focus will now be to evaluate how well municipalities can implement the programme with fidelity with minimal support from the research team. It remains to be demonstrated how to improve dietary habits in this vulnerable group and adequate dietary assessment methods have to be developed which are sensitive enough to measure intervention effects.

S8.6.3

Increasing habitual physical activity of people with ID, through changing the behaviour of caregiversThessa Hilgenkamp¹, Heleen Evenhuis^{1,2}¹Erasmus M.C., Rotterdam, The Netherlands, ²University Medical Center, Rotterdam, The Netherlands**SIG:** Yes, Socioeconomic inequalities**Awards:****Objective:**

Professional caregivers play an important role in supporting healthy behavior of people with intellectual disabilities (ID). To promote physical activity, it is necessary to target professional caregivers as well as people with ID themselves. The aim of this study was to change the behaviour of professional caregivers towards providing more physical activity support, in order to increase habitual physical activity levels of their clients with ID.

Methods:

Intervention mapping was used to design a multicomponent intervention, including a health check, education, demonstrations of suitable activities in and around the living facility, personal goal-setting, coaching of the professional caregivers, and rewards, all delivered by a physical activity specialist. People with ID were recruited from supported, community-based living facilities in the Netherlands. After informed consent, participants with ID and their professional caregivers underwent a control period of 12 weeks ('waiting list procedure'), followed by an intervention period of 24 weeks. Motivation for change and perceived barriers of both people with ID and the professional caregivers, were assessed with adapted questionnaires. Furthermore, physical activity (pedometers), fitness (Short Physical Performance Battery), health (length, weight, BMI, hip and waist circumference and blood pressure) and daily functioning (Barthel Index and Lawton IADL scale) were measured. All measurements were completed at the start and at the end of the control period to determine baseline levels and baseline variability. These baseline levels were compared to the results at the end of the intervention period, to determine the effects of the program.

Results:

115 People with ID and their professional caregivers participated in this study. Of these 115 participants, 60 were male, and the mean age (and standard deviation) was 50.8 (17.2) years. Professional caregivers reported a significant increase in motivation and a reduction in the number of perceived barriers to change. Analysis of the other outcome measures is ongoing and will be reported in full.

Conclusions:

Initial findings suggest that the multi-component intervention was acceptable to individuals with ID and caregivers. There is a need for controlled studies to examine if the intervention is effective in improving the health and wellbeing of adults with ID.

S1.7. SYMPOSIUM:

Obesogenicity of social and physical environments across Europe – findings from the SPOTLIGHT project

Chair: Jeroen Lakerveld, EMGO, Amsterdam, The Netherlands

S1.7.1

Sampling neighbourhoods in environmental studies on obesity: a cross-European approach

Hélène Charreire¹, on behalf of the SPOTLIGHT consortium²
¹IEREN Inserm Unit 557, Inra Unit 1125, Cnam, Epidemiology and biostatistics research center Sorbonne Paris Cité, University Paris 13 Paris-cité-Sorbonne, Paris, France, ²Coordinating office: EMGO Institute for Health and Care Research, Amsterdam, The Netherlands

SIG: No, this communication does not fit in any of the SIGs**Awards:**

Purpose: To provide data of relevance for obesity prevention policies, studies focusing on relationships between environmental characteristics, EBRBs and obesity should be performed in a variety of contexts and/or countries. In such studies, there is a need for innovative sampling designs, at neighbourhood level, that will ensure variability of environmental characteristics of neighbourhoods within cities as well as comparability of neighbourhoods between cities/countries. We describe a methodological approach developed in the SPOTLIGHT project for defining categories of urban neighbourhoods.

Methods: Study areas are five large European cities or urban zones: Ghent and suburbs (Belgium), Paris and inner suburbs (France), Greater London (UK), Budapest and suburbs (Hungary) and the Randstad (conurbation including Amsterdam, Rotterdam, The Hague and Utrecht in the Netherlands). Two environmental variables assumed to be related with obesity were selected for integration into a GIS: urban residential density and neighbourhood socio-economic status (SES). To test the relevance of urban neighbourhood patterns, we compared the prevalence of childhood obesity across categories.

Results: We first identified a European wide GIS database, the Urban Atlas, to obtain the same data on urban residential area density (low, medium, high) in all 5 study areas. We categorized SES (low, medium, high) based on median income data from national census databases available in each of the 5 countries. Using GIS-based tools, four urban patterns were then defined in a 2x2 grid combining low/high urban residential density and low/high SES. A sample of 10 neighbourhoods were randomly selected in each of the 4 urban patterns (n=40) and was used to analyse the distribution of childhood obesity prevalence in Greater London, based on prevalence data from the National Child Measurement Programme (England). For 10-11 years old, the lowest prevalence was found in low urban residential density/high SES neighbourhoods (17.5%), the highest in high urban residential density/low SES neighbourhoods (26.8%).

Conclusions: We developed a process that provides the basis for sampling neighbourhoods in studies on environmental factors associated with chronic disease such as obesity. It will be used to compare environmental characteristics across European countries and their relationships with energy-related behaviours and obesity in the SPOTLIGHT project.

S1.7.2

Country and neighbourhood differences in energy-balance related behaviors: a cross-sectional study

Sofie Compernelle¹, On behalf of the SPOTLIGHT consortium²
¹*Department of Movement and Sport Sciences, Faculty of Medicine and Health Sciences, Ghent University, Ghent, Belgium,*
²*Coordinating office: EMGO Institute for Health and Care Research, Amsterdam, The Netherlands*

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Although overweight and obesity are present across all European countries and neighbourhood types, certain subgroups are at higher risk to develop weight problems. Therefore, this study aimed to describe adults' energy-balance related behaviors (EBRBs) and body mass index (BMI) in five European countries and to examine cross-country and cross-neighbourhood differences.

Methods: A cross-sectional survey was conducted among adults recruited from four neighbourhood types (high socio-economic status [SES] - high residential area density [RAD], high SES - low RAD, low SES - high RAD, low SES - low RAD) between February and September 2014 in The Netherlands, Hungary, the United Kingdom, France and Belgium. The survey, assessing socio-demographic characteristics, EBRBs and determinants of EBRBs, was completed by 6038 adults. Descriptive statistics of EBRBs were applied to present means and standard deviations and analyses of covariance were performed to assess cross-country and cross-neighbourhood differences.

Results: European adults spend on average 537.69 (SD: 224.11) min/day on sedentary activities, and 81.18 min/day (SD: 88.38) on physical activities during transport and leisure time. The average number of servings per week was 7.20+- 4.97 for fruit, 7.19 +-3.74 for vegetables, 1.10+-0.56 for fast food and 3.96+-3.06 for sweets. Almost half of the participants were overweight (44.6%), and 12.0% were obese. Significant differences were found for all EBRBs and for BMI between countries and between neighbourhood types. More favourable eating behaviors were reported in high SES neighbourhoods ($p < 0.01$ for fruit, vegetables intake and fast food consumption), and significantly less sedentary behavior was found in low RAD neighbourhoods. BMI was highest in European adults living in low SES neighbourhoods.

Conclusions: Both country and neighbourhood type are important correlates of adults' EBRBs and BMI. More research is needed to identify the factors that can explain the country- and neighbourhood differences in EBRBs and obesity.

S1.7.3

Neighbourhood social environment: definitions, measures and associations with obesity - a systematic review

Ketevan Glonti¹, On behalf of the SPOTLIGHT consortium²
¹*European Centre on Health of Societies in Transition, London School of Hygiene and Tropical Medicine, London, UK,*
²*Coordinating office: EMGO Institute for Health and Care Research, Amsterdam, The Netherlands*

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: The aim of this systematic review was to assess definitions, measures and the strength of associations between the neighbourhood social environment and adult obesity reported in the literature.

Methods: We reviewed original studies that investigated the association of social environmental constructs such as collective efficacy, social capital, social cohesion, social support and sense of belonging within neighbourhoods and obesity in adults. Studies were included if they were: conducted on the general adult population; the outcome was overweight/obesity, carried out in a developed country, investigated at least one social environmental construct; not limited to specific population groups (e.g. migrants, elderly etc.); not focused solely on socioeconomic status; and did not presented original research (e.g. excluding reviews, case reports, editorials, commentaries, discussions or letters). Six databases for primary studies were searched: EMBASE, MEDLINE, PsycINFO, Scopus, Web of Science and the Cochrane Library. We restricted our search to studies published in English between January 1995 and September 2014. A quality appraisal tool was used to evaluate methodological quality of the included studies.

Results: Out of 8,348 screened records, 66 articles were assessed using full-text. A total of nine studies were included. The strongest associations with reduction in the odds of being overweight and/or obese were found for social capital and collective efficacy, although few studies found statistically significant associations. There was heterogeneity in the definitions and metrics of social environmental constructs.

Conclusion: There is some evidence that higher social capital and collective efficacy are associated with lower obesity rates, but the research conducted on adults to date has not robustly identified statistically significant relationships. We highlight challenges to undertaking research and establishing causality in this field, provide recommendations for further research, and propose consistency in the definitions of terms.

S1.7.4

Social capital and its relation with energy balance related behaviours, BMI and general health across Europe

Joreintje Mackenbach, On behalf of the SPOTLIGHT consortium
The EMGO Institute for Health and Care Research, Amsterdam, The Netherlands

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: Previous studies have provided evidence for a positive influence of social capital (SC) on health. Ecological models suggest that SC, as part of the social environment, could play an important role in energy balance related behaviours (EBRBs) and consequent health outcomes such as obesity. While strong social networks and high social capital could result in collective healthy EBRBs, the reverse (collective unhealthy EBRBs) may be just as likely. The research question for this study was whether aspects of SC were related to EBRBs, obesity and perceived general health in a European context.

Methods: In this cross-sectional, observational study, 60 neighbourhoods - heterogeneous in SES and residential density - were selected in five European countries. A random selection of adults in these neighbourhoods received invitations to participate in an online survey. 4977 adults provided information on demographics, aspects of SC, EBRBs (food intake, physical activity, and sedentary behaviour), length and weight, and perceived general health. Factor analysis identified two SC factors: social cohesion and social networks. Ecometric methods were used to aggregate social cohesion and social networks to neighbourhood level. Multilevel linear regression analysis, with neighbourhoods and individuals as levels, were conducted to examine associations of aggregate social cohesion and social network measures with EBRBs, body mass index (BMI) and perceived general health.

Results: Preliminary results suggest that levels of SC, BMI and perceived general health differed significantly between countries and neighbourhood types. Stronger social cohesion and stronger social networks were significantly associated with lower BMI and better perceived general health. Furthermore, stronger social cohesion and social network was associated with both healthy behaviours (such as higher fruit and vegetable intake) and unhealthy behaviours (higher intake of sweets, more sitting and less active transport).

Conclusions: Preliminary results suggest that aspects of social capital are potentially important correlates of EBRBs, weight status and general health. While aspects of social capital seem to be related to better health and weight status, it was also related to both healthy and unhealthy EBRBs.

S2.7. SYMPOSIUM:

Measuring sedentary behavior across the lifespan: issues of subjective and objective instruments

Chair: Katrien De Cocker, Ghent University, Ghent, Belgium

S2.7.1

Validity of a questionnaire assessing sedentary behavior in adolescents, adults and seniors

Cedric Busschaert^{1,2}, Katrien De Cocker^{1,2}, Greet Cardon¹, Ilse De Bourdeaudhuij¹

¹*Ghent University, Ghent, Belgium*, ²*Research Foundation Flanders (FWO), Brussels, Belgium*

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To examine the criterion validity of a context-specific sedentary behavior questionnaire (11-12 contexts depending on age group) in adolescents, adults and seniors.

Methods: Cross-sectional data were retrieved from three different samples participating in a larger study, Flanders (Belgium), on determinants of sedentary behavior. Sixty-two adolescents (age: 16.14 ± 1.10; males: 41.9%) from four schools, 33 adults (age: 46.63 ± 10.50; males: 36.4%) and 33 older adults (age: 72.16 ± 4.35; males: 60.6%) obtained via a city's public service department, were randomly selected to participate in this study. Participants had to wear a thigh-mounted ActivPAL (criterion measurement) for seven consecutive days. All participants wore the ActivPAL at least 4 days (including 1 weekend day). On the eighth day, an age-specific sedentary behavior questionnaire, based on the SIT-Q-7d, was completed (adolescents and adults: paper-pencil; older adults: structured interview). Spearman correlations and Bland-Altman plots (or non-parametric approach) were used to analyze criterion validity, separately for the three different age groups and for weekday, weekend days and an average day.

Results: Spearman correlations between self-reported total sitting time and the criterion measurement were different for each age group and type of day (for weekdays, weekend days and average day respectively: adolescents: $\rho=0.37$, $\rho=0.13$, $\rho=0.33$; adults: $\rho=0.53$, $\rho=0.06$, $\rho=0.50$; older adults: $\rho=0.50$, $\rho=0.38$, $\rho=0.48$). The Bland-Altman approach or non-parametric approach showed that participants over-reported their total sitting time (except for weekend days in older adults) compared to the criterion measurement, for weekdays, weekend days and average day respectively: +31.72%, +19.25%, +27.54% in adolescents; +34.18%, +16.61%, +27.88% in adults; +10.10%, -6.24%, +4.11% in older adults.

Conclusions: Correlational analyses showed overall fair-to-moderate validity, but stronger validity for adults and older adults were found compared to adolescents and weaker validity on weekend days. Validity results suggest that older adults were more capable to correctly estimate their total sitting time, probably due to the structured interview protocol.

S2.7.2

Validation and application of previous day recalls for measuring active and sedentary behavior

Sarah Keadle, Charles Matthews
National Cancer Institute, Bethesda, USA

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To elucidate health associations and develop more effective interventions, the full spectrum of human behavior (sedentary through vigorous intensity activity), context (where and why) and the timing (e.g., morning/evening) may need to be considered. The purpose of this presentation is to highlight the utility of an emerging approach to measuring contextual information and a range of human activities using previous day recall (PDRs). This presentation will summarize recent validation work for the method and describe novel applications in population-based studies.

Methods: This first portion of the presentation will include two free-living validation studies of the PDR; one compared to the activPAL (N=179 adolescents and adults), and the other compared to direct observation (DO) (N=33 adolescents and adults). The second portion of the talk will describe results from applications of the method in a recently conducted descriptive study in 400 adults and adolescents. Participants completed three PDRs at baseline and three additional PDRs 3-months later to inform where and why active and sedentary behaviors occur. We will also draw from other examples in the literature that have validated and applied PDRs to address novel research questions.

Results: Compared to the activPAL a PDR provides accurate and precise estimates of active ($r = 0.52-0.80$) and sedentary ($r = 0.60-0.81$) behaviors and has low systematic error. PDR reported location agreement with 85% or greater for each location compared to DO for adults and 81% or greater for adolescents. In the application portion, results of the most commonly reported active and sedentary behaviors within each location will be presented based on the ~2400 completed PDRs, with an emphasis on time-use trade-offs between exercisers/non-exercisers, weekend/weekday and population sub-groups.

Conclusions: As research emerges that the full spectrum of human activity/behaviors (e.g., sleep, sedentary, vigorous) are important determinants of overall physical activity levels and health, PDRs are a valuable measurement tool. PDRs can provide an understanding of where and why active and sedentary behaviors take place which may be fundamental information to develop for more effective interventions. This presentation will provide an overview of recent novel validation and application studies using PDRs to inform sedentary behavior researchers.

S2.7.3

Validity and sensitivity to change of self-report and objective measures of sedentary behaviour in adults and older adults.

Philippa Dall¹, Claire Fitzsimons², Elaine Coulter³, Dawn Skelton¹, Sebastien Chastin¹

¹Glasgow Caledonian University, Glasgow, UK, ²University of Edinburgh, Edinburgh, UK, ³University of Glasgow, Glasgow, UK

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: The sedentary behaviour research agenda is now focussed on developing intervention studies to change sedentary behaviour. However, the ability to both detect and to quantify any resulting change in sedentary behavior is critical to the success of this phase of research.

Methods: We report preliminary results of a systematic programme of investigation of the validity and sensitivity to change of both objective and self-report measures of sedentary behaviour. The ability to detect true and meaningful change in intervention studies and population surveillance is strongly influenced by the choice of measurement instrument, study design and outcome measure. Throughout this work, sensitivity to change is established based on the Beaton taxonomy of measure of responsiveness. As part of the Seniors USP study, a systematic inventory of self-reported measures of sedentary behaviour in adults and older adults was conducted in 2014 (protocol published in PROSPERO 2014:CRD42014009851). A taxonomy was established, based on recall period, temporal scale and type of assessment, to provide a systematic comparison for all self-report tools. For objective measures, assessment of sensitivity was based on data from two published intervention studies using the most commonly used sensors (activPAL and Actigraph).

Results: A taxonomy of self-reported measures of sedentary behaviour was constructed from 133 individual items, identified from over 20 named tools and national health survey questionnaires. The most commonly used self-report format was a 7-day recall period, asking about a representative day within that period. When compared to objective measures of sitting, examples of this format tend to underestimate sedentary time by 2 to 4 hours. For objective measures, the minimal detectable change in sitting time for an individual was around 3%. Preliminary results indicated that metrics quantifying the duration and frequency of bouts of sedentary behaviour were the most sensitive outcomes in longitudinal and experimental study designs.

Conclusion: A taxonomy can be used to reduce the large number of self-report tools into a smaller set of question categories, to facilitate investigation of validity and sensitivity. For objective measures, there was a minimal detectable change of 3%, and pattern metrics were generally more sensitive to change than volume metrics.

S2.7.4

How many days of monitoring are needed to assess sedentary time using the SenseWear?

Nicola Ridgers¹, Jill Hnatiuk¹, Anna Timperio¹, Lisa Barnett¹, David Lubans², Jo Salmon¹

¹Deakin University, Melbourne, Australia, ²University of Newcastle, Callaghan, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: The SenseWear Armband is a pattern-recognition monitor that integrates motion sensor data with heat-related sensors to determine free-living energy expenditure and physical activity. The SenseWear is capable of determining off body time, removing the need to apply non-wear criteria that influence sedentary time estimates. Few studies to date, however, have used this monitor to examine sedentary time in children. The aim of this study was to determine how many days of monitoring are needed to reliably estimate children's waking sedentary time.

Methods: Eighty-seven children aged 7-11 years from 5 schools in Melbourne, Australia, participated in the study. Sedentary time (defined as ≤ 1.5 METs) was measured for eight consecutive days using the SenseWear Armband (BodyMedia Inc, USA) worn on the back of the upper left arm. Anthropometric (height, weight) and demographic (sex, age) data were also collected. Children's daily waking sedentary time was determined using BodyMedia Proprietary software (version 7). Five valid day wear time criteria were examined (8hrs/day, 10hrs/day, 12hrs/day, 14hrs/day, 16hrs/day). Intra-class correlation coefficients estimated the reliability for any individual day for each wear time criteria. Spearman-Brown prophecy formula was used to determine the number of days of monitoring needed to achieve reliability estimates of 0.7, 0.8 and 0.9.

Results: The number of days needed to reliably estimate waking sedentary time decreased as the daily valid wear time criteria required increased. To achieve a reliability of ≥ 0.7 , 7.3 days with more than 8hrs/day wear time were required. In this sample, 75% of children wore the monitor for the specified time. In contrast, 4.9 days of 16hrs/day wear time were required to achieve a reliability of ≥ 0.7 (72% compliance). Five days of 12hrs/day wear time provided acceptable reliability (≥ 0.7) whilst maximising sample compliance (84%).

Conclusions: These initial findings suggest that to reliably assess waking sedentary time in primary school children using the SenseWear Armband, 5 days of 12hrs/day wear time are required.

S3.7. SYMPOSIUM:

Evaluating The Travel And Physical Activity Impacts Of Transport Infrastructure Projects

Chair: David Ogilvie, University of Cambridge, Cambridge, UK

S3.7.1

Assessing changes in bicycle infrastructure in Curitiba, Brazil

Adriano Hino, Rodrigo Reis, Marilson Kienteka
Pontificia Universidade Catolica do Parana; Federal University of Parana, Curitiba, Brazil

SIG: Yes, Policies and environments

Awards: No

Purpose: Improving bicycle infrastructure may help promote physical activity and improve cities' quality of life. However, there is limited experimental evidence of the effects of such changes and nearly all the available evidence is from high-income countries. This study analysed the impact of changes to bicycle infrastructure on patterns of cycling in Curitiba, Brazil.

Methods: Natural experimental study conducted in three areas of the city. Two areas received major transformations - implementation of bike lanes, traffic lights and signage - and were defined as experimental areas. A third area was selected as a control and did not receive any transformation. All areas were assessed before and after the implementation of the bicycle infrastructure through images recorded by the city's Traffic Operational Control Centre. The follow-up period included three waves of observation 45 days apart. Images were analysed over a period of twelve consecutive hours on a weekday (0700 to 1900) using a validated protocol. Patterns were compared using chi-square tests and logistic regression.

Results: At baseline across all three sites, the average number of cyclists was 730 (95% confidence interval [95% CI] 695, 792). This did not vary significantly between control and experimental areas (prevalence ratio [PR] 1.1, 95% CI 0.9, 1.2). After the intervention the number of cyclists increased in the experimental areas (PR 1.2, 95% CI 1.0, 1.3) and did not change in the control area (PR 1.1, 95% CI 0.9, 1.2), although after the second follow-up no significant differences were found in either experimental ($p=0.12$) or control areas ($p=0.13$). Nonetheless, while the bus rapid transit corridor was the preferred choice for 49% of all bike trips at baseline, after implementation 72% of bike trips were observed in the bike lanes.

Conclusions: The changes in the bicycle infrastructure have not increased the use of bicycles, but have positively affected the pattern of use in the areas affected. This suggests that changing the physical environment alone may not produce sustainable changes in the use of the bicycle as a mode of transport, and that changes in the social and political environment may also be needed.

S3.7.2

Walking and Bus Rapid Transit in Bogotá, Colombia

Olga Sarmiento¹, Pablo Lemoine¹, José Meisel¹, Felipe Montes¹, Dario Hidalgo², Enrique Jacoby³, Juan Cordovez¹, Roberto Zarama¹

¹Universidad de los Andes, Bogotá, Colombia, ²EMBARQ, the WRI Center for sustainable transport, Bogotá, Colombia, ³Pan American/World Health Organization, Lima, Peru

SIG: Yes, Policies and environments

Awards:

Purpose: Transport infrastructure and active travel can play a significant role in reducing physical inactivity. However, few studies have evaluated the relationship between changes in major transport infrastructure and health outcomes. Bus Rapid Transit (BRT) has been implemented in over 160 cities worldwide. Bogotá, Colombia has been recognized for its growing BRT system, TransMilenio. The purpose of this research was to assess the association between walking behaviour and use of and access to TransMilenio among adults in Bogotá in 2005 and 2010-11.

Methods: Cross-sectional studies carried out in 2005 and 2010-11 were combined in a post-hoc analysis to conduct a cross-sectional and a cohort analysis. The cross-sectional sample for 2010-11 consisted of 1,000 adults. A subsample of 250 adults had objective physical activity measures using Actigraph GT3X accelerometers. A subsample of 360 adults could be analyzed over time. Analyses were conducted using multilevel Poisson models and generalized additive models.

Results: Adults sampled in 2010 were more likely to meet physical activity recommendations than those sampled in 2005 (prevalence ratio [PR] 1.9, 95% confidence interval [CI] 1.4, 2.6). TransMilenio users were more likely to walk for transport ≥ 150 min/week (PR 1.2, 95% CI 1.1, 1.4), and to complete an average of >22 min/day of moderate or vigorous intensity physical activity (PR 1.4, 95% CI 1.1, 1.6) than adults who did not use TransMilenio, and adults living in geographic units that had TransMilenio stations were also more likely to walk for transport ≥ 150 min/week (PR 1.4, 95% CI 1.0, 2.0) than those living in units without TransMilenio access.

Conclusions: Use of and access to TransMilenio was associated with more walking for transport. BRT and other major transport infrastructure projects are a promising strategy to enhance public health efforts to reduce physical inactivity.

S3.7.3

The impact of new transport infrastructure on commute mode share and trip frequency in Cambridge, UK

Eva Heinen¹, Jenna Panter¹, Roger Mackett², David Ogilvie¹

¹University of Cambridge, Cambridge, UK, ²University College London, London, UK

SIG: Yes, Policies and environments

Awards:

Purpose: To evaluate the effects of a major new transport infrastructure project - comprising a new traffic-free path for pedestrians and cyclists and a new bus service - on commuter travel behaviour.

Methods: The intervention was the introduction of the Cambridgeshire Guided Busway in 2011 in Cambridge, UK. Data were collected by post annually between 2009 and 2012 as part of a natural experimental cohort study. For this analysis we used data from 470 participants taking part in both the first (pre-intervention) and last (post-intervention) survey waves. Exposure to the intervention was defined using the negative square root of the shortest distance from home to busway. Three outcomes were modelled: change in mode share and change in number of trips - both based on a seven-day travel-to-work record at both time points - and change in commute distance. Changes in three specific mode shares were investigated: trips involving any active travel, trips involving any public transport and trips made by entirely by car. Separate multinomial regression models were estimated adjusting for commute and sociodemographic characteristics, residential settlement size and life events.

Results: Proximity to the busway predicted an increased likelihood of a large ($>30\%$) increase in active travel mode share (relative risk ratio [RRR] 1.80, 95% CI 1.27, 2.55) and a large decrease in car mode share (RRR 2.09, 95% CI 1.35, 3.21) as well as a reduced likelihood of a small ($<30\%$) decrease in active travel mode share (RRR 0.47, 95% CI 0.28, 0.81). It was not associated with changes in the number of trips or commute distance.

Conclusions: The new infrastructure promoted an increase in the share of commuting trips involving active travel and a decrease in the share made only by car. Exposure to the intervention was the most important factor in predicting these changes, even compared with moving home or workplace. This analysis demonstrates effects on travel behaviour with potential impacts on population activity patterns and health. Further analysis will show the extent to which the changes in commute mode share were translated into an increase in time spent in active commuting and consequent health gain.

S3.7.4

The impact of new transport infrastructure on time spent in active commuting and physical activity in Cambridge, UK

Jenna Panter¹, Eva Heinen¹, Roger Mackett², David Ogilvie¹
¹University of Cambridge, Cambridge, UK, ²University College London, London, UK

SIG: Yes, Policies and environments

Awards:

Purpose: To evaluate the effects of a major new transport infrastructure project - comprising a new traffic-free path for pedestrians and cyclists and a new bus service - on time spent in active commuting and physical activity.

Methods: We evaluated the Cambridgeshire Guided Busway using a quasi-experimental analysis nested within a cohort study of commuters, the Commuting and Health in Cambridge study. Adults living within 30km of Cambridge and working in areas of the city to be served by the new transport infrastructure were recruited through a predominantly workplace-based strategy. Participants completed questionnaires at baseline prior to the intervention (2009) and at follow-up (2012). Our primary outcome was change in weekly time spent in active commuting, measured by validated seven-day recall instrument. Secondary outcomes were changes in total weekly time spent walking and cycling and in recreational and overall physical activity, measured using the Recent Physical Activity Questionnaire (RPAQ). Exposure to the intervention was defined using the shortest distance from each participant's home to the busway.

Results: 1143 participants provided valid data on the primary outcome at baseline, and of these 470 provided valid data on the primary outcome three years later. In multivariable multinomial regression models - adjusted for potential sociodemographic, geographic, health and workplace confounders, baseline active commuting and home or work relocation - exposure to the busway was associated with a significantly greater likelihood of an increase in weekly cycle commuting time (RRR 1.34, 95% CI 1.03, 1.76) and weekly total cycling time (RRR 1.32, 95% CI 1.04, 1.68), and with an increase in overall time spent in active commuting among the least active commuters at baseline (RRR 1.76, 95% CI 1.16, 2.67).

Conclusions: Providing new infrastructure designed to promote sustainable transport was effective in promoting an increase in time spent in active commuting. We did not find a significant effect on overall physical activity, but the study was not powered to detect such an effect and active commuting is associated with health benefits in its own right. These findings support reconfiguring transport systems as part of a public health strategy to shift population physical activity patterns.

S4.7. SYMPOSIUM:

Advances and issues in measuring parenting related to children's nutrition and physical activity behaviors

Chair: Teresia O'Connor, Baylor College of Medicine, Houston, Texas, USA

S4.7.1

Anything to make her smile: A conceptual framework for parenting practices around child snacking among low-income caregivers of preschoolers

Jennifer Fisher¹, Christine Blake², Rachel Blaine³, Nicholas Younginer², Claudia Gehre³, Alexandria Orloski¹, Yasmeen Bruton¹, Kirsten Davison³

¹Temple University, Philadelphia, PA, USA, ²University of South Carolina, Columbia, SC, USA, ³Harvard School of Public Health, Boston, MA, USA

SIG: Yes, Children and families

Awards:

Objective: This research used a multi-stage, iterative method to develop a questionnaire assessing parenting practices around preschool aged children's snacking for use in low-income populations.

Methods: A conceptual model was created by drawing upon general parenting literature and as well as that specific to feeding. In-depth interviews and card sorts were conducted with 46 low-income White, African-American, and Hispanic caregivers (95% mothers) of children 3-5 years were used to revise the model and generate items. Cognitive testing was performed. Initial psychometrics are being evaluated in a multi-state, ethnically diverse sample of > 350 low-income parents of preschoolers.

Results: The initial theory-based conceptual model included 11 uni-dimensional parenting practices reflecting 3 higher-order parenting constructs: coercive control, autonomy support, and structure. The results of the qualitative research resulted in the identification of an additional overarching construct, permissiveness and 15 multi-dimensional parenting practices. Theory was used to guide and empirical qualitative findings were used to fully characterize operational definitions for each construct. Four to six items were generated for each construct in the revised conceptual model, using wording and themes that emerged from the qualitative analysis. A total of 105 items remained following cognitive testing. Results of initial psychometrics for Parenting Around Child Snacking (PACS) Questionnaire will be presented.

Conclusions: The iterative multi-faceted approach taken resulted in a conceptual model of parenting around child snacking reflecting current theory and guided by empirical observation of parenting in low-income families.

S4.7.2

The Use of Goal Directed Feeding Behaviors among Low-income Hispanic Families with Preschoolers: Feeding Style Differences

Sheryl Hughes¹, Thomas Power², Jennifer Fisher³

¹Baylor College of Medicine, Houston, TX, USA, ²Washington State University, Pullman, WA, USA, ³Temple University, Philadelphia, PA, USA

SIG: Yes, Children and families

Awards:

Purpose: The study purpose was to examine relationships among broad measures of parental feeding (authoritarian, authoritative, indulgent, and uninvolved styles) and more goal-oriented feeding directives in a low-income sample of Hispanic families assessed by parent report and later confirmed by direct observations.

Methods: 187 Hispanic families with preschoolers were recruited from Head Start districts in a large urban city in the U.S. As part of a larger study of parenting influences on child eating, parents completed the Caregiver's Feeding Styles Questionnaire (CFSQ) and the Comprehensive Feeding Practices Questionnaire (CFPQ). The CFSQ assessed the overall attitude and emotional climate a parent creates with their child during feeding episodes. Parents were categorized into four feeding styles based on dimensions of demand/control and response/nurturance: authoritarian parents (n = 66); authoritative parents (n = 30); indulgent parents (n = 62); and uninvolved parents (n = 29). The CFPQ included 12 subscales that measure a range of goal directed feeding practices. Differences across the four feeding styles on feeding practice constructs were examined using ANOVA. Significant feeding style effects were followed up with least significant differences post hoc tests. In addition to parent-report measures of feeding, mealtime behaviors were observed between the parent and child in a mealtime setting and are currently being coded.

Results: Results showed differences across feeding style categories in six out of the twelve CFPQ factors. Authoritarian parents reported using food to regulate child emotions, using food as a reward for good behavior, and pressuring their child to eat more food at mealtimes significantly *more* often than authoritative, indulgent, and uninvolved parents ($p < 0.05$). Authoritative parents reported actively demonstrating healthy eating *more* often than uninvolved parents ($p < 0.05$). Uninvolved parents reported encouraging their children to participate in planning and meal preparation *less* often than authoritarian, authoritative and indulgent parents ($p < 0.05$). Unexpectedly, indulgent parents reported keeping track of less healthy food intake *more* often than authoritarian and uninvolved parents ($p < 0.05$).

Conclusions: Suggestions for modifying feeding practices within each feeding style category will be discussed as well as comparisons across observed and parent-reported feeding behaviors during mealtimes.

S4.7.3

What parenting practices do parents report using to get their children to be active in a sample of US & Canadian children?

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²University of Minnesota, Minneapolis, MN, USA, ³Baylor College of Medicine, Houston, TX, USA

SIG: Yes, Children and families

Awards:

Purpose: To describe which practices parents report using to get their child be more physically active and to examine the extent to which these practices are incorporated in published measures identified from systematic reviews.

Methods: Physical activity (PA) practices in the literature were identified by reviewing the content of 115 published physical activity parenting practices (PAPP) measures obtained from a current systematic review supplemented with a literature search. Items from the literature were coded at two levels, 13 primary codes and between 1-6 secondary codes. Types of PA practices used by parents were identified by surveying a stratified sample of 135 Canadian and US parents of 5-12 year old children. Parent responses were coded using the same coding scheme developed for the literature review which consisted of matching all parent practices to a primary and secondary code and a most representative new or already existing item. Data from both the literature and parents were aggregated into 6 main dimensions. A weighted logistic regression analysis (to account for the proportion of the content emphasized) was used to compare whether the literature emphasized different practices than parents self-report using with their child.

Results: From the literature, we reviewed 1027 items which were collapsed into 110 most representative items. The parent survey generated 2200 responses which linked to 95 most representative items from the literature and generated 35 new items. Parents significantly emphasized different issues than what is measured in the literature ($p < .001$). Parents emphasized more control strategies (12% vs 4%), modeling and teaching strategies (12% vs 7%), and how they structured the activity environment (30% vs 15%). Parents significantly placed less emphasis on autonomy support (13% vs 17%), talked less about logistical issues associated with facilitating their child's activity (12% vs 21%) and emphasized less responsive strategies to get child to be active (21% vs 36%).

Conclusion: Physical activity practices most often employed by parents are not the ones emphasized in current measures. The extent to which putting more emphasis on the areas identified by parents will increase the predictive validity of the measures warrants further examination.

S4.7.4

Validation of the Comprehensive General Parenting Questionnaire across the globe and associations with children's energy balance-related behavior and BMI: preliminary results

Ester Sleddens¹, Louise Mâsse², Stef Kremers¹, Teresia O'Connor³, Carel Thijs⁴, Isabelle Sioen⁴, Nathalie Michels⁴, Thomas Power⁵
¹Maastricht University, Maastricht, The Netherlands, ²University of British Columbia, Vancouver, BC, Canada, ³Baylor College of Medicine, Houston, TX, USA, ⁴Ghent University, Ghent, Belgium, ⁵Washington State University, Pullman, WA, USA

SIG: Yes, Children and families

Awards: No

Purpose: The Comprehensive General Parenting Questionnaire (CGPQ) was developed to assess the five key constructs of general parenting, including nurturance, structure, behavioral control, coercive control, and overprotection (Sleddens et al, 2014 IJBNPA). Previous studies provide evidence for the contribution of general parenting to children's dietary and physical activity habits (Sleddens et al., 2011 IJPO). The purpose of this paper is to determine the psychometric properties of the 85-item CGPQ administered in multiple countries and to assess relationships with children's energy balance-related behavior (EBRB) and BMI.

Methods: In this study, the CGPQ was completed by caregivers of 5-13 year olds (mean=9.25 years, SD=1.03) in the Netherlands (KOALA-study N=1821), Belgium (ChiBS study, N=318), and the United States (POETV study, N=212). Moreover, children's height and weight was assessed (except for the POETV study that only assessed amount of screen time) and children's food intake, physical activity and sedentary behavior. Confirmatory Factor Analyses and Item-Response Modeling techniques were used to assess the underlying parenting constructs and to further reduce items. Finally, we regressed general parenting on BMI z-scores and EBRB of the children using cluster-analytic approaches on the parenting constructs.

Results: A shorter version of the CGPQ was developed. Preliminary psychometric analyses show that the items cluster around five key constructs to define authoritative, authoritarian, permissive and indulgent forms of parenting. Only overprotection was positively related to children's BMI within the KOALA study. No associations with BMI were found within the ChiBS study. Parenting was related to children's use of screen media (but not in the ChiBS study). Nurturance and structure were negatively related to screen time, whereas coercive control was positively related. In addition, within the KOALA study, behavioral control was positively related to screen time. Within the POETV study, overprotection was positively related to screen time. Findings with other EBRBs will be presented during the conference.

Conclusions: The findings of this study will have important implications for the measurement of general parenting. The proposed questionnaire may facilitate research exploring how general parenting influences children's weight status, probably moderating on the relationship between more specific food- and activity-related parenting practices and children's EBRB.

S5.7. SYMPOSIUM:

International Children's Accelerometry Database (ICAD): overview, ongoing work and future directions.

Chair: Esther MF van Sluijs, University of Cambridge, Cambridge, UK

S5.7.1

Physical activity, sedentary behavior and childhood obesity: a quantile regression analysis.

Jonathan Mitchell¹, Marsha Dowda², Russel Pate²
¹University of Pennsylvania, Philadelphia, USA, ²University of South Carolina, Columbia, USA

SIG: No, this communication does not fit in any of the SIGs

Awards:

Objective:

We aimed to determine if moderate-to-vigorous physical activity (MVPA) and sedentary behavior (SB) were independently associated with body mass index (BMI) and waist circumference (WC) in children and adolescents. We specifically assessed if MVPA and SB were associated with changes in the shape of the BMI and WC frequency distributions.

Methods:

We analyzed cross-sectional data from the ICAD (N=10,968; 6-18y; 51% female). We calculated age and gender specific body mass index (BMI) and waist circumference (WC) z-scores using ICAD means and standard deviations, and used accelerometry to estimate MVPA (h/d, $\geq 2,296$ cpm) and total SB (h/d, <100 cpm). We applied quantile regression to analyze the data and tested for associations at the 5th, 10th, 15th, ..., 85th, 90th, and 95th percentiles. All models included age, sex, race, household income and accelerometer wear time; the final models additionally included MVPA and SB. We repeated our analyses using television-viewing data (a common leisure time SB) that were available for a subsample (N=6,608).

Results:

More time spent in MVPA was associated with lower BMI and WC z-scores, whereas more total SB was associated with higher BMI and WC z-scores. These associations were strongest at the higher percentiles of the z-score distributions. In the final model the association between MVPA and the z-scores remained, but the total SB associations were no longer present. For example, in the final model each additional hour per day of MVPA was associated with lower BMI z-scores at the 10th ($b=-0.04$, $P=0.018$), 50th ($b=-0.18$, $P=1.7 \times 10^{-12}$) and 90th percentiles ($b=-0.35$, $P=2.0 \times 10^{-11}$). More television viewing was associated with higher BMI and WC z-scores and the associations were strongest at the higher percentiles of the z-score distributions, before and after adjustment for MVPA and total SB.

Conclusions:

We observed that MVPA and television viewing were independently associated with BMI and WC in children and adolescents. Our observation of stronger associations at the higher percentiles indicates that increasing MVPA and decreasing television viewing at the population-level could shift the upper tails of the BMI and WC frequency distributions to lower values, thereby lowering the number of children and adolescents classified as obese.

S5.7.2

Daylight saving time as a potential public health intervention.

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SIG: No, this communication does not fit in any of the SIGs

Awards:**Objective:**

It has been proposed that introducing daylight saving measures could increase children's physical activity, but very little research exists on this issue. This study therefore examined associations between time of sunset and activity levels, including using the bi-annual 'changing of the clocks' as a natural experiment.

Methods:

23,188 children aged 5-16 years from 15 studies in nine countries, drawn from the International Children's Accelerometry Database. 439 of these children were of particular interest for our analyses as they contributed data both immediately before and after the clocks changed. Average, objectively-measured physical activity level (Actigraph accelerometer counts per minute) was our primary outcome. Date of accelerometer data collection was matched to time of sunset and weather characteristics. We examined associations using linear regression, with days as the units of analysis and clustered by child.

Results:

Adjusting for child and weather covariates, we found that longer evening daylight was independently associated with a small increase in daily physical activity. Consistent with a causal interpretation, the magnitude of these associations was largest in the late afternoon and early evening and these associations were also evident when comparing the same child just before and just after the clocks changed. These associations were, however, only consistently observed in the five mainland European, four English and two Australian samples (adjusted, pooled effect sizes 0.03-0.07 standard deviations per hour of additional evening daylight). In some settings there was some evidence of larger associations between daylength and physical activity in boys. There was no evidence of interactions with weight status or maternal education, and inconsistent findings for interactions with age.

Conclusions:

In Europe and Australia, evening daylight seems to play a causal role in increasing children's activity in a relatively equitable manner. Although the average increase in activity is small in absolute terms, these increases apply across all children in a population. Moreover, these small effect sizes actually compare relatively favourably with the typical effect of intensive, individual-level interventions. We therefore conclude that, by shifting the physical activity mean of the entire population, the introduction of additional daylight saving measures could yield worthwhile public health benefits.

S5.7.3

Introduction to the International Children's Accelerometry Database (ICAD) - current status and future plans.

Lauren Sherar¹, Esther van Sluijs³, Andy Atkin³, Borge Hansen⁴, Ashley Cooper², Dale Esliger¹, Angie Page², Ulf Ekelund^{3,4}

¹Loughborough University, Loughborough, UK, ²University of Bristol, Bristol, UK, ³University of Cambridge, Cambridge, UK,

⁴Norwegian School of Sport Sciences, Oslo, Norway

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: To date, a number of studies of children and adolescents across diverse cultures around the globe have collected accelerometer measures of physical activity (PA) accompanied by a broad range of predictor variables and associated health outcomes. The International Children's Accelerometry Database (ICAD) project pooled and reduced raw Actigraph accelerometer data using standardised methods to create comparable outcome variables across studies. This presentation will provide a detailed description of the evolution of the ICAD including describing contributing studies, data harmonisation methods used, policy and practice impacts of pooling objective PA data across countries, and future directions.

Methods: Between September 2008 and May 2010, 46,131 raw Actigraph (7164, 71256, GT1M) data files and accompanying anthropometric, demographic and health data collected on children (3-18 years) were obtained from 20 studies from Europe, the US, Australia and Brazil (9 cross-sectional, 6 longitudinal, 1 closed cohort, and 4 intervention). All data was reduced using standardised data harmonisation methods. The ICAD was released in 2011 as a resource open for external data requests.

Results: After data cleaning and re-processing, ~95% of the accelerometer files in ICAD have ≥1 day of valid data (using ≥8hr of wear as the criterion). Up to Oct 2014, 22 external applications to use the ICAD have been approved, and ICAD data featured in the high impact Lancet PA Series. The applications to use ICAD have varied in their use of the data, for example to: address methodological issues; examine prevalence of PA/sedentary behaviour across countries and cultural groups; examine tracking of behaviours; conduct natural experiments. To expand ICAD, further longitudinal and correlates data from existing studies will be included, and an additional 33 studies, from 15 countries, have been identified to date.

Conclusions: The ICAD has enabled a diverse number of outputs addressing a variety of evidence gaps around the epidemiology of young people's PA. The ICAD is now moving into the second wave of data pooling with the hope to partner with studies from populations and regions presently under-represented (e.g. data collected in pre-schoolers/adolescents; Africa/Asia/South America).

S5.7.4

Independent associations between TV viewing and cardio-metabolic health among children and youth.

Anna Timperio, Nicky Ridgers, David Crawford, Catherine Cash, Ester Cerin, Jo Salmon
Deakin University, Melbourne, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards:

Purpose: A previous study involving 20,871 children found no association between sedentary time and cardio-metabolic health, independent of moderate-to-vigorous physical activity (MVPA). Although many studies have examined associations between television viewing and body composition among youth, few have examined associations with cardio-metabolic risk factors. The purpose of this study was to examine associations between television viewing and cardio-metabolic risk factors among children and youth, independent of physical activity (MVPA).

Methods: Cross-sectional data collected from 7,115 children and adolescents aged 6-18 years from six studies in five countries were drawn from the International Children's Accelerometry Database. Duration of television viewing was categorised as: <1 hr/day; 1-2 hr/day; 2-4 hr/day; ≥4hr/day. Generalized Linear Models were used to examine associations between television viewing and diastolic and systolic blood pressure, LDL and HDL cholesterol, triglycerides and glucose (each dichotomised based on previously published potentially abnormal/borderline screening values), adjusting for BMI, age and sex. Study was included as a dummy variables. These analyses were repeated controlling for MVPA (mins/day). Television viewing*MVPA interactions were also examined.

Results: There were no significant associations between TV viewing and any of the six cardio-metabolic risk factors before or after adjustment for MVPA. However, there was a significant interaction between television viewing and MVPA for a level of systolic blood pressure requiring further evaluation (OR=1.17, 95%CI=1.02-1.35). Within each category of television viewing, there was a general trend towards lower odds of high systolic blood pressure with increasing MVPA (collapsed into quartiles), with the exception of the highest category of TV viewing (≥4hr/day). There were no differences in effects across the six studies.

Conclusions: In contrast to studies in adult populations, this study found little evidence of deleterious effects of television viewing on cardio-metabolic risk factors in this large and heterogeneous sample of children and adolescents. However, the results suggest that MVPA may not be sufficient to reduce risk of high blood pressure among those spending ≥4hr/day watching television.

S6.7. SYMPOSIUM:

Mapping the determinants of dietary behaviour and physical activity/sedentary behaviour in minority ethnic groups- a DEDIPAC study: potential explanations, knowledge gaps and key research challenges

Chair: Michelle Holdsworth, University of Sheffield, Sheffield, UK

S6.7.1

The determinants of dietary behaviour in minority ethnic groups-a systematic mapping review from the DEDIPAC study

Hibbah Araba Saeed¹, Mary Nicolaou², Katie Powell¹, Laura Terragni³, Lea Maes⁴, Karien Stronks², Michelle Holdsworth¹
¹University of Sheffield, Sheffield, UK, ²Academisch Medisch Centrum, Amsterdam, The Netherlands, ³National Institute for Consumer Research, Oslo, Norway, ⁴University of Ghent, Ghent, Belgium

SIG: Yes, Socioeconomic inequalities

Awards: No**Objective:**

To systematically search and retrieve quantitative and qualitative literature that identifies the factors influencing dietary behaviour among minority ethnic groups living Europe. And also to develop a systematic map to illustrate the ways in which the factors affecting diet and dietary behaviour among minority ethnic groups might be interrelated.

Methods: Electronic databases including MEDLINE, EMBASE, Web of Science, Scopus, ProQuest, and PsychINFO were searched. All electronic databases were searched from 1999 to 2014. Supplementary search methods including citation follow-up technique and expert consultation were also employed. All observational and intervention studies that used quantitative and qualitative methods to examine dietary behaviour among minority ethnic groups in Europe were included. Other studies that focused on nutrition related diseases (e.g. obesity) and included relevant data on dietary behaviour of minority ethnic groups were also included. There were no restrictions on language.

Results:

Dietary behaviour is influenced by a range of factors. These factors include socioeconomic status, income, food availability and access, religious beliefs, generation, culture, gender and country of origin.

Conclusions:

Europe has a growing population of minority ethnic groups whose dietary behaviours are of public health concern. To be able to address nutritional needs of these populations, understanding factors that influence their diet behaviours is warranted.

S6.7.2

The determinants of physical activity and sedentary behaviour in minority ethnic groups-a systematic mapping review from the DEDIPAC study

Lars Jørn Langøien¹, Laura Terragni¹, Gro Rugseth², Gun Roos¹
¹National Institute for Consumer Research, Oslo, Norway, ²The Norwegian School of Sport Sciences, Oslo, Norway

SIG: Yes, Socioeconomic inequalities

Awards:**Objective:**

The main objective of the mapping review is to systematically search and retrieve quantitative and qualitative literature that identifies the factors influencing physical activity and sedentary behaviour among minority ethnic groups living in Europe, across the life-course. Another objective is to develop a systematic map to illustrate the ways in which these factors might be interrelated. We also aim to identify the main differences in factors affecting physical activity and sedentary behaviour both between and within minority ethnic groups living in Europe, as well as gaps in the published literature relating to these topics and potential priorities for future research.

Methods:

We have searched relevant electronic databases for literature from 1999 to 2014. This time period was chosen because we anticipated that any determinants identified before 1999 would be referred to in more recent literature. Citation follow-up technique was used to identify studies that might not have been picked up through the search of the electronic databases. We have also browsed relevant journals to find more studies. All observational and intervention studies using quantitative and qualitative methods that examine physical activity and sedentary behaviour among minority ethnic groups in Europe are included. These are studies that identify an association between a risk factor and the physical activity or sedentary behaviour of such groups. Such factors might include motivation, knowledge or perceptions. Other studies that focus on physical activity and sedentary behaviour related to diseases (e.g. obesity) and include relevant data on physical activity or sedentary behaviour on minority ethnic groups are also incorporated.

Results:

The expected results of the review is identifying key determinants of physical activity and sedentary behaviour in minority ethnic groups in Europe, and how these determinants might be interrelated.

Conclusion: Europe has a growing population of minority ethnic groups whose physical activity and sedentary behaviours are of public health concern. To be able to improve physical activity and sedentary behaviour in these populations, understanding factors that influence these behaviours is warranted.

S6.7.3

Developing a framework map of the major determinants of dietary behaviour and physical activity/sedentary behaviour in minority ethnic groups living in Europe

Michelle Holdsworth¹, Mary Nicolaou², Hibbah Araba Saeed¹, Lars Jørn Langøien³, Katie Powell¹, Laura Terragni³, Pablo Monsivais⁴, Karien Stronks²

¹University of Sheffield, Sheffield, UK, ²Academisch Medisch Centrum, Amsterdam, The Netherlands, ³National Institute for Consumer Research, Oslo, Norway, ⁴University of Cambridge, Cambridge, UK

SIG: Yes, Socioeconomic inequalities

Awards:**Objective:**

To explain the process of developing a framework map of the major determinants of dietary behaviour and physical activity/sedentary behaviour in minority ethnic groups, living in Europe.

Methods:

Systematic mapping literature reviews were conducted separately for dietary behaviour and physical activity/sedentary behaviour determinants of minority ethnic groups living in the UK. These mapping reviews resulted in the production of 'evidence-based' determinants maps, which were merged together, to illustrate determinants through different life stages and at different socio-ecological levels (age, sex and constitutional factors; individual 'lifestyle'; social and community networks; socio-economic, cultural and environmental conditions). They were then subject to review from experts in the field in the DEDIPAC consortium and extended further to incorporate 'eminence' evidence from experts in migrant health and social determinants of health in this symposium.

Results:

This framework map integrates evidence from the literature and from expert review about the potential explanations, knowledge gaps and key research challenges of minority ethnic groups living in Europe.

Conclusions:

The findings from this framework will identify key modifiable determinants to guide the development of interventions which are more effective in minority ethnic groups.

S7.7. SYMPOSIUM: Innovative methodologies to study environment-health behavior relationships

Chair: Jasper Schipperijn, University, Odense, Denmark

S7.7.1

Does every step count? The use of SenseCam images, accelerometry, and GPS to investigate physical activity intensity and context.

Katie Crist¹, Jacqueline Kerr¹, Lu Wang¹, Suni Godbole¹, Marta Jankowska¹, Jasper Schipperijn²
¹University of California, San Diego, USA, ²University of Southern Denmark, Odense, Denmark

SIG: Yes, Policies and environments

Awards:

Purpose: Outdoor physical activity (PA) has been associated with higher intensity PA and improved physical and mental health. However, indoor time may be important for interventions that focus on lower intensity activities, like walking, and the accumulation of total PA. This study investigates the relationships between indoor and outdoor time and PA intensity and the odds of meeting recommended PA guidelines, using innovative, objective methods.

Methods: Adults (N=72, 21-82 years old) wore an ActiGraph accelerometer, SenseCam and GPS for 1 to 8 days. SenseCam images were annotated for indoor or outdoor location. Accelerometer counts per minute (CPM) and SenseCam image data were aggregated to the minute level and matched by time-stamp. Average daily total PA time was computed as minutes spent at >100 CPM and moderate to vigorous PA (MVPA) as minutes spent at >2020 CPM. Generalized linear mixed models were used to adjust for within person clustering and tested differences in intensity of outdoor active minutes compared to indoor active minutes, and whether those with more outdoor time were more likely to meet the MVPA guidelines. Medians were reported due to non-normal distribution of PA time.

Results: The median minutes participants spent indoors and outdoors were 507 (395, 613) and 61 (233,123), respectively. Participants spent 1% of indoor time in MVPA, as compared to 23% of outdoor time. Outdoor PA intensity was 39% higher compared to indoor PA for high-light minutes ($p < 0.001$), defined as accelerometer counts per minute (CPM) ≥ 1041 . The odds of meeting the 30 minutes/day PA recommendation doubled (OR = 2.04) for every additional hour spent outdoors, after adjusting for age, gender, BMI and wear time ($p < 0.001$).

Conclusions: Being outdoors may encourage physical activity and outdoor PA may be more likely to reach intensities that meet the PA guidelines. However, interventions that promote a message that "every step counts" may need to capture indoor walking that occurs at lower intensities. Thus, intervention messaging should account for the specific PA behavior being targeted. Additionally, if outdoor PA interventions are recommended, we must ensure the built environment is supportive of these activities.

S7.7.2

Capturing food and drink purchasing and consumption amongst young people on their journeys to and from school: can wearable cameras help?

Gill Cowburn¹, Anne Matthews¹, Aiden Doherty¹, Alexander Hamilton¹, Paul Kelly², Julianne Williams¹, Charlie Foster¹, Michael Nelson³

¹University of Oxford, Oxford, UK, ²The University of Edinburgh, Edinburgh, UK, ³Public Health Nutrition Research, London, UK

SIG: Yes, Policies and environments

Awards:

Purpose: To test the feasibility and acceptability of using wearable cameras as a method to capture and explore the opportunities for food and drink purchasing and consumption that young people encounter on their regular journeys to and from school.

Methods: Twenty two participants aged 13-15 years old were recruited from four secondary schools in two counties of England to take part in this qualitative study. Each participant wore a SenseCam and a GPS (Qstarz BT-Q1000XT) device on their journeys to and from school for four consecutive school days. Participants completed a food and drink purchase and consumption diary and took part in an individual semi-structured interview, which reviewed the images captured and explored their food and drink purchase and consumption during their journeys to and from school. Researchers also undertook an audit of food outlets located within a specified Euclidean buffer zone around each school. Image data was coded manually according to predefined criteria. Interview data was audio-recorded, transcribed verbatim and analysed using a thematic analysis approach, based on the principles of modified grounded theory.

Results: SenseCam offered a feasible and acceptable method for collecting food purchase and consumption data when used alongside traditional methods of data collection in a small number of teenagers. We found evidence of participants making deliberate choices about whether or not to purchase and consume food and drink on their journeys. These choices were influenced by priorities over money, friends, journey length, travel mode and ease of access to opportunities for purchase and consumption. Most food and drink items were purchased and/or consumed within an 800m Euclidean buffer around school with items commonly selected being high in energy, fat and sugar. Wearable camera images combined with interviews helped identify unreported items and misreporting errors.

Conclusions: Wearable camera images prompt detailed discussion and generate contextually specific information which could offer new insights and understanding around eating behaviour patterns. This study suggests a method to place exposure to food retail and actual purchasing and consumption behaviour of individuals in context, although the feasibility of scaling up the use of the method requires further empirical work.

S7.7.3

Does the effect of micro-environmental factors on the appeal for adults' transportation cycling vary across macro-environments? An experimental study.

Lieze Mertens¹, Jelle Van Cauwenberg¹, Ariane Ghekiere¹, Veerle Van Holle¹, Ilse De Bourdeaudhuij¹, Benedicte Deforche¹, Jack Nasar², Delfien Van Dyck¹
¹Ghent University, Ghent, Belgium, ²Ohio State University, Columbus, USA

SIG: Yes, Policies and environments

Awards:

Purpose: Micro-environmental factors, instead of macro-environmental factors (including walkability, access to shops/services/work, and urbanization), are easier to change in existing neighborhoods and thus more practical to target for environmental interventions. Unfortunately, relationships between transportation cycling and more changeable, micro-environmental factors are less consistent. Moreover, for interventions we need to know how well the findings can generalize to other macro-environments. This study aims to identify if the effect of micro-environmental factors (evenness of the cycle path, speed limitation and degree of separation) on the appeal for adults' transportation cycling depends on macro-environmental factors.

Methods: Purposeful convenience sampling was used to recruit 389 middle-aged adults between 45 and 65 years. Participants completed a web-based questionnaire consisting of socio-demographic characteristics and a series of choice tasks with manipulated photographs using a choice based conjoint (CBC) method. Conjoint analysis was used to analyze the data.

Results: Although several interaction effects between the micro-environmental factors and the macro-environmental factor were significant, the direction of the effects across the different macro-environments did not differ, only the magnitude of the effect. Moreover, the macro-environment was clearly less important than the micro-environmental factors regarding the appeal for transportation cycling. Our results suggest that the strength of the main effects of the micro-environmental factors are mainly independent of the macro-environment and that the ranking of the relative importance of the three micro-environmental factors is similar in each macro-environment.

Conclusions: Findings obtained from this research could inform environmental interventions in real life settings to modify similar micro-environmental factors in different macro-environments.

S7.7.4

Identifying 'hotspots' for physical activity in schoolyards

Henriette Bondo Andersen, Charlotte Skau Pawlowski, Jasper Schipperijn
 University of Southern Denmark, Odense, Denmark

SIG: Yes, Policies and environments

Awards:

Purpose: To investigate how schoolchildren use different schoolyard areas and whether these areas are associated with different types of physical activity (PA) for different subgroups. Schoolyard characteristics seem to be related to behavior during recess, but exactly which behavior takes place where and how to measure it objectively in a proper way remains unclear.

Methods: 744 students (grade 4-8), enrolled at seven Danish schools were asked to wear an accelerometer (ActiGraph GT3X) and a GPS (Qstarz BT-Q1000XT) for 5 schooldays to determine their level of PA and movement patterns in the school yard during recess periods. We will explore different methods to identify activity hotspots and test different ways of aggregating data. Different combinations and hierarchical orders of aggregation by person, by subgroup, by recess and by day will be tested. PA was measured in average counts per min in each of the 'Activity hotspots' overall and per subgroup (boys/girls, groups of high and low PA).

Results: Multi courts, lawn areas, playground areas and marked areas on the asphalt surface were identified as 'activity hotspots'. Significant differences in average counts per min, in the 'activity hotspots' were found between gender and high/low PA groups.

Conclusions: This finding emphasizes the importance of investigating the potential of the various settings and features in the schoolyard in promoting PA for different groups. However, managing combined data of GPS and accelerometer on a specific area like the schoolyard is rather complex. Analyzing individual PA and movement measured objectively every 15 second in five days, by average count per minute for different groups per recess, requires a variety of decisions to be made. This study contributes with a conceptualization of 'hotspots' in analyzing spatial physical activity using GPS and accelerometer.

S8.7. SYMPOSIUM:

Interventions to Increase Physical Activity Through Dog Walking: International Evidence

Chair: Hayley E Christian, The University of Western Australia, Perth, WA, Australia

S8.7.1

Correlates of dog walking: identifying intervention points

Carri Westgarth¹, Robert Christley¹, Hayley Christian²
¹University of Liverpool, Liverpool, UK, ²The University of Western Australia, Perth, WA, Australia

SIG: Yes, Policies and environments

Awards:

Purpose: Physical inactivity and sedentary behaviour are major threats to population health. A considerable proportion of people own dogs, and there is good evidence that dog ownership is associated with higher levels of PA. However not all owners walk their dogs regularly. This paper comprehensively reviews the evidence for correlates of dog walking so that effective interventions may be designed to increase the PA of dog owners.

Methods: Published findings from 1990-2012 in both the human and veterinary literature were collated and reviewed for evidence of factors associated with objective and self-reported measures of dog walking behaviour, or reported perceptions about dog walking. Study designs included cross-sectional observational, trials and qualitative interviews.

Results: There is good evidence that the strength of the dog-owner relationship, through a sense of obligation to walk the dog, and the perceived support and motivation a dog provides for walking, is strongly associated with increased walking. The perceived exercise requirements of the dog may also be a modifiable point for intervention. In addition, access to suitable walking areas with dog supportive features that fulfil dog needs such as off-leash exercise, and that also encourage human social interaction, may be incentivising.

Conclusions: Current evidence suggests that dog walking may be most effectively encouraged through targeting the dog-owner relationship and by providing dog-supportive physical environments. More research is required to investigate the influence of individual owner and dog factors on 'intention' to walk the dog as well as the influence of human social interaction whilst walking a dog. The effects of policy and cultural practices relating to dog ownership and walking should also be investigated. Future studies must be of a higher quality methodological design, including accounting for the effects of confounding between variables, and longitudinal designs and testing of interventions in a controlled design in order to infer causality.

S8.7.2

Overview of dog walking interventions & the Dogs PAW pilot study

Elizabeth Richards, Niwako Ogata
Purdue University, IN, USA

SIG: Yes, Policies and environments

Awards:

Purpose: 1) Overview dog walking intervention studies conducted to date and 2) describe the development and evaluation of a 3-month social cognitive theory-based, randomized controlled pilot intervention designed to increase dog walking. Dogs, Physical Activity, and Walking (Dogs PAW) intervention used email contacts to influence theoretical constructs of self-efficacy, self-regulation, outcome expectations and expectancies, and social support to promote dog walking.

Methods: Published articles (from 1990-2014) of dog walking intervention studies were reviewed. Dogs PAW intervention: Participants (n=49) were randomized into an intervention or control group. Regression models were used to: 1) examine significant differences between intervention and control groups from baseline to post-intervention and 2) examine if changes in theoretical constructs from baseline to post-intervention resulted in changes in dog walking (intervention and control groups).

Results: To date, a handful of dog walking intervention studies have been published. These interventions include a range of complexity and duration, with limited use of health behavior theory and follow-up. Dog walking intervention studies have shown mixed effects for increases in physical activity. In the Dogs PAW intervention all participants at baseline walked their dog <10mins/week. Post-intervention, the control group increased dog walking to 19.4±4.9 mins/week while the intervention group increased weekly minutes of dog walking to 79.3±11.2 (p<0.01). In the intervention group, social support provided by the dog significantly increased from baseline to post-intervention. In the linear regression model, changes in theoretical constructs in the control group did not significantly impact changes in weekly minutes of dog walking. However, in the intervention group, changes in both family social support ($\beta=24.9\pm9.9$; p=0.02) and self-efficacy: resisting relapse ($\beta=27.1\pm9.5$; p<0.01) significantly positively impacted changes in weekly minutes of dog walking.

Discussion: Results of the Dogs PAW intervention suggest that increasing self-efficacy for dog walking by fostering social support and providing education on the benefits of dog walking for both the owner and the dog can promote increases in dog walking which can ultimately result in increased overall PA. Future dog walking intervention studies would benefit from inclusion of a health behavior theory, longer follow-up, and mediation testing.

S8.7.3

Parks, pooches and policy: Insights for promoting dog-walking from a quasi-experiment

Melanie Rock¹, Gavin McCormack¹, Taryn Graham¹, Ann Toohey¹, Dawn Rault², Kenda Swanson¹, Lindsay Burton¹, Alessandro Massolo¹

¹University of Calgary, AB, Canada, ²Mount Royal University, AB, Canada

SIG: Yes, Policies and environments

Awards:

Purpose: 1) Highlight policy as influential on dog-walking; and 2) Present a study designed to assess the influence of municipal policies on dog-walking.

Methods: Pre/post comparisons in four intervention and five control parks were made to assess the influence of on-leash and off-leash policies on dog-walking. In this municipality, dogs are supposed to be on-leash whenever in public space, except in designated off-leash areas. 'Intervention' parks were sites where the municipality proposed creating off-leash areas under a new policy, which required public consultation. 'Control' parks contained off-leash areas that had been established under the previous policy. The design combined quantitative (systematic observations, intercept questionnaires) with qualitative (participant-observations analyzed via photography, captioning, field-notes and debriefing; interviews; document analysis) methods.

Results: In 'control' parks, systematic observation confirmed frequent dog-walking. In 'intervention' parks, differing patterns of dog-walking at baseline were suggested by systematic observation, participant-observation and questionnaire data. Varied off-leash activity was observed at baseline in three 'intervention' parks. In the fourth 'intervention' park, observed dog-walking occurred on-leash. Quantitative and qualitative evidence indicated that these patterns reflected both socio-demographic neighbourhood characteristics and park-specific characteristics. According to questionnaire data, interactions amongst dog-walkers varied across 'intervention' parks, but dog-care norms did not. During public consultations on 'intervention' parks, dog-owners endorsed the proposed off-leash areas. Across sites, dog-owners met with varying degrees of opposition, reflecting park-specific characteristics and neighbourhood residents' socio-demographic characteristics. Consequently, official designation of sites as off-leash areas ultimately occurred in only two of the four 'intervention' parks. In these parks, dog-walking increased. Of the four 'intervention' parks, dog-walking frequency and off-leash activity remained highest in a park where public consultation led City officials to reject the proposed off-leash re-designation.

Discussion: By providing destinations for dog-walking, municipal policies legitimizing off-leash areas can augment physical activity within parks and surrounding neighbourhoods. The design and management of off-leash areas can facilitate physical activity amongst dog-walkers, and priority-setting could be assisted by public consultation and community participation. Nevertheless, off-leash as well as on-leash policies can be controversial. To increase physical activity and improve overall well-being through dog-walking, resistance to both off-leash and on-leash policies must be understood.

S8.7.4

Dog walking intervention research: Where to now?

Ryan Rhodes, Clarise Lim
University of Victoria, BC, Canada

SIG: Yes, Policies and environments

Awards:

Purpose: Evidence supports a reliable link between dog ownership and regular walking with the sense of obligation/responsibility from ownership as a critical correlate. While asking people to own dogs does not appear a sensible intervention given the incumbent cost and care responsibilities, the promotion of walking among owners who do not walk their dogs and the utilization of "loaner" dogs may hold utility in the promotion of both human and canine health. The aims are to 1) present a trial protocol using the multi-process action control framework to promote dog walking in Greater Victoria, Canada; and 2) provide recommendations for future dog walking intervention research.

Methods: 1) An online survey of 215 adult dog owners was used to create the trial protocol intervention material. 2) Methodological issues, challenges, opportunities and implications for future dog walking intervention research were reviewed and summarized.

Results: 1) Pilot findings were supportive that walking can be increased generally, yet the effectiveness of the intervention materials, in comparison to control groups, has not been well-established. Survey results of dog owners in Western Canada showed enjoyment, habit and dog ownership identity were the critical predictors of translating dog walking intentions into action. 2) Recommendations for future dog walking intervention research include objective measurement of dog and owner physical activity and spatial behavior patterns, longer follow up post intervention, measurement of the cost-effectiveness of interventions, investigation of behavior maintenance strategies, understanding the interplay between dog walking behavior and dog characteristics (e.g., breed), the social and policy environment, and examination of the mental and social health benefits associated with increased dog walking.

Discussion: Research conducted to date illustrates the feasibility of dog walking interventions, yet there is considerable need and opportunity for research to help with defining a best practice approach. Our current protocol, using the multi-process action control approach examines whether strategies to increase the enjoyability of walks (environmental planning), as well as habit (anchored cues and consistency of practice) and identity (sacrifice and investment) formation can aid in the promotion of regular dog walking. This best practice approach will help guide future dog walking intervention research.

S9.7. SYMPOSIUM:**Gestational weight gain and obesity. What do women want, what do health professionals think and what interventions are practical?**

Chair: Clare E Collins, The University of Newcastle, Callaghan, NSW, Australia

S9.7.1**Prevention and management of excessive gestational weight gain: a survey of overweight and obese pregnant women**

Catherine Hankey, Wilma Leslie
University of Glasgow, Glasgow, Scotland, UK

SIG: Yes, Children and families

Awards:

Purpose: Excessive gestational weight gain is associated with adverse infant, childhood and maternal outcomes and research to develop interventions to address this issue is ongoing. The views of women on gestational weight gain and the resources they would consider helpful in addressing this are however largely unknown. This survey aimed to determine the views of newly pregnant women, living in areas of social disadvantage, on 1) their current body weight and potential gestational weight gain and 2) the resources or interventions they would consider helpful in preventing excessive gestational weight gain.

Methods: A convenience sample of overweight and obese pregnant women living in Fife, UK, were invited to complete a short semi-structured questionnaire at their 12 week booking visit.

Results: 428 women, BMI > 25 kg/m², completed the questionnaire. Fifty-four per cent of respondents were obese (231) and 62% were living in areas of mild to moderate deprivation. Over three-quarters of participants felt dissatisfied with their current weight (81%). The majority of women (60%) expressed some concern about potential weight gain. Thirty-nine percent were unconcerned about weight gain during their pregnancy, including 34 women (19%) who reported having retained weight gained in earlier pregnancies. Amongst those concerned about weight gain advice on physical activity (41%) and access to sports/leisure facilities were favoured resources (36%). Fewer women (12%) felt that group sessions on healthy eating or attending a clinic for individualised advice (14%) would be helpful. "Getting time off work" was the most frequently cited barrier (48%) to uptake of resources.

Conclusions: These data suggest a lack of knowledge amongst women regarding the health risks of excessive weight gain and highlights the need to formally integrate discussions on weight gain, and its management, into routine antenatal care. Barriers to the uptake of resource to address weight gain are numerous and must also be considered in the design of future interventions and services.

S9.7.2**Health Professional's barriers to maternal obesity and weight management guideline implementation: A meta-synthesis to inform intervention development**

Nicola Heslehurst
Institute of Health & Society, Newcastle University, Newcastle upon Tyne, England, UK

SIG: Yes, Children and families

Awards:

Purpose: Maternal obesity and weight management guidelines have been published internationally. However passive dissemination of guidelines is not an effective implementation method. Active strategies are required for health professional behaviour change. Implementation strategies should be theory-based. The theoretical domains framework (TDF) is a framework of domains (e.g. knowledge) developed using constructs from existing behaviour change theories. This mixed methods systematic review aimed to identify barriers to health professionals' maternal obesity and weight management practice using a novel approach to evidence-synthesis.

Methods: The literature search included electronic databases, citation searching, and contacting experts in the field. Two researchers independently screened all identified studies (98% agreement) and carried out data extraction, quality assessment, and evidence-synthesis. Qualitative or survey studies exploring health professionals' perspectives of maternal obesity or weight management practice (their behaviour) were included. Evidence-synthesis identified barriers and facilitators to their behaviours using a 3-stage approach: 1) framework analysis using the TDF domains; 2) frequency analysis of coding across TDF domains; 3) thematic synthesis within the TDF domains.

Results: Twenty five qualitative (n=14) and survey (n=11) studies were included that focussed on maternal obesity (n=10), weight management (n=9), or both (n=6). Domains most frequently identified included knowledge and beliefs about consequences. Thematic synthesis identified complex relationships between domains. Key barriers included health professionals' beliefs that pregnant women would react negatively when discussing their weight; and a lack of health professional knowledge, behaviour change skills and confidence to provide weight management support. There were no differences in perspectives between type or international setting of health professional.

Conclusions: There are complex barriers to health professionals' implementation of maternal obesity and weight management guidelines. This review has informed the development of an intervention to support health professionals' behaviour change, and to facilitate guideline implementation among community midwives. Intervention development followed a systematic process of mapping the evidence to theory, and theory to behaviour change techniques for inclusion in the intervention. The intervention will be piloted as a cluster-RCT.

S9.7.3

Challenges influencing weight management among post-partum women: insights to support program designMegan Rollo, Melinda Hutchesson*PRC in Physical Activity and Nutrition, The University of Newcastle, Callaghan, NSW, Australia***SIG:** Yes, Children and families**Awards:** No

Purpose: Retention of excess weight gained during pregnancy is associated with long-term obesity and an increased risk of chronic disease. This study aimed to explore the weight management needs of post-partum women and determine the factors that affect weight control in the years following childbirth.

Methods: Women aged 18-40 years living in Australia and who had given birth in the past 5 years completed an online survey between May and August 2013. Participants were recruited through a variety of strategies including social media, website posts and direct email. Questions included weight, pregnancy and breastfeeding history, and dietary and physical activity behaviours. Perceived healthy eating and physical activity factors influencing weight management were assessed across 20 items, with sub-group analysis performed using Chi-squared tests.

Results: 879 women (32.9 ± 4.5 years, BMI prior to most recent pregnancy 25.6 ± 5.7 kg/m², 1.9 ± 1.0 children) completed the survey. The most commonly perceived challenges influencing healthy eating for weight management were time to prepare or eat healthy foods due to family commitments (79.4%), the ability to buy inexpensive healthy foods (72.1%) and enjoyment of healthy eating (65.9%). For physical activity, post-partum women reported time constraints due to family (86.4%), and motivation for and enjoyment of physical activity (76.8% and 69.6%; respectively) as the major factors influencing weight control. Women with a trade certificate/apprenticeship or below, more commonly perceived possessing healthy eating and physical activity knowledge and skills as challenges compared to those with a higher university degree. Education level was also an influential factor relating to healthy food access and having the support of friends to be physically active. The impact of family commitments on time to exercise was significantly more influential for older women and those with ≥ 3 children, whereas support from friends was more important for obese women compared to those overweight or of a healthy weight.

Conclusions: These findings offer insights into the perceived challenges affecting weight control in post-partum women. Weight management programs for this group should aim to address their specific needs, while further tailoring may be necessary to overcome those factors of greater significance to certain sub-groups of post-partum women.

Oral Sessions

O1.1. ORAL: Weight control interventions in adults

O1.1.1

Are weight loss interventions delivered using eHealth technologies effective? A systematic review with meta-analysis

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose: This systematic review of randomized controlled trials (RCT) aimed to determine the effectiveness of eHealth interventions for weight loss in adults.

Methods: Eight electronic databases were searched for RCTs published in English from 1995 to September 2014. Participants were adults aged ≥ 18 years. Weight loss interventions delivered using eHealth technologies compared to: a control group; another delivery mode (e.g. face-to-face); or another eHealth intervention were eligible. Studies must have reported a weight-related primary outcome. Two authors independently screened abstracts and full-text articles for inclusion. One reviewer extracted data from included studies, which was checked by a second reviewer. Meta-analysis was performed if weight (kg) results were available as change scores or final values, participant numbers were recorded, and interventions and comparators were similar enough for comparison

Results/findings: 65 RCTs met inclusion criteria, with a total of 19,234 participants (Mean 291, Range 20-2862). Intervention duration ranged from 6 weeks to 2 years (Mean 30.1 weeks), with retention rates ranging from 16%-98% (Mean 77%). Of 147 intervention arms across included studies, 116 included an eHealth component, of which 43 were delivered solely using eHealth, and 44 included more than one type of technology. The primary eHealth technologies used were websites (n=93), email (n=33), monitoring devices (e.g. accelerometers n=12), text messages (n=9) and mobile applications (n=6). Meta-analyses demonstrated significantly greater weight loss (kg) in eHealth interventions compared to control (MD -2.70 [-3.33, -2.08], $p < 0.001$, n=11) or minimal interventions (MD -1.40 [-1.98, -0.82], $p < 0.0001$, n=16). Meta-analyses also demonstrated significantly greater weight loss (kg) in eHealth interventions with extra features/components or technologies (MD 1.46 [0.80, 2.13], $p < 0.001$, n=12) compared to standard eHealth programs.

Conclusions: eHealth interventions have demonstrated potential as a treatment option for obesity, as they achieve superior weight loss at post intervention compared to no or minimal treatment. There is currently insufficient evidence to determine if eHealth interventions are as effective as traditional treatments mediums (e.g. face-to-face or telephone interventions). eHealth weight loss interventions with evidence-based behavioral strategies appear to achieve significantly greater weight loss. Further investigation is required to determine what intervention components and types of technologies are most efficacious for weight loss.

O1.1.2

Results of a two-year social and mobile weight-loss intervention for overweight and obese young adults: Project SMART

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose: Relatively few weight-loss interventions are evaluated for longer than a year, and even fewer employ mobile and social technologies commonly used among young adults. We assessed the effectiveness of a two-year intervention designed to reduce weight by improving weight-related behaviors. The intervention was theory-based and delivered via integrated user-experiences with 1) Facebook, 2) mobile apps, 3) text messages, 4) emails, 5) a website, and 6) ad hoc contact with a health coach.

Methods: 404 overweight or obese college students (aged 18 to 35 years) from three universities in San Diego, CA were randomized to receive either the intervention (n=202) or access to a website containing general health information (control group, n=202). The primary outcome was objectively measured weight at 24 months, and differences between groups were evaluated using linear mixed-effects regression.

Results: The mean (SD) age of participants was 22.7 (3.8) years; most were female (70%); and many had diverse racial or ethnic backgrounds (42% white and 31% Hispanic). Mean (SD) BMI was 29.0 (2.8) kg/m², waist circumference was 87.8 (8.9) cm, and systolic blood pressure was 115.3 (10.9) mm Hg. At 24 months, weight was assessed in 341 (84%) participants. Weight, adjusted for sex, ethnicity, and university, was significantly less in the intervention group compared to the control group at 6 months (-1.33 kg, $p = 0.011$) and 12 months (-1.33 kg, $p = 0.008$). However, differences in adjusted mean weight between groups at 18 months (-0.67 kg, $p = 0.200$) and 24 months (-0.79 kg, $p = 0.204$) were not significant. Additional outcomes have been analyzed and will be reported.

Conclusions: Social and mobile technologies may facilitate limited short-term weight loss among young adults, but as utilized in this intervention, these approaches did not produce sustained weight changes. Nonetheless, the intervention was not geographically constrained and could feasibly be disseminated to large numbers of individuals. Thus, if the reductions in weight observed in this trial could be replicated in other social and mobile interventions that improve engagement and retention, there is promise that they could translate into a meaningful population-level effect on weight status among young adults.

O1.1.3

Efficacy of TXT2BFiT, a mobile phone-based healthy lifestyle program for preventing unhealthy weight gain in young adults: 3-month outcomes of a randomised controlled trial

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Purpose

Weight gained in young adulthood often persists and accumulates throughout adulthood with associated chronic disease risk. Many current population prevention strategies are not specifically designed or appropriately tailored for young adults. TXT2BFiT is a 9-month two-arm parallel-group randomised controlled trial aimed at improving weight management and weight-related dietary and physical activity behaviours among young adults.

Methods

In the first three-month intensive phase (i.e. weeks 1 to 12) of the trial the intervention arm received eight short message service (SMS) messages per week tailored to their baseline stage-of-change, one email per week, five personalized coaching calls, diet booklet and access to website and Smartphone applications. Control participants received four SMS text messages and printed national dietary and physical activity guidelines. In-person measured body weight (kg) and height (cm) was collected at baseline. Online surveys were conducted at baseline and 12-weeks collecting self-reported body weight (kg). An invitation for an in-person body weight was offered to all participants at 12-weeks. Body weight (kg) at three months was compared between the two groups using analysis of covariance adjusting for baseline weight. Intention-to-treat principle using multiple imputations was used to account for missing data.

Results

In total, 250 participants were randomised (n=125 intervention, n=125 control). At 12-weeks, 4% (n=10) had dropped out (4% intervention vs. 0% control). Of the remaining 240, 10.8% did not complete survey measures at 12-weeks (4.3% intervention versus 16.8% control). Participants in the intervention group were 1.5kg (95% CI 0.5 to 2.5) lighter at 12-weeks than the control group after adjusting for baseline weight (P=0.004) using in-person measured body weight (kg) with imputations. There were no significant differences in participant characteristics between those attending or not attending in-person body weights.

Conclusions

The TXT2BFiT intervention was successful in preventing weight gain and inducing modest weight loss in a cohort of overweight young adults. Further investigation is required into the potential mediators of this effect. The short-term success of this low intensive m-health intervention shows potential for translation into a community-based program for young adults.

O1.1.4

A multi-media intervention to reduce diabetes risk through changes in PA and dietary habits

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SIG: Yes, e- & mHealth

Awards: No

Purpose: To develop and clinically test an automated internet-delivered intervention, Alive-PD, to improve physical activity and eating habits, weight, and glycemic markers in a pre-diabetic population.

Methods: Alive-PD is a one-year, tailored, multimedia email/web/smartphone program designed to be completely automated to permit wide scalability. The core behavioral principles are those of learning theory, aiming at incremental adoption of new behaviors until they become habitual. Weekly individualized goal-setting and progress tracking are fundamental. Tailoring centers on current consumption of specific foods, a detailed PA measure, gender, ethnicity, cooking habits, attitudes toward weight loss, and reported problems with sleep, stress and cravings. Additionally, individuals continually design and redesign their own path to progress. Motivational support is designed to encompass individual differences and variations over time through a broad menu of supportive interactions and materials. They embody principles from the Health Belief Model, Cognitive Behavior Therapy, and Positive Psychology. Internet engagement methods include gamification, small monetary incentives, and various means of social support and networking.

The program is being tested in a randomized controlled trial. Primary outcomes are clinic-assessed change in HbA1c, fasting glucose and weight. PA and eating habits are assessed with pre- and post-intervention online questionnaires. Among the 340 randomized pre-diabetic participants, mean (SD) age is 55 (8.9) years; BMI 31.1 (4.3); 68.5% are male and 60% are white. Mean fasting glucose was 109.9 (8.4) mg/dL, mean HbA1c was 5.6 (0.3)%. Intervention-control differences in glycemic measures and weight are analyzed by intention-to-treat at three and six months.

Results: After the three-month time point, changes (mean, 95% CI and p-value for treatment effect) were as follows for Intervention and Control respectively: Fasting Glucose: -4.02 (-5.29, -2.75) vs. -0.58 (-1.75, 0.59) mg/dL, p<0.001; HbA1c: -0.14 (-0.17, -0.11)% vs. -0.07 (-0.10, -0.04)%, p=0.001; Body weight: -4.40 (-5.31, -3.49) vs. -0.92 (-1.56, -0.29) lbs, p<0.001. Six-month results, incomplete at this time, will be reported, as well as diet and PA changes, not yet analyzed.

Conclusions: This fully-automated, readily-scalable program is effective in inducing medically and statistically significant changes in glycemic markers and weight, and is readily configurable for other medical conditions and populations.

O1.1.5

Effects of an mHealth cardiac rehabilitation intervention on adherence to lifestyle behaviours: a randomised controlled trial

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SIG: Yes, e- & mHealth

Awards: No

Objective:

The use of mobile technology to deliver behaviour change interventions (mHealth) to combat coronary heart disease (CHD) is gaining momentum. Previous studies have focused on single behaviours, yet traditional self-management for CHD, known as cardiac rehabilitation (CR), addresses multiple risk factors. The aim of this study was to investigate the effectiveness of an mHealth delivered comprehensive CR program to improve adherence to recommended lifestyle behaviours (smoking cessation, physical activity, healthy diet, and non-harmful alcohol intake).

Methods

A two-arm parallel, randomised controlled trial was conducted in New Zealand adults diagnosed with CHD. Both groups were offered usual care, which involved encouragement to attend CR. The intervention group also received a 24-week mHealth program, sent by daily text message and a supporting website, framed in social cognitive theory and the common sense model. The primary outcome was adherence to lifestyle behaviour, measured using a self-reported composite health behaviour score (≥ 3) at 12 and 24 weeks. Secondary outcomes included clinical outcomes, medication adherence score, self-efficacy, illness perceptions, hospital anxiety and depression.

Results

Participants (N=123) were recruited in hospital and randomised to the intervention (n=61) or the control (n=62). Participants were predominantly male (100/123; 81%), New Zealand European (73/123; 59%), with a mean age of 59.5 ± 11.1 . A significant treatment effect in favour of the intervention was observed on the primary outcome at 12 weeks (adjusted OR=2.55, 95% CI 1.12-5.84; $p=0.03$), but not at 24 weeks (aOR=1.93, 95% CI 0.83-4.53; $p=0.13$). The intervention group also reported a significantly greater medication adherence score at 24 weeks (mean difference: -0.64, 95% CI -1.0 to -0.19; $p=0.006$). No differences were seen in the clinical or psychological outcomes.

Conclusions

An mHealth delivered comprehensive CR intervention significantly improved adherence to recommended lifestyle behaviours at 12 weeks, and medication adherence at 24 weeks. MHealth programs may see greater results in the initial period, when the intervention is novel, with the effects leveling off in the maintenance phase. Additional research should examine how to motivate those who did not make any lifestyle changes over the intervention period.

O2.1. ORAL:

Dietary intervention in families

O2.1.1

Autonomous and controlled motivation: longitudinal effects on diet quality in youth with type 1 diabetes and their parents in a behavioral nutrition intervention trial

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Self-determination theory posits that the initiation and maintenance of health behavior are facilitated by motivation arising from internal versus external sources. The purpose of this study was to examine associations of autonomous motivation (AM) and controlled motivation (CM) for healthful eating with parent and child dietary intake in the context of a behavioral intervention among youth with type 1 diabetes and their parents that demonstrated a positive effect on youth diet quality. The intervention incorporated motivational interviewing and applied problem solving to increase intake of whole plant foods (fruit, vegetables, whole grains, legumes, nuts, and seeds).

Methods: Parent-youth dyads (N=136, youth age=12.3 \pm 2.5 years, youth A1c=8.1 \pm 1.1%) completed self-report measures of AM and CM every 6 months across the 18-month study. Youth and parents completed three-day food records every 3 and 6 months, respectively, from which Healthy Eating Index-2005 (HEI) and whole plant food density (WPF, sum of cup/oz equivalents per 1000 kcal of intervention target food groups) were calculated. Random effects models examined treatment group differences in AM and CM across the study duration, and investigated the longitudinal association of AM and CM with youth and parent diet quality, controlling for treatment assignment and income, and in youth models, age and sex.

Results: There was no intervention effect on AM or CM for youth or parents. Among parents, higher AM was associated with higher HEI ($p=.03$) and WPF ($p=.001$); CM was not associated with either diet quality indicator. These associations were not moderated by intervention status. Among youth, neither AM nor CM were associated with HEI or WPF. Associations were not moderated by age; however, a significant interaction of treatment assignment with CM on WPF was observed ($p=.03$), whereby CM was positively associated with WPF for youth in the control group only.

Conclusions: Findings support the role of AM as a determinant of diet quality in adults. Null findings of AM with diet quality in youth, and the positive association of CM with WPF in control youth, suggest potential differences in psychosocial correlates of dietary intake in parents versus children that should be considered when developing family-based dietary behavior interventions.

02.1.2

Measuring family meals: Does it matter how the question is asked?

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective: Family meal frequency has been consistently and significantly associated with a variety of positive outcomes for youth, including better dietary intake. Yet, family meal frequency measurement has varied widely and how this variation impacts relationships with outcomes of interest is unknown. In addition, given these positive associations, clinicians and researchers are beginning to ask family meal frequency questions more often, but it is unclear if it matters which question is asked, which question(s) should be recommended and who should answer these questions (e.g., parent or child). Therefore, the present study, informed by classical test theory, will evaluate how five parent-reported and four child-reported family meal frequency variables associate with a variety of outcomes. Findings will guide measurement recommendations for researchers and clinicians.

Method: The present cross-sectional study used parent (n=160) and child (n=160) data from the HOME Plus trial. Spearman and Pearson correlations and general linear models were used to assess bivariate associations between family meal frequency variables and associations between family meal frequency variables and common family meal research outcomes (i.e., parent and child body mass index (BMI), fruit, vegetable and sugar-sweetened beverage intake, overall dietary quality, positive meal conversations, problem solving skills, and family connectedness).

Results: All parent family meal frequency variables were significantly correlated ($r=0.61-0.94$; $p<0.001$), as were child family meal frequency variables ($r=0.36-0.84$; $p<0.001$). Most parent and child family meal variables were significantly correlated with each other ($r=0.22-0.41$, $p\leq 0.01$) and were significantly associated with children's BMI-z scores, fruit and vegetable intake, overall dietary quality, positive meal conversations and family connectedness. A psychometrically-sound scale including four items appeared most highly associated with important outcomes.

Conclusions: Parent and child reports of family meal frequency are significantly correlated but relatively low in magnitude, indicating they capture somewhat different information. Despite this, regardless of how questions were asked, most family meal frequency variables were significantly associated with important child dietary and psychosocial outcomes, suggesting it may not matter how the question is phrased. However, for future research, a summative measure of several individual items measuring family meal frequency may be most robust with weight-related outcomes.

02.1.3

Effectiveness of school-based nutrition programme Taste Lessons with and without experience-oriented activities on children's determinants of behaviour towards vegetable consumption: a quasi-experimental study

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Background

Literature suggest that school-based nutrition education programmes using experiential learning methods, including hands-on activities regarding various steps from production to preparation of food, are promising to enhance healthy eating behaviour in children. Studies on effectiveness of nutrition lessons in combination with experience-oriented activities are, however, scarce. This study aimed to compare effectiveness of the Dutch programme 'Taste Lessons' with and without additional experience-oriented activities on children's determinants of behaviour towards tasting unfamiliar vegetables, eating the recommended amount of vegetables and paying attention to the production of vegetables.

Methods

In a quasi-experimental design, data on the outcome variables were collected from 48 classes (800 children, 8-11 years old) in grades 6-7 of 34 elementary schools at baseline and after the intervention in two intervention groups: Taste Lessons Vegetable Menu (TLVM) and Taste Lessons (TL) group, and a control group. At both time points, children completed a questionnaire in which knowledge, awareness, self-efficacy, attitude, subjective norm and intention were assessed. Multilevel regression analyses were conducted to compare individual changes in the determinants in the TLVM group with those in the TL group, and in the two intervention groups with those in the control group. Effect sizes (ES) were expressed as Cohen's D.

Results

Children in the TLVM group showed a significantly higher increase in knowledge ($ES=0.51$, $P<0.001$), attitude ($ES=0.17$, $P<0.05$) and subjective norm of the teacher ($ES=0.22$, $P<0.05$) compared to the control group, whereas children in the TL group showed a significantly higher increase in knowledge ($ES=0.36$, $P<0.001$) and a borderline higher significant increase in attitude ($ES=0.16$, $P<0.10$) and intention ($ES=0.17$, $P<0.10$). Increase in knowledge ($ES=0.15$, $P<0.10$) and subjective norm of the teacher ($ES=0.16$, $P<0.10$) in the TLVM group was borderline significantly higher compared to the TL group.

Conclusions

Taste Lessons in combination with additional hands-on activities was a little more effective in increasing several determinants of behaviour than Taste Lessons without additional activities.

02.1.4

Concordance of parent and youth diet quality in families of youth with type 1 diabetes participating in a dietary intervention

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: To examine associations of parent-child dietary quality in families of youth with type 1 diabetes participating in an 18-month randomized controlled intervention trial targeting intake of whole plant foods, and to investigate effect modification by treatment assignment and family eating habits.

Methods: Parent-youth dyads (N=136, child age=12.3±2.5y, youth A1c=8.1±1.1%) completed 3-day food records every 3 (youth) or 6 (parents) months, from which Healthy Eating Index-2005 (HEI, reflecting adherence to US dietary guidelines), nutrient rich foods 9.3 score (NRF, reflecting nutrient density), whole plant food density (WPF, reflecting target foods intake), variety, glycemic index (GI), and macronutrient distribution (%energy from fat, carbohydrates, protein) were calculated. Child insulin regimen and physical activity, race/ethnicity, household income, and parent education were ascertained. Every 6 months, parents reported past-week family eating habits including frequency (days/week) of consuming home-prepared meals at home, pre-prepared meals at home, fast food, other restaurant food, meals at others' houses, family meals (with all/most household members), and family meals while watching television. Linear generalized estimating equations predicting time-varying youth intake estimated associations with time-varying parent intake, adjusting for covariates. Main effects of time-varying family eating habits were examined; separate models examined effect modification of parent intake by treatment assignment and family eating habits.

Results: All time-varying parent and child diet quality indicators were positively associated (p<0.01). Home-prepared meal frequency was associated with higher child HEI and WPF (p<0.05); more frequent restaurant food was associated with higher child HEI and %protein (p<0.001). More frequent meals w/television was associated positively with GI and %fat, and inversely with other diet indicators (p<0.05) except %carbohydrate. Family eating habits did not modify associations of parent-child intake. There was no effect modification of the association of parent and child intake by treatment group, except that the association of parent and child WPF was stronger in the intervention group.

Conclusions: Parent and youth diet quality over 18 months is strongly related in families of youth with type 1 diabetes. Watching television during family meals was consistently associated with poorer youth diet quality. Findings support the importance of addressing family diet patterns in interventions targeting youth diet quality.

02.1.5

Can families eat better without spending more: evaluation of diet cost in an intervention study among youth with type 1 diabetes and their parents

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SIG: Yes, Children and families

Awards: No

Objective: Although cost is an often-cited barrier to healthful eating, limited prospective data exist. This study examined diet cost and its association with diet quality in youth with type 1 diabetes and their parents participating in an 18-month randomized trial of a clinic-based dietary behavior intervention that demonstrated a positive effect on youth diet quality.

Methods: Parent-youth dyads (N=136, child age=12.3±2.5 years, youth A1c=8.1±1.1%) completed 3-day food records every 3 (youth) or 6 (parent) months for 18 months, from which Healthy Eating Index-2005 (HEI, measures conformance to US dietary guidelines) and whole plant food density (WPF, sum of cup/oz equivalents per 1000 kcal of intervention target food groups) were calculated. Food prices used for calculating parent and youth daily diet cost (US \$/day) were gathered from two local online supermarkets. Treatment group differences in youth diet cost at each time point were compared using t-tests. Random effects models estimated treatment group differences in diet cost across the study duration. Separate models estimated associations of time-varying youth and parent diet quality indicators and diet cost, controlling for youth age, height, weight, sex, physical activity, income, parent education, race, and treatment assignment.

Results: At baseline, mean±SE daily diet cost for youth and parents was \$5.48±0.15 and \$9.91±0.55, respectively; respective youth and parent diet quality indicators were HEI=57.3±1.3; WPF=1.89±0.09 and HEI=60.9±1.4; WPF=2.35±0.11. There were no differences between treatment groups in youth diet cost at any time point cross-sectionally or longitudinally. Further, time-varying youth HEI and WPF were not significantly associated with time-varying diet cost in longitudinal models. Among parents, time-varying WPF was inversely associated with time-varying diet cost (p=.009); each additional cup/oz equivalent of whole plant foods was associated with \$0.78 lower mean daily diet cost. An inverse association of time-varying parent HEI with time-varying diet cost approached statistical significance (p=.08).

Conclusions: The improvement in diet quality observed among youth with type 1 diabetes was achieved within families' established spending patterns. Further, findings indicate that daily diet cost varied little across a wide range of diet quality. Taken together, findings suggest that cost need not be a barrier to improving dietary intake.

O3.1. ORAL: Physical activity and sedentary behavior in toddlers

O3.1.1

A Cross-Sectional Exploration of the Prevalence and Influences of Preschoolers' Sedentary Behaviors in Early Learning Environments

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SIG: Yes, Early care and education

Awards: No

Purpose:

The purpose of this study was two-fold: (1) to compare sedentary time of preschoolers in three different early learning environments in Canada (i.e., full-day kindergarten [FDK], center-, and home-based childcare); and, (2) to assess which characteristics (e.g., staff behaviors, sedentary environment, sedentary opportunities, fixed, and portable play equipment) within these settings impact preschoolers' sedentary activities. This is the first exploration of differences in sedentary time among preschoolers in different early learning arrangements.

Methods:

Twenty-eight early learning environments participated in this cross-sectional study. Actical™ accelerometers were used to objectively measure preschoolers' (n = 218) sedentary time during early learning hours (15 second epoch). The sedentary characteristics of participating early learning classrooms were assessed using the Environment and Policy Assessment and Observation (EPAO) tool. A linear mixed model ANCOVA was conducted to determine the differences in sedentary time based on type of early learning environment. To describe the relationships between sedentary time and the sedentary-specific EPAO subscales, direct entry regression analyses were performed.

Results/findings:

Preschoolers attending centre-based childcare engaged in the highest rate of sedentary time (41.62 mins/hr, SD = 3.78) compared to preschoolers in FDK (39.68 mins/hr, SD = 3.43) and home-based childcare (40.72 mins/hr, SD = 6.34). The models for FDK, center-based childcare, and home-based childcare, comprised each of the five EPAO subscales (i.e., sedentary environment, sedentary opportunities, staff behaviors, portable play equipment, and fixed play equipment), accounted for 10.5%, 5.9%, and 40.78% of the variability in sedentary time, respectively. Only the models for home-based childcare and FDK were found to be statistically significant ($p < .05$).

Conclusions:

Results of this study suggest that preschoolers are spending a substantial portion of their day in sedentary pursuits while attending early learning programs. As a means of minimizing sedentary time among this group, particular attention should be paid to modifying the characteristics identified in this research as most influential with regard to preschoolers' sedentary behaviors in early learning settings.

O3.1.2

Evaluating two models depicting the relationships between physical activity, gross motor skills, perceived athletic competence, fitness and weight status in preschoolers

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SIG: Yes, Early care and education

Awards: No

Purpose: The Food Friends Get Movin' with Mighty Moves is a preschool-based, 18-week physical activity (PA) intervention designed to increase structured PA opportunities and enhance gross motor development in young children. This study evaluates, through structural equation modeling (SEM), the relationship between PA, gross motor (GM) performance, fitness, perceived athletic competence (AC), and weight status (BMIz) in preschool-aged children. Two models were tested: 1) Stodden et al.'s (2008) *Model on Developmental Mechanisms Influencing Physical Activity Trajectories of Children* and 2) one derived in the development of *Mighty Moves*.

Methods: 103 children (M=56.2 months; 54% girls; 35% Hispanic) attending 5 preschools in rural Colorado. Baseline data from the Colorado LEAP study were used to create latent variables: PA (accelerometers: moderate to vigorous PA during school, afterschool, and weekends); GM (*Bruininks-Oseretsky Test of Motor Proficiency*; subtest 6 (items 2 & 3 only) and subtest 7); Fitness (shuttle run, long jump, sit-ups); AC (6 items from Pictorial Scale of Perceived Competence and Social Acceptance). SEM using full-information maximum likelihood estimation was performed (Mplus 7.3).

Results: The model for *Mighty Moves* demonstrated that PA significantly predicts GM ($b=.65, p<.001$); GM significantly predicts both fitness ($b=.85, p<.001$) and AC ($b=.28, p<.047$); and fitness trends towards significantly predicting BMIz ($b=.22, p<.063$). Standard measures for model fit were in the range of generally accepted values (Test of Model fit, $\chi^2=119, p=.09$; RMSEA=.043; CFI=.93; TLI=.92). In contrast, our data did not fit Stodden et al.'s model (Test of Model fit, $\chi^2=229.5, p=.0006$; RMSEA=.066; CFI=.80; TLI=.77). A chi-square comparison of fit revealed that the *Mighty Moves* model fit significantly better than the Stodden, et al. model ($\chi^2=110.5, df=64, p<.005$).

Conclusion: The model tested here demonstrates that PA levels in young children directly relate to their GM performance, which impacts fitness and potentially weight status, thus validating the *Mighty Moves* intervention design. Perceived AC does not predict PA or GM abilities as hypothesized by Stodden et al.; rather GM predicts AC. Increasing PA opportunities in early childhood provides opportunities for the development of gross motor skills, the building blocks for advanced movement and sport-specific skills, and leads to a healthier lifestyle.

03.1.3

Impacts of the Melbourne InFANT Program help explain mechanisms of behaviour change observed in toddlers' television viewing

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SIG: Yes, Early care and education

Awards: No

Purpose:

Many young children (0-2 years) do not meet recommendations encouraging at least 3-hours of physical activity daily once walking young children and no screen-based media including television. Interventions to improve health behaviours generally target intermediary (mediating) factors to effect behaviour change. Assessing impact on these potential mediators is vital for understanding how an intervention worked yet many fail to investigate these mechanisms. This study aimed to investigate mediating pathways within an early childhood obesity prevention intervention on potential mediators of change in child physical activity and television viewing behaviours.

Methods:

Data were from the Melbourne InFANT program, a 15-month cluster-RCT commencing when infants were ~3-months old. Child television viewing and physical activity were assessed at intervention conclusion (child age ~20-months) by maternal report and accelerometers, respectively. Potential mediators (seven for physical activity and 6 for television viewing) were self-reported by mothers. Linear regression assessed intervention effects on potential mediators and associations between potential mediators and outcomes. Mediation was assessed by Mackinnon's product of coefficients method with bootstrapping.

Results/findings:

The intervention reduced children's television viewing time ($B=-14.1$; $CI_{95} -26.6, -2.6$) and improved maternal 'efficacy to limit television' ($B=0.1$; $CI_{95} 0.0, 0.2$), 'television knowledge' ($B=-0.3$; $CI_{95} -0.4, -0.2$) and 'use of television' ($B=-0.1$; $CI_{95} -0.2, 0.0$). These and 'facilitating television' were associated with child television viewing. Only the three scales impacted by the intervention mediated the intervention effect, in combination explaining 77% of the effect on children's television time. There was no intervention effect on children's physical activity and no mediation was evident.

Conclusions:

Reductions in children's television viewing effected by this intervention were significant. These reductions appear to be largely explained by positive impacts of the intervention on mothers' efficacy for limiting television, knowledge of the consequences of television and their intended and actual use of television to entertain and distract their young child. These results support the effectiveness of educational and support strategies in interventions focusing on a reduction in young children's television viewing.

03.1.4

Testing a conceptual model of parenting styles, parenting practices and objectively-assessed physical activity among 5-6 year old children

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SIG: Yes, Children and families

Awards: No

Objective:

To investigate evidence for a conceptual model of physical activity parenting which hypothesizes that physical activity-based parenting practices mediate the association between parenting styles and young children's physical activity.

Methods:

In a cross-sectional survey, 770 parents (n mothers = 572, n fathers = 198) of 5-6 year old children, recruited from 57 primary schools in the Bristol (UK) area, self-reported their parenting style (i.e., nurturance and control) and physical activity-based parenting practices (i.e., logistic and modelling support) using previously validated scales. Study children (n boys = 404 boys, n girls = 366) wore an Actigraph GT3X accelerometer for five days to estimate minutes spent in MVPA. Those who provided at least three valid days (i.e., 500 minutes of data, after excluding intervals of ≥ 60 minutes of zero counts allowing up to two minutes of interruptions) were included in analysis. Linear regression, adjusted for parent gender and age and child gender, BMI z-score and deprivation, was used to examine direct and indirect (mediation) associations.

Results:

A nurturing parenting style was positively associated with parent's provision of modelling and logistic support for physical activity. Nurturance was not directly associated with child physical activity. Modelling support was associated with greater child physical activity and a small indirect (mediation) path from parent nurturance, through modelling support to child's physical activity, was identified.

Conclusions:

While parenting style was not directly associated with the physical activity of 5-6 year old children, there was some evidence for the proposed mediation model (nurturance \rightarrow parent practices \rightarrow child physical activity). In particular, the association between modelling support and physical activity suggests that parents should be mindful of *how they model active or inactive behaviors to their young children. Further research is needed to identify a broader range of antecedents* which underpin adaptive physical activity parenting practices

O3.1.5

How does teacher BMI affect relationships between teacher PA practices and teacher-led PA at child care settings?

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Purpose: Teacher-led physical activity (PA) is important source of PA for children attending center-based childcare; however, little is known about factors associated with the provision of teacher-led PA. This study examined relationships between teacher PA practices and amount of teacher-led PA in center-based childcare, and the moderating role of teacher body mass index (BMI) on these relationships.

Methods: Data were collected in 50 childcare centers in North Carolina. Using the Environment and Policy Assessment and Observation (EPAO) protocol, trained research staff observed each center's PA environment over four consecutive days (from arrival of children in the morning, through end of the day) to assess daily routines. Teachers-reported height, weight, confidence in PA promotion in the classroom, and demographics were averaged at the center level. Generalized linear models were conducted in SAS v9.3 (Cary, NC) to examine the moderating effect of teacher BMI status (normal, overweight, obese) on the relationship between teacher PA practices and average amount of teacher-led PA. A p-value of <0.15 was used to determine statistical significance of interaction terms.

Results: 42 centers were included in the analysis. On average, teachers provided 9.9 minutes of indoor and 6.6 minutes of outdoor teacher-led PA daily. A significant interaction was found between teacher BMI status and confidence ($\beta = -5.5$, $p = 0.08$) for amount of indoor teacher-led PA, controlling for staff age and race. Among healthy weight, teachers who reported higher confidence in PA promotion was observed providing more teacher-led PA indoors (BMI=18-25, $n = 10$ centers, $\beta = 2.6$) while overweight and obese teachers reported less (BMI=25-29.9, $n = 17$ centers, $\beta = -0.4$) and (BMI=30+, $n = 15$ centers, $\beta = -5.6$), respectively. Confidence was positively associated with amount of outdoor teacher-led PA across all teacher weight statuses, and no differences were observed by teacher BMI status.

Conclusions: A moderating effect of teacher BMI on the relationship between confidence in PA promotion and amount of indoor teacher-led PA was observed, but not for outdoor teacher-led PA. Research focused on teacher-led PA should consider contextual factors such as these while developing interventions.

O4.1. ORAL:

Physical activity, sedentary behavior and health

O4.1.1

Concurrent and longitudinal associations of physical activity and sedentary behaviors with adiposity in a nationally representative cohort of U.S. adolescents

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: We examined potential gender differences in concurrent and two-year prospective relationships of adolescent physical activity and sedentary behaviors with two independent cardiovascular disease risk factors, body mass index and waist circumference.

Methods: Data are from the first three waves of a nationally representative cohort of 10th-grade U.S. students (mean age = 16.2; $n = 2784$). Height, weight and waist circumference were measured annually using standard protocols. In addition, a survey provided annual self-reported height, weight, physical activity, screen-based sedentary behaviors, and consumption of fast food, breakfast, and fruits and vegetables. Parents provided their educational levels. Multiple imputation with chained equations was performed to address subject- and item- nonresponse in all the variables. Generalized estimating equations, accounting for the complex survey design and adjusting for race/ethnicity, gender, parent education, family affluence, and eating behaviors, were used to estimate the concurrent and prospective associations of physical activity and screen-based sedentary behaviors with body mass index adjusted for age and gender (using measured height and weight and the CDC growth charts) (BMIZ) and waist circumference (WC).

Results: BMIZ decreased across assessments ($p < .0001$); however, the change was significant in male adolescents ($p = .0003$) but marginally in females ($p = .068$). WC did not change significantly over time. In concurrent analyses, physical activity was negatively related to BMIZ ($b = -.040$, $p = .0039$) and WC ($b = -1.240$, $p < .0001$) in male adolescents but unrelated to BMIZ or WC in females. Concurrent analysis of sedentary behavior indicated a positive relation with the measures of adiposity. Sedentary behavior was positively related concurrently to both BMIZ ($b = .028$, $p = .0247$) and WC ($b = .352$, $p = .0150$) in male adolescents and positively related to WC in females ($b = .300$, $p = .0089$). Prospectively, neither physical activity nor sedentary behavior was related to BMIZ or WC in male or female adolescents.

Conclusions: Adolescent physical activity and sedentary behaviors were independently associated with BMIZ and WC concurrently in the predicted directions. Although male BMIZ changed over time, the change was unrelated prospectively to prior physical activity or sedentary behavior.

O4.1.2

Sitting and mortality risk in the Whitehall II cohort: a 14 year follow-up study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Existing prospective studies of sitting and mortality risk have tended to utilise single indicators of sitting. This study examined associations of 5 different indicators of sitting time: total and context specific sitting at work, during leisure time, watching TV, and during leisure time excluding TV. We studied risk of mortality from all causes, coronary heart disease (CHD) and cardiovascular disease (CVD) in a cohort of middle-aged British Civil Servants

Methods: Participants (3720 men, 1414 women) from the Whitehall II cohort study provided information on sitting behaviour and covariates (age, sex, ethnicity, employment grade, smoking, alcohol intake, fruit and vegetable consumption, self-rated health, physical activity, and BMI) in 1997-99. Mortality to 31 August 2012 was analysed using Cox proportional hazards models to investigate prospective associations between sitting time (h/week) and mortality from all causes, CHD and CVD.

Results: During 72338 person-years of follow up (mean follow-up time 14.1±1.8yrs) 385 deaths were recorded (79 CVD and 40 CHD). No significant associations were observed between any of the five sitting indicators with mortality from all-causes (HR [95%CI] for highest sitting group relative to reference; work 0.77 [0.52, 1.14] p_{trend}=0.57, TV 1.02 [0.67, 1.56] p_{trend}=0.73, leisure time excluding TV 0.92 [0.63, 1.34] p_{trend}=0.70, leisure time 1.26 [0.94, 1.69] p_{trend}=0.37, total 0.97 [0.70, 1.33] p_{trend}=0.12); CVD (work 0.58 [0.23, 1.47] p_{trend}=0.50, TV 0.71 [0.32, 1.55] p_{trend}=0.18, leisure time excluding TV 0.56 [0.25, 1.26] p_{trend}=0.57, leisure time 0.96 [0.53, 1.76] p_{trend}=0.84, total 0.68 [0.33, 1.41] p_{trend}=0.42), or CHD (work 0.81 [0.25, 2.68] p_{trend}=0.74, TV 0.99 [0.33, 2.92] p_{trend}=0.31, leisure time excluding TV 1.14 [0.35, 3.73] p_{trend}=0.92, leisure time 1.83 [0.74, 4.53] p_{trend}=0.50, total 1.35 [0.51, 3.56] p_{trend}=0.34). Mean (±SD) reported moderate to vigorous physical activity (MVPA) was 2.06 ± 1.69 h/day and mean reported daily walking was 42.68 ± 22.60 m/day.

Conclusions: Sitting time did not predict all-cause, CHD or CVD mortality risk. Potential explanations include the protective effect of high levels of walking and MVPA reported by the sample. Policy makers and clinicians should be cautious about recommending sitting reductions as the sole intervention to reduce health risks.

O4.1.3

Association of Breaks in Sedentary Time with Physical Function Loss in Osteoarthritis Initiative

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Sedentary lifestyles are increasing and are hazardous to health. Excess sedentary time can ultimately threaten an individual's functional abilities and independence. The purpose of this study was to investigate whether objectively measured frequency of breaks in sedentary time is independently associated with physical function loss among older adults with or at elevated risk for knee OA.

Methods:

Prospective multi-site subcohort of 1625 community dwelling adults in the Osteoarthritis Initiative (OAI) aged 49-83 years with radiographic knee OA or knee OA risk factors. Physical function was assessed using 20-meter walk and chair stand testing at baseline and 2 year follow-up (OAI 48 and 72 month visits). Physical function change was the difference between 2-year and baseline measures. Negative values in change indicate physical function loss. Sedentary time, frequency of breaks in sedentary time, and moderate-to-vigorous physical activity (MVPA) time were objectively measured using accelerometers at baseline. Sedentary behavior was identified by accelerometer activity counts/minute <100. A sedentary break was defined as an interruption in sedentary time by any duration of counts ≥100 per minute. The association between the frequency of breaks in sedentary time with physical function loss was examined by multiple linear regression adjusting for socioeconomic factors (age, sex, race/ethnicity, education), health factors (comorbidity, body mass index, knee pain, knee OA severity, knee symptoms), baseline function, and average daily sedentary and MVPA minutes.

Results:

On average, adults with or at elevated risk for knee OA spent 66% of their daily awake time in sedentary behavior and had 8.9 breaks/sedentary hour (SD=2.4). Study participants on average lost function over two years in both gait speed (-6.10 feet/minute) and chair stand rate (-0.38 repetitions/minute). Frequency of breaks during sedentary time was inversely associated with subsequent functional loss in gait speed (p for trend<0.009) but not in chair stand rate (p for trend=0.08) adjusted for sedentary and MVPA time, socioeconomic and health factors.

Conclusions:

Promoting frequent breaks during sedentary time might be useful in maintaining or minimizing physical functional loss. This novel finding is important for the design of effective lifestyle interventions targeting adults with or at elevated risk for knee OA.

O4.1.4

Physical activity patterns are associated with health related physical fitness in Flemish adults.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: To address the question if a more stable physical activity pattern is as good to improve health related physical fitness (HRF) than one with highs and lows. Do adult people differ in HRF if they have the same Physical Activity Level (PAL) but a different manner on reaching this (i.e. continuously light active, or very sedentary with short vigorous intervals). We hypothesize that both activity patterns result in the same level of HRF, taking into account both the negative effects of sedentary behavior and the positive effects of moderate and vigorous physical activity.

Methods: The study sample consisted out of 296 Flemish adults (63 % men) with an average age of 53.7 years (SD = 8.94). Physical activity and sedentary behavior were objectively measured with the Sensewear Pro Armband. The (in-)stability of the physical activity pattern is indicated with the Gini-index. The Gini-index is a measure of statistical dispersion and expresses the inequality of the physical activity pattern of each subject in a value between 0 and 1.

Health related fitness, defined by ACSM, consists out of 4 components. First, cardiorespiratory fitness measured with a Lode Excalibur cycle ergometer as VO₂peak. Second, muscular fitness (MF) consisting out of two sub-parameters (muscular endurance measured with a Biodex System pro 3 dynamometer and muscular strength measured with a hand grip dynamometer). Third, body composition (FAT%) measured with a bio electrical impedance analysis. Fourth, flexibility measured with the sit and reach test.

Results/findings: Preliminary results show that PAL explained a significant proportion of variance in VO₂peak ($R^2 = .13$), muscular fitness ($R^2 = .05$) and body composition ($R^2 = .16$). Including the Gini-index into the model only added a small significant extra explained variance of 1.5% for FAT% and 2.1% for MF.

Conclusions: PAL is the main predictor of HRF regardless of the physical activity pattern. Concrete, reaching a high PAL is important to improve your HRF, regardless of how you reach this high PAL. Therefore, adding longer periods of light physical activity to the health norm might be interesting.

O4.1.5

Isotemporal substitution analysis for non-movement behaviors and body weight status in children

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: TV viewing has been found to be associated with childhood obesity. However, relationship between total sedentary time, when measured objectively, and weight status is equivocal. Such association may be better explained by the effects on snack intake than displacement of moderate-to-vigorous physical activity (MVPA). Little study has examined snacking habit alongside sedentary activities other than media use and investigated the substitution effects of various sedentary activities on obesity. Therefore, this study examined the prospective associations of reallocating screen time to other non-movement activities (academic activities, other sedentary activities and sleep) on obesity in children using isotemporal substitution analysis.

Methods: Grades 1-3 Chinese children were recruited in 2009. Each child wore an ActiGraph GT3X accelerometer for eight consecutive days to determine their MVPA. Leisure time sedentary behaviors, sleep duration, snacking habit alongside the sedentary behaviors, and socio-demographic variables were reported by parents. Sedentary behaviors were then grouped into three categories, i.e. screen time, academic activities and the others. Body weight and height were assessed by trained assessor and body mass index were then calculated. All the measurements were conducted again at one-year (T1) and two-year (T2) follow-ups. Isotemporal substitution models were performed to examine the associations of non-movement activities (sleep and the three groups of sedentary activities) assessed as mean values across three assessments with obesity while controlling for MVPA.

Results: 872 children (469 boys, mean age at recruitment: 7.5 years) who provided valid ActiGraph data for at least one assessment time point were included in the analysis. While controlled for age, gender, parental education level and MVPA, isotemporal substitution analysis indicated that reallocation of 30 minutes/day of screen time with an equal amount of the other sedentary activities ($B=0.807$, 95% confidence interval: 0.656, 0.993) and sleep ($B=0.800$, 95% confidence interval: 0.661, 0.969) was associated with decreased risk for obesity. Snacking habit was the most prevalent alongside TV viewing, following by playing electronic games and doing homework.

Conclusions: Obesity risk may be reduced by replacing screen time with other types of sedentary activities and sleep. Controlling snacking habits accompanying sedentary behavior should be targeted in future interventions.

05.1. ORAL: Healthy neighborhoods for adults

05.1.1

Introduction of new neighbourhood infrastructure to change health and health-related behaviours: A scoping literature review to guide future research

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Reviews of cross-sectional evidence support a relationship between built environments and health and health-related behaviours. However, evidence of longitudinal experimental data exploring the effects of introducing new built infrastructure is limited. The purpose of this investigation was to examine studies exploring the effects of introducing new neighbourhood built infrastructure, in longitudinal studies, on health and health behaviours of residents. A review was conducted to identify future research needs.

Methods: Embase, MEDLINE, Pubmed, Web of Science and CINAHL databases were searched using keywords relating to: the built environment; health and health-related behaviours; and study design. Inclusion criteria were: introduction of new public built environment infrastructure; participants residing in close proximity to infrastructure; any health or health behaviour outcomes measured; and experimental or quasi-experimental natural experiments of longitudinal design, with/without a comparison site. Multi-component interventions targeting more than the built environment, and residential relocation studies, were excluded.

Results: Fourteen papers were located, reporting on the impact of the following type of built environments: cycle routes; rail stops; trails; and food retail (including supermarkets and farmers markets). Three studies were conducted in the UK and nine were conducted in the US. Four studies included a comparison group, whilst the remaining eight studies were of one group pre-test, post-test design. Publication date ranged from 2002 to 2014. One paper incorporated mixed-methods, with all others including solely quantitative methods. Reported health and health behaviour outcomes in the included papers were: physical activity (including cycling commuting, total physical activity; diet; general health and/or well-being; BMI and/or obesity; and mental health). Effects of interventions on health and health behavior outcomes were mixed, with some studies reporting benefits and others finding no change or deleterious effects.

Conclusions: There is a need for longitudinal studies exploring the introduction of new public built environment infrastructure to be conducted outside of the US and UK. The majority of studies focused on physical activity, therefore future studies should also include other important behaviours, such as diet, and an array of health and well-being related outcomes. Comparison sites not undergoing infrastructure change should be included in studies to help support causation.

05.1.2

Are we creating POSitive Places for active living through urban planning policy? Developing and validating national liveability indicators of public open space in Australia

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective

Green spaces, such as parks, are crucial pieces of infrastructure for urban liveability and the wellbeing of residents. The provision and spatial distribution of public open space (POS) throughout cities relies primarily on government urban planning policies. However there appears to be little or no evidence-based approaches to developing recommendations or standards for POS provision - indeed most of the current Australian standards are derived from older British and/or American standards, with little rationale for their relevance to Australia. Further, how different POS policies impact on health and wellbeing outcomes remains unknown. This study will develop and test policy-relevant POS spatial measures against health and well-being outcomes, with the view to creating a validated, set of national POS liveability indicators.

Methods

A review of Australian state-government POS planning policies was undertaken to identify requirements that could be spatially represented in a Geographic Information System (GIS). Spatial data available to populate these measures nationally were simultaneously identified. The proposed list of spatial measures was circulated to policy makers for endorsement. Initially, the spatial policy measures will be validated with geo-coded health data in the state of Western Australia, and then modelled against behaviours such as overall and recreational walking, and mental health. Associated measures will be generated at a national scale across Australia.

Results

A number of policy-relevant POS spatial measures were identified, including different measures and standards of POS provision (i.e., area-percentage or population-ratios), types of POS (i.e., sizes/functions) and levels of access to POS (i.e., proportions of dwellings required within specified distances). The indicators will be tested using data from the Western Australian RESidential Environments (RESIDE) project. Policy measures (and standards) significantly associated with selected health behaviours and outcomes will be up-scaled and applied nationwide to create a national set of validated POS indicators.

Conclusions

The development of national evidence-based, policy-relevant POS indicators has the potential to inform future POS planning policies and decisions. These can be used to benchmark planning policies within and between cities and support equitable POS provision, and to evaluate policy reform over time. These indicators can also facilitate national-level research in Australia.

05.1.3

Are 'liveable' communities associated with physical activity and dietary behaviours? Developing and validating a set of national liveability indicators

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SIG: Yes, Policies and environments

Awards: No

Purpose: Creating 'liveable' communities is a growing aspiration of city planners globally. Liveable communities create conditions that optimise residents' health and wellbeing outcomes by creating environmentally sustainable, safe and socially cohesive communities with affordable housing linked by public transport, walking and cycling to employment, public open space, local amenities and services, and healthy food options. This presentation describes the National Liveability Study (NLS) which aims to develop a national set of spatially-attributable liveability indicators that are: (a) aligned with state and federal urban policy; (b) derived from readily available national spatial data; (c) standard and consistent over time; (d) validated against selected chronic disease risk behaviours and health outcomes; (e) practical for measuring local, national and federal built environment policy interventions; and (f) suitable for monitoring progress towards creating more liveable, equitable and sustainable communities.

Methods: Over two years, the NLS will develop and validate a national set of spatially-derived built environment liveability indicators. Geographic Information Systems (GIS) spatial-measures developed using fine-grained state-level data will be validated against physical activity and eating behaviour outcomes. Liveability indicators found to be significant will be compared with those derived using coarser national data. Once finalised, a national database of open-source built environment liveability indicators will be created, for linkage to large-scale geocoded national population health studies.

Results: The project is overseen by a national advisory group comprising State and Federal government stakeholders, and Federal non-government organisations. A national technical team has been assembled. A policy analysis of five liveability domains is now complete, which will inform the development of liveability measures to be tested against a suite of health behaviour outcomes.

Conclusion: This project will develop a national set of indicators to help monitor progress towards creating healthy and liveable communities. It will build capacity for built environment and health systems research, by developing a national data base of geo-spatial data that can be linked to other studies. The challenges presented by this type of project will be discussed.

Acknowledgements: Co-investigators Gavin Turrell, Fiona Bull, Sally Redman, Adrian Bauman, and Rachel Davey; Chris Pettitt, Xiaoqi Feng, Jerome Rochelle, Sarah Thackway and Melanie Chisholm.

05.1.4

Longitudinal effect of the neighborhood built environment on recreational walking: The RESIDE Study

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Longitudinal repeated measures studies allow a stronger assessment of the effect of the built environment on physical activity than cross-sectional studies. We used longitudinal data over seven years (four surveys) from the RESIDE study to examine the effect of objective and perceived measures of the neighbourhood built environment on neighbourhood recreational walking.

Methods: RESIDE is a longitudinal natural experiment of people building homes in 73 new housing developments in Perth, Western Australia. Participants were surveyed four times: baseline (n=1771); then one (n=1383), three (n=1176), and seven years (n=541) later. Frequency of neighbourhood recreational walking (number of times a person leaves their home to walk locally) was collected using the Neighbourhood Physical Activity Questionnaire. Objective built environment measures were calculated using Geographic Information Systems and included land use mix, connectivity, residential density, count of types of public open space, services and convenience stores. Comparable perceived built environment measures included Neighbourhood Environment Walking Scale (NEWS) sub-scales. Generalised linear regression models were used to obtain estimates that were not confounded by neighbourhood selection factors.

Results: On average participants walked for recreation in the neighbourhood 2.0 (SD 2.6), times/week at baseline, and 2.6 (SD 2.8) 2.4 (SD 2.9) and 2.4 (SD 3.0) times/week at one, three, and seven years follow-up. Objectively measured built environment determinants of increased neighbourhood recreational walking included greater land use mix, access to a medium/large size park and beach access (all p<0.05). Higher perceived land use mix, street connectivity, neighbourhood aesthetics, safety from crime and access to a park and beach were also determinants of increased neighbourhood recreational walking (all p<0.05).

Conclusions: Public open space provision and a diversity of destinations support more recreational walking. Better access to a variety of local recreational destinations may be beneficial for adult physical activity levels. Perceived neighbourhood attractiveness and safety of the neighbourhood also influences recreational walking. These findings provide policy-makers and urban planners with stronger evidence of a causal relationship between the built environment and recreational walking and highlight specific interventions required when planning new or retrofitting established neighbourhoods to increase recreational walking and meet resident's health needs.

O5.1.5

Gene-environment effects of the neighborhood context on obesity and physical activity in African-American adults.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: African-American adults are disproportionately affected by obesity and related chronic disease, and both environmental stress and genetic risk may play a role in its development. The aim of this study was to test the interacting gene-environment impact of neighborhood contextual factors (social interaction, satisfaction, collective efficacy) and genetic risk for obesity on body mass index (BMI) and moderated-to-vigorous physical activity (MVPA). The study hypothesized an additive risk interaction such that more stressful contextual factors would have a greater adverse impact on individuals with higher genetic risk.

Methods: Cross-sectional data were collected from 211 African-American adults who participated in the Positive Action for Today's Health (PATH) trial, a community-based program to increase walking in underserved (low-income, high-crime) communities. BMI and daily accelerometry-estimated MVPA were collected as outcomes. Buccal swab samples were collected and twelve polymorphisms that have been reliably linked to obesity-related outcomes were genotyped and indexed using a dominant gene model. Environmental factors were measured via survey, including the Neighborhood Social Interaction and Collective Efficacy scales, and the Neighborhood Satisfaction subscale of the Neighborhood Environment Walkability Survey.

Results: The sample was predominantly female (65%) and overweight ($M_{BMI}=31.77$, $SD=8.64$), with an average age of 52.58 ($SD=15.48$), and average daily MVPA of 28.53 minutes ($SD=34.76$). Genetic risk was directly related to higher BMI ($\beta=10.951$, $p<.01$), and neighborhood social interactions showed an inverse trend with BMI ($\beta=-1.584$, $p=.06$). The interaction of collective efficacy and genetic risk was significant ($\beta=11.593$, $p<.05$); at low levels of collective efficacy genetic risk did not differentiate BMI, however at high levels of collective efficacy, BMI was reduced with modest-to-low genetic risk.

Conclusions: This study is the first to investigate the neighborhood context as a measure of the "environment" in a "gene-environment" interaction model, and the first to assess these processes in at-risk African-American communities. Direct and interacting gene-environment effects of neighborhood contextual factors, and particularly of collective efficacy, and genetic risk on BMI were found. Findings may inform public policy efforts to decrease obesity-related health disparities by paying greater attention to the neighborhood context in at-risk populations.

O6.1. ORAL:

Socio-economical status and health across the lifespan

O6.1.1

Relationship between moderate-to-vigorous physical activity and socio-economic status across 12 countries: The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE)

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

The relationship between moderate-to-vigorous physical activity (MVPA) and socio-economic status (SES) has not been well-examined on a global scale. The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE), enrolled children from 12 sites representing countries with a wide range of human development indices (HDI) (Australia, Brazil, Canada, China, Colombia, Finland, India, Kenya, Portugal, South Africa, the United Kingdom, and the United States). Therefore, ISCOLE provided a unique opportunity to more robustly examine this relationship.

Purpose: To examine the relationship between MVPA and SES across countries of varying levels of socio-economic development.

Methods: Children were recruited in schools, which were stratified to maximize SES variability within each site. MVPA was objectively measured using the ActiGraph GT3X+ accelerometer. SES was determined from self-reported household income from parents. Within each site, SES was collapsed into four levels closely representing quartiles. Missing values for SES ($\approx 11\%$) were multiply-imputed. Multi-level random effects models that accounted for clustering at both the school and site levels were used to examine MVPA by SES gradients. Results were averaged across 5 imputed datasets, and the standard errors were adjusted appropriately. Least-square means for MVPA were estimated separately for boys and girls at the sample 10th, 50th, and 90th percentiles for HDI.

Results: 6,548 children (54% girls) 9-11 yrs of age were included in the analysis. For boys, results showed MVPA to be negatively associated with SES at lower levels of HDI, with a difference of 16 min/day ($p<.001$) between the lowest and highest SES levels; and for mid-level HDI with a difference of 7 min/day ($p<.001$). For girls, MVPA was also negatively associated with SES at lower and mid-levels of HDI (with a difference between SES levels of 10 and 3 min/day, respectively, all $p<.02$); and positively associated with SES at higher levels of HDI (difference of 4 min/day, $p=0.04$).

Conclusion: At lower and mid-levels of HDI there was a negative relationship between MVPA and SES across sexes. However, this relationship became nonexistent or reversed at higher HDI levels. This information is crucial when developing multi-country physical activity interventions because the targeted at-risk population may differ.

O6.1.2

Healthy Homes Healthy Families: Results of a pilot study to prevent obesity in 2-5 year old children from low income families

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SIG: Yes, Children and families

Awards: No

Background: This study examined the feasibility and acceptability of a home-based intervention to empower low-income racially/ethnically diverse parents with children aged 2-5 to modify the home environment to improve obesity-related nutrition and physical activity (PA) behaviors.

Methods: A prospective study was conducted with 50 parent-child pairs. Pre/post evaluation included baseline and 4-month assessments including telephone and in-person surveys, a home audit and anthropometric measures to examine potential changes in dietary, PA, and sedentary behaviors among children. The intervention included: three 30-minute motivational interviewing telephone calls, four sets of tailored written materials; a family PA video, and a TV control device. The intervention focused on changing the home environment and parent behaviors related to increasing PA, reducing screen time, reducing sugar sweetened beverages (SSB), juice, and fast food (FF), and increasing water and fruit/vegetables (FV) among their children.

Results: Almost half of the children were Hispanic and 99% of the parents were female. Baseline data demonstrated that juice intake was high; 50% of children drank SSB in last month; 40% drank whole milk; 74% ate FF > once a week; 71% of homes had 3+ TVs; 72% of children had TV in bedroom. Parent role modeling of healthy behaviors was also low. A total of 39 (78%) parent-child pairs completed the 4-month follow-up. Vegetable intake among children significantly increased at follow-up (from 0.28 to 0.54 cups, $p=0.0001$) and fruit juice intake decreased at follow-up (from 16 to 11.9 ounces, $p=0.036$). Children also significantly decreased TV-watching time on weekdays (from 147 minutes to 111 minutes, $p<0.01$). In addition, the number of homes with TV sets in the child's bedroom decreased (from 70% to 60%, $p<0.001$). Parent behaviors related to role modelling, the home food environment, family support for PA, family encouragement for PA/diet and parent household rules also significantly improved over the course of the intervention.

Conclusions: Low income families of 2-5 year old children have a high prevalence of obesity-related risk factors in the home. A home-based early childhood obesity prevention intervention is feasible, acceptable and demonstrates short-term effects on dietary and sedentary behaviors of low-income racially/ethnically diverse children.

O6.1.3

Mid-intervention findings from the Physical Activity 4 Every1 trial: a cluster RCT in secondary schools located in low-income communities.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective:

Adolescence is a recognised period of physical activity decline, particularly among youth living in low-income communities. The primary aim of this study was to examine whether a two-year multi-component physical activity intervention implemented in disadvantaged secondary schools could reduce the decline in physical activity. This presentation reports on the 12 month mid-intervention effects.

Methods:

A cluster randomized trial was undertaken in 10 secondary schools located in socioeconomically disadvantaged areas in New South Wales, Australia. The trial recruited students in Grade 7 (first year of secondary school), with follow-up in Grade 8 (12 month). The intervention was implemented within school terms and was guided by socio-ecological theory. Seven physical activity strategies, and six implementation adoption strategies were used to assist schools to implement the intervention. The primary outcome for the study was mean minutes of moderate-to-vigorous physical activity (MVPA) per day assessed using Actigraph GT3X accelerometers. Outcome data were analyzed using repeated measures linear mixed models.

Results:

At baseline, 1150 (93%) students participated in the data collection (mean age 12.0 years, 48% boys) and 1050 (84%) students participated at 12-month follow-up. By 12-month follow-up, the six implementation adoption strategies had been used to support schools to deliver four of the seven physical activity strategies. There was a significant group-by-time interaction for mean minutes of MVPA per day in favor of the intervention group (adjusted mean difference = 3.85 minutes, 95% CI [0.79 - 6.91], $p \leq 0.01$), including significantly more vigorous physical activity (2.45 minutes, $p \leq 0.01$), equating to 27 minutes more MVPA per week. Mean accelerometer counts per minute (CPM) were also significantly higher in the intervention group (31.02 CPM, [9.05 - 53.00], $p \leq 0.01$).

Discussion:

At 12-month follow-up, the intervention was effective in reducing the decline in physical activity among adolescents from schools located in low-income areas. The intervention could be used by schools to assist students in meeting nationally recommended physical activity guidelines.

O6.1.4

Social support is directly and indirectly associated with physical activity in young women from socioeconomically disadvantaged neighbourhoods – A longitudinal mediation analysis

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Levels of physical activity (PA) decrease when transitioning from adolescence into young adulthood. Theoretical models, such as the social-cognitive theory and the socio-ecological model, and evidence suggest that social support and personal factors (self-efficacy, outcome expectations, enjoyment) are associated with PA. However, little is known about what mediates the association between social factors and PA. Furthermore, the majority of this research is cross-sectional; longitudinal studies are needed. Therefore the aim of the present study was to explore whether associations between social support from family and social support from friends, and leisure-time PA (LTPA) were mediated by personal factors (i.e. enjoyment of PA, PA outcome expectations, self-efficacy for PA) using cross-sectional and longitudinal data obtained from young Australian women (aged 18-30 years) living in disadvantaged neighbourhoods.

Methods: Survey data was collected as part of the READI study in 2007-2008 (T1, N= 1197), 2010-2011 (T2, N= 427) and 2012-2013 (T3, N=337). A series of single-mediator models were tested using baseline (T1) data only. These single-mediator models were repeated using longitudinal data from all three time points (based on residual change scores for changes between two measurements).

Results: Cross-sectional analyses found that associations between social support from family and social support from friends, and LTPA, were mediated by all personal factors. Social support was both directly and indirectly associated with LTPA, with each personal factor explaining between 79.7-97.6% of the associations. In the longitudinal analyses, enjoyment and self-efficacy were significant mediators of the association between social support from friends and LTPA, explaining 56% and 34.1% of the relationship, respectively.

Conclusion: The current longitudinal analyses found that self-efficacy for, and enjoyment of, PA partly explained the relationship between social support from friends and LTPA in young Australian women living in disadvantaged neighbourhoods. Thus, these results suggest that a supportive network of friends can facilitate LTPA through increases in women's self-efficacy and enjoyment of PA. Interventions to increase LTPA targeting young adult women may benefit from strategies to enhance social support from friends.

O6.1.5

Preschool-Delivered Multiple Micronutrient Powders Reduce Anemia and Improve Iron Status, Growth, and Development in Rural India

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SIG: Yes, Early care and education

Awards: No

Purpose: One-third of children under age 5 years in low and middle-income countries do not reach their developmental potential, primarily due to chronic undernutrition and lack of early learning opportunities. The objective is to evaluate preschool-delivered multiple micronutrient powder (MNP) added to food on micronutrient status, growth, and development.

Methods: 22 state-supported preschools in rural India were classified as High/Low Quality based on the Early Childhood Environmental Rating Scale. Using cluster randomization, preschools received MNP (iron, zinc, vitamins A, B2, B12, C and folic acid) vs. placebo (B2) added to the mid-day meal (1 gram/child) in a double-masked design. Evaluations among 321 preschoolers at baseline/endline (6 months) included 2 ml venous blood tested for anemia and micronutrient status, anthropometry, and child development (Mullens Scales of Early Learning, Inhibitory Control, and parent report of child behavior). Data were analyzed using 2X2 ANOVA, adjusting for baseline, with MNP/placebo X High/Low preschool quality interactions to examine whether MNP impact varied by preschool quality.

Results: Baseline prevalence of anemia (47.8%; Hb<11g/dL), inadequate iron stores (44.9%; ferritin<12µg/L, 66.9% transferrin receptor>29.5nmol/L), stunting (40%; height/age z-score<-2) and underweight (46%; weight/age z-score<-2) was similar across groups. Compliance (percent meals consumed) was similar (80.1±16.0). At endline, the prevalence of anemia and micronutrient deficiencies was lower in the MNP group, compared to the placebo group (Hb 9.5% vs 35.1%, ferritin 7.9% vs.51%, transferrin receptor 24.5% vs.66.4%, p<0.05 for all). Height/age z-scores increased among the non-stunted children in the MNP group (HAZ change: 0.08; p=0.03). Interactions between MNP/placebo and preschool quality were significant for expressive language, inhibitory control and child behavior scores (p<0.05), with greater improvement among children in the low quality preschools MNP group compared to the other 3 groups (placebo and high quality preschools MNP), p<0.05 for all.

Conclusions: Preschool-delivered MNP improved children's micronutrient status, growth, and development. The effects of MNP on child development were stronger among low quality preschools, illustrating the ecological and multifactorial aspects of child development and the importance of considering preschools as a context for nutritional interventions.

07.1. ORAL:

Measurement of physical activity and sedentary behavior

07.1.1

Using GPS, GIS, and accelerometer data to predict transportation modes: An application of the Random Forest method

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Active transportation is a substantial source of physical activity, which has a positive influence on several health outcomes. Measuring transportation modes is challenging and requires high time and financial investment. This study proposes a passive collection method based on random forests.

Methods: The RECORD GPS Study collected real-life trip data from 236 participants (or 7460 trips) over 7 days, including the transportation mode, GPS, GIS and accelerometer data. A prediction model of the transportation modes was built by the random forests method. Additionally, models were built for same-source variables. Finally, a simulation investigated the performance of models built on a limited amount of trips in predicting the transportation modes for a large amount of trips.

Results: The model had a correct prediction rate of 90%. A limited model of GPS combined with GIS data performed nearly as well. Relatively good predictions could be made by a model built on the 991 trips of the first 30 participants.

Conclusion: This study is the first to use real-life data from a large sample to test a prediction method for transportation modes. This method could improve future data collections by decreasing the workload for both participants and researchers and providing relevant data to investigate the relationships between transportation and health.

07.1.2

Differences in children's reported physical activity levels according to raw and count based accelerometer data

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Accelerometer assessed physical activity (PA) is often expressed in proprietary units called counts, with little information available to understand the processing of acceleration data. Recently, researchers have begun examining raw acceleration data and processing this into gravity-based units (*g*). Differences in data processing may influence reported PA and limit comparability between studies. Therefore, the purpose of this study was to examine differences in moderate (MPA), vigorous (VPA) and moderate to vigorous PA (MVPA) using raw and proprietary processing techniques.

Methods: ActiGraph GT3X+ accelerometers were worn on the right hip for one week by 130 children aged 9-10 years (79 girls). Raw acceleration data were processed using the ENMO method and data were also reduced into counts. To be included in analysis children were required to wear the monitor for at least nine hours on any three days. Ninety-three participants met the inclusion criteria. ENMO derived acceleration data were classified into MPA, VPA and MVPA intensities using published cutpoints (Hildebrand et al. 2014). Counts data were classified into the PA components using two empirical cutpoints (Evenson et al. 2008, Freedson et al., 1997). Repeated measures ANOVA was used to examine differences in PA levels across the three data classification methods.

Results: Mean MPA values reported using the Freedson cutpoints (91.5 minutes) were higher than those reported using the Evenson (35.9 minutes, $p < 0.01$) and ENMO (40.3 minutes, $p < 0.01$) cutpoints. ENMO MPA was higher than Evenson MPA ($p < 0.01$). Mean VPA reported using Freedson (29.9 minutes) was higher than both ENMO (7.4 minutes, $p < 0.01$) and Evenson (25.4 minutes, $p < 0.01$). Evenson VPA was higher than ENMO VPA ($p < 0.01$). Freedson MVPA (121.3 minutes) was higher than ENMO (47.7 minutes, $p < 0.01$), and Evenson (61.3 minutes, $p < 0.01$) respectively. ENMO MVPA was lower than MVPA reported using Evenson ($p < 0.01$).

Conclusions: Large differences in reported PA levels were observed across the three classification methods. These findings highlight the impact of data processing and cutpoint selection on PA outcomes. Further investigation is required to examine the differences in reported PA between proprietary counts and raw data analysis.

07.1.3

The measurement of physical activity behaviours of young people.

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: Previous research has largely relied upon subjective measures to record the locations for young people's PA (Collins et al., 2012). This study aims to use an accurate and objective measure of PA location, as well as establishing why young people use these locations and the built environment for PA.

Methods: Participants were 112 9-13 year olds attending a West Midlands (UK) school. Participants wore Global Positioning Systems (GPS) and heart rate (HR) monitors to identify the location and intensity of PA. A sub-sample of students took part in focus groups to establish reasons for and barriers to PA. HR data was analysed according to sedentary behaviour and moderate (MPA), or vigorous physical active (VPA) over four days. GPS data was analysed by identifying PA location and methods of travel (i.e. on foot, cycle, motor vehicle). A thematic approach was used to analyse focus group data.

Results/Findings: Initial descriptive analysis of GPS data reported daily mean HR at 97.4 bpm (± 13.3), mean maximum HR at 183.3 bpm (± 28), and mean distance travelled at 16.3 miles (± 22.1). Qualitative data from focus groups outlined reasons behind young peoples' choices for PA: *'It's the closest place for us all to meet up'; 'When you're doing sport it's fun and it's also getting you fit.'* The nature of PA is also identified: *'I go to the park, I ride my bike around the block'; 'I play at the college car park because it's big and my friends play there.'*

Conclusion: By combining methods to research young people's PA, in depth analysis can be carried out which outlines the nature and location of PA, and reasons for PA participation. The use of GPS systems and heart rate monitors are useful tools in objectively measuring activity. Future research that utilises a mixed-methods approach, in particular combining GPS and focus groups, is needed to establish reasons behind young people's choice of PA location to inform interventions and town planning to promote PA.

07.1.4

Using Heart Rate Variability Monitors to Estimate Energy Expenditure During Low, Maximal Intensity Activity and Daily Free-Living Conditions

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Measuring free-living and activity-specific energy expenditure (EE) is useful for a variety of purposes, however gold-standard EE measurement methodologies are incapable of providing time/activity-specific measures of EE in free-living conditions. There is high-demand for mobile-devices with these capabilities for personal, clinical, and research purposes. In response to the demand, heart-rate variability (HRV) monitoring is emerging as a useful measure for extrapolating EE and other physiological measures. However, for these benefits to be applied within non-athlete populations it is important that EE measurement accuracy is maintained when baseline testing (i.e. VO_{2max} test) is either unavailable or contraindicated due to health concerns. There is a need for assessment of HRV-derived EE across the full range of physical intensities and during free-living in non-athlete participants. The purpose of this study was to assess the accuracy of HRV-derived EE measures under different analysis conditions in relation to indirect calorimetry (IC) to better understand the utility of this novel methodology.

Methods: Participants (N=30) completed two laboratory-based treadmill tests: a 30-minute low-intensity walk test, and a VO_{2max} test, both while wearing a FirstBeat Bodyguard HRV monitor and having their expired gases analyzed by a SensorMedics Vmax-29c metabolic cart. Participants then continued to wear the FirstBeat HRV monitors for 4 consecutive days upon completion of the laboratory testing. HRV data were analyzed using FirstBeat SPORT software.

Results: During VO_{2max} testing, HRV-derived EE correlated strongly with IC-derived EE across all levels of FirstBeat SPORT software analysis. During the 30 min walk test, HRV-derived EE correlated moderately with IC-derived EE across all levels of FirstBeat SPORT software analysis. During free-living conditions, HRV-derived EE correlated strongly across all levels of FirstBeat SPORT software analysis.

Conclusions: HRV-derived EE accuracy improves, in comparison to IC, as activity-intensity increases. The results show that HRV-derived EE measures are similar across all levels of FirstBeat SPORT software analysis during low, maximal, and free-living activity. As such, HRV-derived EE measures possess clinical utility and may be used for EE monitoring purposes on an individual level without having to perform testing that is contraindicated in at-risk individuals.

07.1.5

The validity of consumer-level, activity monitors in free-living conditions

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: The aim of this study was to explore the validity of a selection of consumer-level accelerometer-based activity monitors in free-living conditions. The study addressed the research question 'are consumer-level, body-worn activity monitors valid measures of physical activity and sleep in adults in free-living conditions, relative to research-level accelerometers?'.

Methods: Using a cross-sectional design, 21 healthy adults wore seven consumer-level activity monitors (Fitbit One, Fitbit Zip, Jawbone UP, Misfit Shine, Nike Fuelband, Striiv Smart Pedometer and Withings Pulse) and two reference research-grade accelerometers/multi-sensor devices (BodyMedia SenseWear, and ActiGraph GT3X+) for 48-hours. Participants went about their daily life in free-living conditions during data collection. Validity of the consumer-level activity monitors relative to the reference devices for step count, moderate to vigorous physical activity (MVPA), sleep time and total daily energy expenditure (TDEE) was quantified using Bland-Altman analysis, median absolute difference and Pearson's correlation.

Results: All consumer-level activity monitors correlated strongly ($r > 0.8$) with research-grade devices for step count and sleep time, but only moderately-to-strongly for TDEE ($r = 0.74-0.81$) and MVPA ($r = 0.52-0.91$). Median absolute differences were modest (<30% of reference device mean values) for steps, sleep and TDEE, but large (26-298%) for MVPA. Across the constructs examined, the Fitbit One, Fitbit Zip and Withings Pulse performed most strongly.

Conclusions: The consumer-level activity monitors were highly valid for measuring steps and sleep duration, and moderately valid for measuring TDEE and MVPA. Validity for each construct varied between devices, with the Fitbit One, Fitbit Zip and Withings Pulse being the strongest performers.

08.1. ORAL:

Nutrition and food environment

08.1.1

Children's exposure to food and beverage marketing in public places

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SIG: Yes, Policies and environments

Awards: No

Purpose:

The ubiquitous marketing of energy-dense, nutrient-poor (EDNP) foods and sugar sweetened beverages (SSBs) is a key modifiable influence on childhood dietary patterns and obesity. Evidence consistently demonstrates that this marketing impacts children's consumption patterns by shaping their food preferences, purchase requests and nutritional knowledge. Little is known about children's exposure to food and beverage marketing other than via television, and there is no quantifiable evidence of the extent of children's exposure to the full range of marketing media in public places. This research investigates the extent, frequency and nature of children's exposure to food and beverage marketing in public places.

Methods:

Children aged 11-13 years ($n = 220$) from Wellington, New Zealand, wore an automated camera and a GPS device for four days to collect images of their everyday surroundings. The image data was analysed using content analysis to identify the marketed food and beverage brands and products to which the children were exposed. The GPS data was used to identify the location of those features. The nutritional value of the identified food and beverage products or brands was assessed and categorized as healthy or unhealthy using the Food Standards Australia New Zealand Nutrient Profiling Scoring Calculator.

Results/findings:

Children were exposed to food and beverage marketing on multiple occasions during each of the four days, the majority of which was for EDNP foods and SSBs. Exposures occurred on the journey to and from school, whilst out in the community, at sporting events or activities and at retail outlets. Marketing exposures ranged from large billboards in the central business district and posters displayed at local convenience stores to product packaging in retail outlets.

Conclusions:

Food and beverage marketing to children is frequently exposed to EDNP foods in multiple locations throughout the day. Restricting food marketing to children in outdoor spaces to reduce its visibility in areas children most frequently congregate and spend time, would likely have a positive impact on children's dietary behaviors.

08.1.2

Working on Wellness (WOW): Starr County, TX Takes Action to Promote Healthy Living

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Since the inception of the Starr County Community Transformation Grant (CTG) in July of 2011, the Working on Wellness (WOW) Coalition has steered several developments in the community geared toward promoting a lifetime of health through the power of prevention. The purpose of this presentation will be to provide participants with the strategies and resources that have supported environmental change in South Texas. This geographical location is one of the many limited resource areas on the border of Texas and Mexico. Numerous other areas across the world face the same challenges as this community, which include few opportunities for fresh produce and limited options for places to be physically active. Without these opportunities, it is considerably harder to make living healthy the easier choice.

Methods: External evaluators from the University of Texas School of Social Work created a neighborhood food and outdoor recreational physical activity assessment tool that was performed to collect baseline data. 128 stores and 22 outdoor facilities were analyzed and demonstrated a need and established certain priorities for interventions. As a result, the environmental interventions selected were school/community gardens, a mobile farmers market, park (re)development, and the creation of greenhouses. To measure the success of interventions, various other tools were utilized such as key informant surveys, a sustainability assessment tool, harvest logs, and monthly reports.

Results: Significant environmental changes were seen in the community. The mobile farmers market reached 13,597 community members and sold approximately 86,415 lbs. of fresh produce in identified "food desert" areas. 12 school and community gardens were established, along with six walking trails and playscape areas. In support of these activities, community members donated approximately \$200,000 of in-kind contributions and over 10,000 service hours to the various gardens, trails, and park projects.

Conclusions: Starr County, TX will be used as a model and to help demonstrate select evaluation tools to measure project outcomes. Participants will be encouraged to use the resources and strategies provided for application in other communities with similar goals.

08.1.3

The association between school district nutrition policies and the neighborhood food environment: are different communities targeting different sectors?

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: Nutrition promotion policies in the United States focus largely on schools, but disadvantaged communities often have less healthy food access outside school. This study was designed to: 1) determine if school districts with stronger policies tended to have equal access to healthy foods near school, and 2) compare racial/ethnic and socioeconomic correlates of policy strength to those of neighborhood food access.

Methods: Data on competitive food policies and neighborhood food access were collected from school districts and food stores in 471 communities across the United States, 2010-2012. Strength scores from 26 individual policies were averaged to measure overall district policy strength (scale: 0-100). Quantities of fresh, frozen, and canned fruits and vegetables in stores near schools were measured via direct observation. We also analyzed the ratio of healthy to unhealthy items in stores ("relative healthy food availability"). Associations between food store measures and policy strength were estimated using linear, zero-inflated Poisson, and zero-inflated negative binomial models, adjusted for secular trends and stratified by grade (middle versus high school). Policy strength and food store measures were individually regressed on several racial/ethnic and socioeconomic community characteristics.

Results: In communities with stronger policies, local stores were less likely to have zero fresh fruits ($p < .01$) or zero fresh vegetables ($p < .001$), but also had a lower quantity of fresh vegetables, on average ($p < .05$). Associations were stronger near middle schools, where policy strength was also associated with less fresh fruit in stores ($p < .02$). Policy strength was not associated with canned or frozen fruits/vegetables or overall relative healthy food availability. Demographic and socioeconomic correlates of policy strength differed drastically from those of food store measures. Areas with a higher proportion of Hispanics, higher income disparity, and higher proportion of families with children in poverty tended to have stronger policies but stores with less healthy items.

Conclusions: Communities with healthier school nutrition policies tended to have fewer fresh fruits/vegetables near school. This does not imply causality but raises questions of whether neighborhood factors may limit policy effectiveness. Multi-sector initiatives are needed, particularly as school-based policies and neighborhood food access appeared to be driven by different social/economic factors.

08.1.4

Built Environment Influences on Healthy Eating and Active Living: a “NEWPATH” to Energy Balance

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: To apply an energy balance approach to explain obesity of adults across a range of income, age, and walkability levels. This approach involves simultaneously evaluating impacts of diet (energy in) and physical activity (energy out) on body mass index (BMI), and was made possible through the unique study design of the Neighbourhood Environment in Waterloo Region: Patterns of Transportation and Health (NEWPATH) study.

Methods: The sample for this study consists of 532 adults that participated in the NEWPATH study. Accelerometers were used to objectively measure physical activity, and food consumption data captured in a travel diary was used to calculate a Healthy Eating Index (HEI). Built environment supports for physical activity were captured using a Walkability Index, while those for healthy eating were gauged by Nutrition Environment Measures (NEMS) scores. Pathways from the built environment to behaviour (walking and eating) to BMI were simultaneously assessed using path analysis.

Results/Findings: Results indicate that walkability is a significant predictor of average daily minutes of moderate to vigorous physical activity ($\beta=0.114$, $p<0.01$), and BMI ($\beta=-0.129$, $p<0.01$). In contrast, the NEMS food environment measures neither significantly predict the HEI or BMI.

Conclusion: The results highlight the importance of walkability in influencing BMI. The finding that the food environment does not significantly predict BMI may be a result of limited environmental variability in the Waterloo Region. The NEWPATH study provides an innovative model for the integration of dietary, transportation, physical activity, built environment and body weight data that municipalities can use to create local evidence bases.

08.1.5

Using photovoice to explore social and financial influences of food choices in low-income New York City youth

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SIG: Yes, Policies and environments

Awards: No

Purpose: As dietary behaviors learned during childhood lay the foundation for habits practiced in adulthood, it is important to engage and empower youth around healthy food choices. Photovoice is a community-based participatory research tool, which has a theoretical underpinning in empowerment education theory. This methodology promotes active engagement by providing marginalized populations the opportunity to critically reflect and convey their concerns and experiences on health and justice issues. The purpose of this study was to explore the social and financial influences on food choices of youth residing in low-income urban neighborhoods and to better understand the challenges these youth face within their community and home food environment, utilizing photovoice.

Methods: Study participants were youth, who participated in a community-based food justice afterschool program in Fall 2013/ Winter 2014. The youth conducted a community food assessment to explore social and financial influences within their community and home food environment through photovoice assignments. Youth photos guided individual in-depth interviews. Inductive and deductive processes were used to identify codes (ideas emerging from text); similar codes were grouped into themes.

Results: 34 youth (11 males, 23 females; aged 10 to 14 years; predominantly Hispanic) from East Harlem, Washington Heights, and South Bronx, New York, comprised the study population. Preliminary analysis revealed three major themes: 1) Youth learned about food from their families by cooking and eating meals at home, and as a result of family members' health concerns, 2) Youth mentioned how they and their parents often choose less healthy foods as these foods are more accessible and affordable, and 3) To improve their food environment, youth made various suggestions such as changing the location of certain food products in supermarkets to encourage healthier choices and writing letters to food companies and policy makers.

Conclusions: Photovoice is a creative way to engage youth around healthy eating as it provides an opportunity for critical reflection and increased awareness of the influences and challenges low-income urban youth confront. These data could help to inform public health interventions aimed at improving the community and home food environments.

01.2. ORAL:

Environment and physical activity and sedentary behavior in youth

01.2.1

The School Physical Activity Environment: Relationship to MVPA and Academic Outcomes in Underserved Schoolchildren

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Competing demands, including academic requirements, have been cited as reasons for lack of physical activity (PA) opportunities in schools. The goal of this research was to assess school PA environment and its relationship to moderate-to-vigorous physical activity (MVPA) and standardized test scores.

Methods: Schoolchildren (n=449, grades 3-6) were recruited from 8 schools in a low-income, Hispanic community in Massachusetts. Demographic data were collected by parent report. Measured height and weight were used to calculate BMI z-score. Accelerometry was used to measure school-time and total daily MVPA. School physical activity environment (PAE) was reported by school personnel on a 10-item questionnaire addressing physical education, recess, before- and after-school programming, and classroom activity. Scores were median-split into high- and low-PAE for analysis. Associations between PAE on MVPA and achieving "proficient" or above in math and English were examined using mixed-effect models, appropriately controlled for grade, BMI-z, free/reduced price lunch status, sex, and maternal education.

Results: 358 participants (37.7% male; 10.1±1.2 years) had valid accelerometer wear time (≥3 days, ≥10 hr/day). Few met the 30-min school-time (10.9%; 16.7±10 min) or daily 60-min (15.9%; 39.8±21 min) MVPA recommendations; 61% and 48% scored proficient or higher on math and English, respectively. Although not statistically significant (p=0.285), we found a practically important 4.5 minutes more of in-school MVPA among boys in high-PAE schools compared to those in low-PAE. No difference was observed for girls. Children from high-PAE schools were more likely to achieve proficient or advanced in math (OR=2.36, p=0.003) but not in English (OR=1.20, p=0.54). Item-specific analysis revealed that being in a school that requires annual assessment of students' fitness was predictive of greater odds of children achieving proficient or above in both math (OR=1.91, p=0.052) and English (OR=2.17, p=0.001).

Conclusions: In an underserved school district with low PA and standardized test scores, trends suggest a positive association between high PA support and academic outcomes. The observation of the positive relationship between required fitness assessment and math and English test scores may indicate that school resources play a role in PAE. Longitudinal studies examining changes in the PA environment and academic success are needed.

01.2.2

Interrelation of Kernel Density Methods and Neighborhood Context in the Assessment of Environmental Opportunities for Physical Activity in Children.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Using kernel density methods and particularly adaptive bandwidths might reduce methodological limitations that typically occur when assessing opportunities for physical activity in the built environment. Moreover, physical activity may be affected by an uncertain geographical neighborhood context which also depends on individual characteristics such as age or sex. Thus, we simultaneously investigated the impact of different kernel approaches and multiple neighborhood distances on the association of urban measures and physical activity.

Methods: We assessed urban measures such as street connectivity, public transit density, and public open space density within individual network-dependent neighborhoods based on geographical data of one German study region of the IDEFICS study (www.ideficsstudy.eu). Urban measures were calculated based on kernel approaches with a fixed bandwidth, cross-validated bandwidths with circular or elliptical kernel functions, each with and without considering adaptive bandwidths adjusted for residential density. Additionally, we considered six network distances from 500m up to 2km for each measure. A log-gamma regression model was used to calculate the effect of each urban measure on accelerometer-based MVPA of 400 6- to 9-year old school children who participated in the IDEFICS study. Models were adjusted for age, BMI, education, safety concerns, season and valid wear time of accelerometers and were stratified for sex.

Results: Effect estimates and p-values of urban measures, as well as goodness of fit showed only small differences between kernel approaches, but strong differences between network distances. Though goodness of fit was relatively stable, p-values showed large discrepancies in distances and methods. For public open space density, best goodness of fit was found using an elliptical cross-validated bandwidth that is adaptive to the underlying residential density within a distance of 1,250m for both, girls and boys (boys: $\exp(\beta)=1.06$, p=0.054; girls: $\exp(\beta)=1.07$, p=0.007).

Conclusions: The use of a fixed predefined neighborhood context hides the true geographical context of subgroups of participants and of built environment characteristics. In particular, we found that identifying effects of urban measures strongly depends on the choice of the network distance. Kernel approaches allowed for more flexibility in modelling urban measures and improved the assessment compared to simple density methods.

O1.2.3

How far do young people walk to school from childhood to adolescence?

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SIG: Yes, Policies and environments

Awards: No

Objective: The aims of the current paper therefore are a) to study the association between objectively-measured distance from home to school and mode of commuting from childhood to adolescence; and b) to identify age-specific threshold distances below which young people are more likely to walk to school as opposed to using passive modes of transport.

Method: Participants from the SPEEDY study (Sport Physical Activity and Eating Behaviour: Environmental determinants in Young people) were invited to be measured on three separate occasions: at age 9/10 years (10y, April-July 2007), age 10/11 years (11y, April-July 2008) and age 13/14 years (14y, April-August 2011) at schools from the county of Norfolk, UK. Participants answered the mode of commuting to school at the three measurement times; the response options were: walking, cycling, car, bus or train. The objective measure of commuting distance to school was estimated using a Geographic Information System (ArcGIS 9.2, ESRI Inc) by calculating the shortest route via the street network between each child's home and the nearest school entrance. Data was studied using logistic regression analysis and the Receiver Operating Characteristic (ROC) curve, at all three time points.

Results: As expected, the percentage of children walking to school decreased with increasing distance ($p < 0.001$). The areas under the curve (standard error) were 0.872 (0.008), 0.891 (0.011) and 0.951 (0.011) (all $p < 0.001$) at 10, 11, and 14 years old respectively. The corresponding threshold distances were 1421m, 1627m and 3046m, respectively.

Conclusions: The threshold distance below which young people walk changes as they get older; from 1.4km at 10 years, 1.6km at 11 years to 3km at 14 years. Future interventions for increasing active modes of commuting to school should take into account these threshold distances.

O1.2.4

Objectively measured proximity to destinations is related to non-school physical activity in Hong Kong children

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: The physical activity (PA)-environment relationship may vary across countries/context. Existing evidence of such relationship among children in a dense Asian urban context is rare. This cross-sectional study aimed to examine the impact of proximity to various destinations on children's non-school PA in Hong Kong using objective measures.

Methods: Children's PA was measured by wearing an ActiGraph GT3X accelerometer. 403 children (Age = 10.6 ± 0.9 yr, Boy = 131) who provided valid accelerometry data for at least three weekdays were included in the data analysis; 250 of them provided accelerometry data for at least one valid weekend day. The average time (minutes/day) spent on moderate-to-vigorous PA (MVPA) on weekends (MVPA-WE) and during non-school hours on weekdays (MVPA-NS) was calculated based on Freedson's age-specific cut-off counts. Four proximity variables were determined using the geographic information systems, i.e. the nearest Euclidean distance from children's residential address to sports center, park/garden, recreational ground, and attended school. Linear mixed models were performed, separately for boys and girls, to investigate the associations between the proximity variables and MVPA, adjusting for potential confounders including age, body mass index, parental education, sports team membership, siblings, neighborhood household income, and neighborhood walkability.

Results: Boys and girls spent similar time in MVPA-NS (47.5 ± 17.9 vs. 47.2 ± 14.7 minutes/day, NS), while boys tended to be more active than girls on weekends (87.8 ± 44.4 vs. 77.7 ± 31.3 minutes/day, $p = 0.08$). After controlling for the confounders, distance to attended school was positively associated with MVPA-NS in both boys ($b = 12.43$, 95%CI = 5.23, 19.63) and girls ($b = 3.20$, 95%CI = 0.75, 5.65); whereas distance to sports centre was negatively ($b = -21.81$, 95%CI = -43.57, -0.05) and distance to recreational ground was positively ($b = 17.36$, 95%CI = -0.02, 34.74) related to MVPA-WE only in boys.

Conclusions: The findings of this study partially confirm that the built environment in a dense Asian urban context may influence children's PA differently compared to Western countries, e.g., further distance to attended school may foster children's PA during non-school hours.

01.2.5

Using the built environment to increase physical activity among obese adolescents.

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SIG: Yes, Policies and environments

Awards: No

Objective: Prior pediatric physical activity interventions have had limited success, increasing physical activity by only 4 minutes on average. In searching for ways to increase physical activity, the built environment (BE) has been less studied. Using the BE to increase moderate-to-vigorous physical activity (MVPA) has several promising aspects including no/low cost, potential for daily use, and potential for learning lifelong healthy habits. The objective was to test an intervention that leverages information on how adolescents use their BE in order to promote increased MVPA.

Methods: From October 2013-October 2014, overweight and obese 10-16 year olds were recruited from a community health center and sequentially assigned to intervention or control. In both groups, objective physical activity (accelerometer) and location (GPS) data were collected over 1 week at baseline(B), 1 week post-intervention(P1), and 3 months post-intervention(P2). Intervention subjects were informed of their baseline daily MPVA and given maps detailing the locations of their physical activity and their surrounding BE. Using the maps, youth in the intervention group were counseled by a pediatrician on ways to use the surrounding BE to increase their physical activity, followed by weekly booster phone call and text-message reminders. Control subjects were told their daily MVPA and received standard of care lifestyle modification counseling. Outcomes were change in mean daily MVPA (B to P1 and B to P2).

Results: Of 125 eligible subjects approached, 60(48%) were enrolled; intervention and control subjects had similar age, sex, BMI, and baseline MVPA. To date, 39 subjects have completed B and P1 assessments, 31 of whom have completed P2. At P1 median change in mean daily minutes of MVPA was +13.9 for intervention subjects compared to +1.1 among controls, $p < 0.0001$. Median change in mean daily MVPA remained greater among intervention subjects at P2 (intervention=+9.9 vs control=+1.0, $p = 0.03$).

Conclusions: These preliminary data suggest that using youth-specific information to teach overweight and obese adolescents how to use their surrounding BE increases physical activity levels. These findings show a significant increase in physical activity compared to published intervention studies, with gains sustained at 3 months. Using the BE to increase physical activity shows promise.

01.2.6

Spatial Analysis of Crime Incidence and Adolescent Physical Activity

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Adolescents do not achieve the recommended levels of physical activity. Crime is believed to be a barrier to physical activity among youth, but findings have been inconsistent. Prior studies have relied on proxy measures of crime including census level data, spatial buffers zones around the home, or self-reported safety, and have not accounted for the precise locations where physical activity actually occurred. This study compares the spatial distribution of crime incidences and moderate-to-vigorous physical activity (MVPA) among adolescents using Geographic Information Systems (GIS) and examines the correlation between crime and MVPA.

Methods: 74 participants in greater Boston ages 11-14 years provided objective physical activity (accelerometer) and location (Global Positioning Systems) data collected over two separate weeks. Contemporaneous crime report data were obtained from the city police department. Both crime and physical activity locations were geocoded using GIS. Using kernel density estimation, we calculated crime and MVPA densities, identified "hot spots" (locations with high densities) and "cold spots" (locations with low densities) of crime and physical activity, and divided visited locations into quartiles by crime density. Spearman's correlation tested for associations between crime and MVPA.

Results: Overall, there were 1694 reported crimes, including 52 robberies, 418 aggravated assaults, 148 intimidations, and 526 destruction/vandalisms, all successfully geocoded. Participants were 43% male, 39% White, 22% Black, and 38% Hispanic. 87% of subjects' MVPA data points fell within city boundaries and were included in analyses, totaling 16702 minutes of geocoded MVPA. A strong positive correlation was present overall between crime and adolescent MVPA ($P = 0.76$, $p < 0.001$). Crime remained positively associated with MVPA in locations falling within the lowest quartile ($P = 0.65$, $p < 0.001$) and highest quartile ($P = 0.50$, $p < 0.001$) of crime density.

Conclusions: This study found a strong positive association between crime and adolescent MVPA, despite prior research suggesting neighborhood crime may inhibit physical activity. This counterintuitive finding may be explained by the logic of a common destination: neighborhood spaces which are desirable destinations and promote physical activity may likewise attract crime. Future research should aim to understand whether neighborhood-level and individual-level characteristics mediate the relationship between crime and physical activity.

O2.2. ORAL: Food policy, environment and marketing

O2.2.1

TRANSFORMING THE 'FOODSCAPE': A SYSTEMATIC ASSESSMENT OF OUT OF HOME FOOD OUTLET (OHFO) INTERVENTIONS IN ENGLAND

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

Eating out of the home is increasingly common and contributes approximately 10% of total energy intake. These foods are usually high in energy, fat and low in micronutrients; therefore out of home food outlets (OHFOs) are an appropriate target for interventions to tackle obesity. A systematic search and documentation of the range, and any evaluations of OHFO interventions completed, ongoing or planned in England was conducted.

Methods:

Academic, UK trial and research, grey literature, and media databases, UK internet pages and relevant websites were searched (using relevant keywords) for reports published since 1993. All 355 councils in England were contacted and enquiry email messages seeking key information about interventions were directed to appropriate individuals. Relevant professionals were targeted via email and news bulletins. Information was also requested using social media. Information received was screened to identify interventions that met inclusion criteria. A data extraction form was completed by researchers and sent to the organisation responsible for the intervention to check accuracy and completeness.

Results:

The searches identified 102 interventions. For 75 interventions, further information was obtained; for 27 interventions no further information could be obtained. Fifty one 'award scheme' interventions (usually multi-category) and 32 'non-award scheme' interventions (focus on single items or outlets e.g. salt, children's menus, sandwich shops, Indian takeaways) were identified across a broad range of OHFOs. The majority of interventions were delivered by local government environmental health officers. Details about set-up and running costs were limited. There were 51 interventions with some form of evaluation information and 37 had outcome evaluation results. The majority of evaluations utilised only post project measures. Evaluations used a range of approaches however most focused towards the acceptability of the intervention to OHFOs rather than to customers. Evaluations highlighted the need for a cost neutral intervention (to the outlet). Additionally, they recognised the need for a significant investment of time on behalf of the intervention deliverer.

Conclusions:

A broad suite of interventions were identified but 'award schemes' were most prevalent. This evaluation evidence suggests that while delivering interventions in OHFOs requires significant commitment, OHFOs have the potential to provide healthier options.

O2.2.2

The effect of 20% price discount on fruit and vegetables combined with a space management intervention on supermarket purchases during a three month period

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Price discounts and space management interventions in supermarkets are frequently cited as a promising intervention opportunity to stimulate fruit and vegetable (F&V) purchases. Nevertheless, experimental evidence from real life settings is limited. The purpose of this study was to examine the effects of a 20% discount on F&Vs combined with a space management intervention or a space management intervention alone on supermarket purchases.

Methods: The present study is a part of the SoL Project which is a community-based multi-component intervention study to promote healthier eating and physical activity among children aged 3-8 years and their families living in three local communities on the island of Bornholm, Denmark. The design was a quasi-experimental design, including a matched intervention and control group. As part of this multi-component intervention, a coordinated space management intervention to promote F&V sales was performed in two large discount supermarkets ("placement"). In addition a 20% price discount on fruit and vegetable was introduced for three months in one of the supermarkets ("placement + price"). The effect was evaluated using sales data on all fruits and vegetables sold from all supermarkets from the same supermarket chain on Bornholm before, during and after intervention. Data was analysed using multi-level analyses.

Results: The sale of fresh vegetables was increased by 20.3% (P=0.037) during the intervention period in the "placement+price" intervention supermarket compared to the control supermarkets. In the "Only placement" intervention supermarket the sale of fresh vegetables increased by 11.9%, but non-significantly (P=0.142) compared to the control supermarkets. Sale of fresh fruits increased by 28.9 % (P=0.02) in the "placement+price" supermarket during the intervention period but compared to the control group the increase was non-significantly (P=0.11). In the "placement only" supermarket sale of fresh fruits increase non-significantly with 12.1% (P=0.28) compared to the control supermarkets.

Conclusions: Sales of fresh vegetables increased significantly during the intervention period and the most effective intervention was a combination of price discount and space management to promote sales of vegetables. There was a tendency of an increase in the sale of fresh fruit too but the effect was less clear.

O2.2.3

Attitudes towards food advertising and association with consumption of energy-dense, nutrient poor foods among adolescents in the United States

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Background: Billions of dollars are spent each year on marketing foods and beverages to adolescents. Efforts are underway to mitigate this marketing; however, few studies have examined adolescent attitudes towards food advertisements and how they relate to consumption of energy-dense, nutrient poor (EDNP) foods.

Objective: This study examined the association between attitudes towards food advertisements and consumption of EDNP foods among adolescents in the United States (US).

Methods: Data were from the US National Cancer Institute's national web-based Family Life, Activity, Sun, Health and Eating Survey (2014), collected from 1,693 adolescent-parent dyads. The following analyses were conducted on the adolescent data (n=1510): descriptive statistics, chi-square tests, and logistic regression models to assess correlates of consumption of EDNP foods. Consumption of EDNP foods were assessed through self-report and dichotomized (consumed/did not consume in the past week). Attitudes towards food advertisements were assessed through items on preferences for and the perceived taste of advertised foods and trust in food advertisements.

Results: Adolescents generally reported wanting to try advertised foods (60%), thinking advertised foods would taste good (63%), but not trusting food advertisements (37%). Controlling for age, sex and race/ethnicity, adolescents who disagreed vs. agreed that: they wanted to try advertised foods had significantly lower odds of consuming soda (OR 0.55, 95%CI 0.41-0.75), sugary cereals (OR 0.56, 95%CI 0.42-0.76), and chips (OR 0.43, 95%CI 0.31-0.59) in the past week; advertised foods would taste good had significantly lower odds of consuming soda (OR 0.53, 95%CI 0.38-0.75), sugary cereals (OR 0.47, 95%CI 0.33-0.66), and chips (OR 0.34, 95%CI 0.23-0.48) in the past week; they trusted food advertisements had significantly lower odds of consuming soda (OR 0.70, 95%CI 0.53-0.94), sugary cereals (OR 0.56, 95%CI 0.42-0.73), and chips (OR 0.40, 95%CI 0.28-0.57) in the past week.

Conclusions: Adolescents who disagreed with statements about wanting to try advertised foods, thinking advertised foods would taste good, and trusting food advertisements were less likely to have consumed EDNP foods in the past week than those who agreed with these statements. Findings emphasize the role of attitudes towards food marketing as a correlate of dietary behavior and the need to cultivate advertising literacy among our youth.

O2.2.4

Changes in Australian school food policy, community attitudes and consumption

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SIG: Yes, Policies and environments

Awards: No

Purpose: Meals bought from home and school canteens supply Australian children's school lunches. Government commitment to improve nutrition led to a traffic light system mandating the sale and provision of healthier foods in schools since 2007. The purpose of this presentation is to demonstrate changes in community support for school food policy to improve diet among Western Australian (WA) children, and changes in consumption.

Methods: Pooled data from six population-based Nutrition Monitoring Surveys collected between 1995 and 2012 yielded 7,044 adults aged 18-64 years. Views on who should choose the foods sold in school canteens were examined along with attitudes regarding the restriction of sales of high fat foods. The Child and Adolescent Physical Activity and Nutrition Survey collected 24 hour food diaries from children attending 19 primary schools and 17 secondary schools across WA in 2003 (n=1625) and 2008 (n=1413). Foods consumption and sources before and after policy introduction were examined. Descriptive and logistic regression analyses of data sets were conducted.

Results: Community attitudes toward who should decide foods sold in canteens and the restriction of unhealthy alternatives changed over time. More respondents (58%) said parents should decide the type of food sold at school canteens, but since 2004, the proportion citing the Health and Education Departments increased significantly (p<0.001). Strong community agreement with restricting sale of high fat foods peaked at 72% in 2009, after policy change.

Between 2003 and 2008 the proportion of 'green' items purchased from school canteens increased from 29% to 41%, 'amber' items increased from 23% to 31% and 'red' items decreased from 48% to 28% (p<0.001). For several food groups the proportion of total intake sourced from school canteens decreased significantly between study years, especially in primary schools. These included fatty convenience foods, ice cream, fried chips and confectionary.

Conclusions: Findings suggest that school food policy changes have the potential to influence community attitudes and dietary intake. Community support for government control of the food for sale in school canteens has increased since mandated food traffic light policy in schools. There is also evidence that dietary intake of canteen users has improved.

02.2.5

Fat tax and all that: The pros and cons of taxing food

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SIG: Yes, Policies and environments

Awards: No

Objective: Taxes and subsidies on food are receiving increasing attention internationally as potential interventions to reduce morbidity and mortality from obesity. However, little is currently known about policy makers' views regarding the feasibility and acceptability of such initiatives, a gap this study aimed to address.

Methods: Using epidemiological modeling, the SPEND study quantified the effects of targeted food taxes and subsidies on population total food intake, health, and nutrition-related disease in New Zealand. The current study took these findings to 20 key stakeholders to determine the feasibility and likely acceptability of selected food taxes and subsidies, including taxes on saturated fat, salt and soft drinks. Interviews were conducted with politicians, bureaucrats, and food industry and consumer representatives. Interviews were taped, transcribed and analysed using thematic analysis.

Results: Results indicated that demonstrable evidence, such as that provided by the modeling, was critical in assisting policy makers to support such initiatives. The broader political and economic context was also a major influence. A significant portion on New Zealand's wealth is derived from dairy production. This makes consideration of a fat tax more complex in New Zealand than in countries where this is not the case.

Conclusion: It is concluded that epidemiological modeling is a constructive way to engage policy makers in discussion about food taxes and subsidies. It enables the pros and cons of taxing food to be determined and it enables public health experts to develop more effective advocacy strategies with the evidence this approach generates.

03.2. ORAL: Behavior change theory

03.2.1

SPORT EDUCATION: INCREASING AUTONOMY AND COMPETENCE DURING PHYSICAL EDUCATION

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: To investigate the effect of Sport Education (SE) on students' perceived competence, autonomy, relatedness and motivation for Physical Education (PE) during a 10-lesson endurance running and fitness unit. SE is an instructional model where students cooperate in heterogeneous groups to maximize each other's learning (Siedentop, Hastie & Van der Mars, 2011). Previous research showed that SE can positively impact students' motivation during PE (Wallhead, Hagger, & Smith, 2010), which in turn could lead to physically active behaviour outside the school (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003).

Methods: Three PE teachers (female, age 31-52 years) each taught three different 10-lesson units of running and fitness to three different classes. The nine classes were randomized per teacher. In the three control classes, teachers taught their regular running and fitness content. In the three content knowledge classes, teachers taught lesson content specifically developed to promote extramural running and fitness. The three SE classes were similar to the content knowledge classes except that the teacher delivered this content through the SE model. Before and after the 10-lesson unit all students (n=168) completed a questionnaire on their basic need satisfaction and intrinsic motivation to engage in PE (BREQ-II, Markland & Tobin, 2004).

Results/findings: SE students reported a significantly higher autonomy, $F(2, 129)=4.9$, $p<.01$, and competence, $F(2, 129)=4.3$, $p=.02$ compared to the other groups. For intrinsic motivation and relatedness, no significant differences were found.

Conclusions: The SE unit increased pupil's basic needs for autonomy and competence. Further research could investigate whether this increased perceived autonomy and competence could lead to higher levels of intra- and extramural physical activity in the long run. Also, the effect of longer SE units could be investigated on students' basic needs satisfaction and physical activity behaviour.

O3.2.2

Autonomy supportive youth sport environments and associated adaptive motivational processes are related to lower levels of adiposity among male and female youth sport participants

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: Research grounded in self-determination theory has demonstrated the role autonomy supportive social environments may play in predicting the quality of motivation and responses of youth as well as promoting higher levels of PA engagement within the activity at hand. The aim of the present study was to determine whether the social environment created within youth sport is related to variability in motivation, enjoyment, daily levels of PA engagement and in turn, levels of adiposity among children active in the youth sport context.

Methods: One hundred and sixteen youth sport participants (64% male) representing football (N = 66) hockey (N = 19) and netball (N = 31) completed multi-section questionnaires assessing perceptions of the social environment created by their youth sport coach, self-determined motivation towards their sport engagement, and sport-related enjoyment. Body composition was assessed via bio-electrical impedance analysis (Tanita SC330), and objectively assessed levels of PA engagement were determined via 7 days of physical activity monitoring using accelerometers (GT3X).

Results: Path analysis supported a model in which perceptions of coach provided autonomy support were positively associated with autonomous motivation ($\beta = .58, p = <.01$). Autonomous motivation positively predicted sport-related enjoyment ($\beta = .61, p = <.01$), which in turn, was positively related to daily MVPA (min/day) ($\beta = .19, p = <.05$). Participants' daily MVPA negatively linked to percent body fat ($\beta = -.48, p = <.01$). The hypothesized model demonstrated a good fit to the data ($X^2(14) = 18.16, p = .20, CFI = .97, RMSEA = .05, SRMR = .07$). All analyses were adjusted for accelerometer wear time and participant age.

Conclusions: Present results indicate the coach created social environment in youth sport and associated levels of PA engagement, may have implications for adiposity status of youth sport participants. Specifically, fostering more autonomy supportive youth sport environments may contribute towards the prevention of overweight and obesity among youth active in this context, through encouraging higher habitual levels of PA engagement.

O3.2.3

Self-Efficacy Moderates the Effect of an Online Physically Active Possible Selves Intervention on Reported Physical Activity Levels

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: Possible selves are individuals' conceptualizations of what they could become in the future (Markus & Nurius, 1986). Interventions targeting *physically active possible selves* can increase physical activity (e.g., Murru & Martin Ginis, 2010). Factors that moderate the effectiveness of physically active possible selves interventions need to be identified. Self-efficacy, or people's perceived ability to engage in behaviors required by a specific situation (Bandura, 1997), may be one such moderator. Given the positive influence of self-efficacy on physical activity (McAuley, Mailey, Szabo & Gothe, 2013), the effectiveness of a physically active possible selves intervention may be enhanced for individuals who feel self-efficacious about physical activity. This study examined whether adults' self-efficacy for physical activity moderated the effect of a physically active possible selves intervention on physical activity.

Methods: Participants in this online, randomized, controlled study were 244 insufficiently active adults who were assigned to one of two physically active possible selves conditions (self-enhancing; self-regulatory) or a control condition. Participants in the self-enhancing possible selves condition imagined themselves in the future as a physically active person. Participants in the self-regulatory possible selves condition considered this same image as well as steps to pursue this possible self. Participants in the control condition read physical activity guidelines. All participants completed self-efficacy and physical activity measures at baseline, and two, four and eight weeks afterwards.

Results/findings: Multilevel modeling for repeated measures data revealed that a moderation model provided the best fit to the data as the BIC was lower compared to a model without self-efficacy (mean difference = 39.59). Higher levels of self-efficacy enhanced the positive effects of both possible selves intervention conditions. Regions of significance analyses showed that physical activity levels increased as self-efficacy increased for participants in either of the intervention conditions who had moderate or higher self-efficacy levels.

Conclusions: Findings suggest that physically active possible selves interventions may be most effective for adults who feel self-efficacious to engage in physical activity. However, even adults with low efficacy may benefit from this intervention if efforts are made to enhance their self-efficacy prior to or as part of the possible selves intervention.

O3.2.4

A Test of Social Cognitive Theory to Explain Physical Activity Changes in a Weight Loss Program for Men

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Physical inactivity and obesity are leading contributors to the burden of disease in men. Social-cognitive theories may improve physical activity (PA) and weight loss interventions by identifying which variables to target to maximise intervention impact. Although Social Cognitive Theory (SCT) is a widely researched model in the PA domain, the evidence base is limited by a reliance on: i) cross sectional data, and ii) multiple regression analyses (which cannot examine the indirect or total effects specified in SCT). Further, few models have included all core SCT constructs and most are generated from predominantly female samples. Thus, the objective of this study was to test the utility of the full SCT model to explain the PA changes of men during a weight loss program.

Methods: Participants were 204 overweight/obese men (mean (SD) age: 46.6 (11.3) years; BMI: 33.1 (3.5) kg/m²) who enrolled in a weight loss study. All men received the validated *SHED-IT Weight Loss Program*, which is a self-administered, SCT-based program specifically designed for men. A longitudinal, latent variable structural equation model tested the associations between SCT constructs (i.e. self-efficacy, outcome expectations, goal, & social support) and self-reported MVPA (Godin GLTEQ) and examined the total PA variance explained by SCT. A cross-lagged model structure was employed where cognitions and PA at 3 months (Time 2; post-test) were controlled for baseline values (Time 1; baseline).

Results: The fit indices indicated that the proposed model provided a good fit to the data ($\chi^2 = 59.3$, $df = 24$, $p < 0.001$; Normed $\chi^2 = 2.47$; CFI > 0.95 ; SRMR < 0.06). Overall, SCT explained 61% of the variance in PA changes during the intervention. All of the hypothesised pathways from cognitions to PA were supported, except for the direct effect from outcome expectations. Changes in self-efficacy demonstrated the largest direct and total effects on PA change ($\beta_{\text{direct}} = 0.44$, $p < 0.01$; $\beta_{\text{total}} = 0.64$, $p < 0.01$).

Conclusions: This study provides evidence supporting the tenets of SCT when examining PA behaviour change in overweight men attempting weight loss. Future PA interventions for men may benefit by specifically targeting the constructs described in SCT.

O3.2.5

Gaining insight into the association between motivation and physical activity: An illustration of the of polynomial regression analysis

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: Organismic integration theory has been one of the most influential frameworks used to investigate the association between people's motivation and their behavior within the physical activity (PA) domain. Researchers have argued that there are two types of motivation [*autonomous motivation* (AM) and *controlled motivation* (CM)], and that AM will positively influence PA, whereas CM will negatively influence PA. We suggest that a better understanding of the effects of these motivations can be obtained by using an analytical framework that captures both the degree of agreement/differentiation between AM and CM and the levels of AM and CM. Therefore, we aimed to demonstrate the capabilities of polynomial regression analysis with response surface methodology to examine how AM and CM as separate constructs, as well as how the degree of agreement/differentiation and the direction of differentiation among them, can predict PA planning and goal progress in university students and PA levels in breast cancer survivors.

Methods: We used data drawn from a longitudinal study with university students ($n=214$), and another one with breast cancer survivors ($n=180$). Motivation, PA planning and goal progress were assessed by questionnaires. PA levels were assessed by accelerometers. Data were analyzed using polynomial regression analysis with response surface methodology

Results: Based on the regression analyses, AM was associated with all outcomes. CM was not associated with any of the outcomes. Based on the response surface values, PA planning and levels were higher when AM was greater than CM and as agreement between AM and CM increased.

Conclusions: While other variable-centered analytical approaches using AM and CM scores or a combined AM-CM lack the ability to answer questions relating to both the degree of agreement/differentiation between AM and CM and the levels of AM and CM, polynomial regression analysis with response surface methodology can help answer these questions and offer more insight into the effects of motivation. Considering the degree of agreement and the direction of differentiation between AM and CM adds to the interpretation of the associations between motivation and PA outcomes that is not captured by simply using AM and CM scores or a combined AM-CM score.

03.2.6

A latent profile analysis of goal content in exercise

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

Drawing from Self-determination theory, the main aim is to examine if there are different homogenous subgroups of people with similar latent profiles (that differ from other subgroups) regarding goal content in the exercise domain.

Methods:

Active members (n=1084) of an internet-based exercise program between 18 and 78 years of age (279 men and 805 women) completed a web survey including the *Goal Content for Exercise Questionnaire* (GCEQ; Sebire, Standage & Vansteenkiste, 2008). The five variables measured by the GCEQ, social affiliation (SA), health management (HM), skill development (SD), social recognition (SR) and image (IM) were used as input variables in latent profile analysis (LPA) in Mplus. Variables related to Self-determination theory, basic psychological needs and motivational regulations, as well as exercise behavior were used as distal outcome variables.

Results:

A five class model constituted the most statistically suitable and theoretically meaningful solution. Class 1 score low on all GCEQ five variables. Class 2 also scores relatively low on all variables aside from HM which was average. Class 3 is primarily driven by high scores on the external goals IM and SR. Class 4 show a reversed profile compared to class 3 with high scores on SA and SD and IM and SR being below average. Finally class 5 display high scores on all variables, in particular on SA, SR and SD. The five classes also differed in terms of distal outcome variables linked to the self-determination theory, such as basic psychological need satisfaction, motivational regulations and exercise behavior.

Conclusions:

Several unique latent profiles of goal content in exercise were detected. Significant differences across these latent profiles in basic needs, motivational regulations and exercise behavior were also found. Person-centered analyses, such as LPA, may reveal interesting patterns of complex interactions that are hard to identify using traditional variable centered analyses.

04.2. ORAL:

Nutrition and physical activity interventions

04.2.1

Your Health Matters! A community-wide campaign to increase physical activity and healthful food choices among individuals of Mexican descent

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SIG: Yes, Policies and environments

Awards: No

Objective: Widely disseminated evidenced-based interventions could improve minority health outcomes. However, they are underutilized. Guidance is lacking on whether interventions tailored for a sociocultural fit to a population remain effective. We examined elements of a community-wide campaign tailored by community-based participatory research, and the association with increased levels of physical activity and healthy food choices. This intervention was implemented in a city along the US-Mexico border. The intervention uses Social Cognitive Theory and Transtheoretical Model processes of change as its theoretical foundation.

Methods: A cross-sectional sample of 1,438 participants was drawn from a randomly-selected cohort of primarily Mexican descent adults, living along the US-Mexico border. Participants were recruited between 2008 and 2011 to examine a dose-response relationship between exposure to components of a community-wide campaign and behavioral outcomes. The two outcomes measured include meeting U.S. physical activity guidelines of greater than 600 MET-adjusted minutes and meeting recommended daily portions of fruits and vegetables. The community-wide campaign components specifically examined include exposure to mass media and community health worker outreach initiatives.

Results: After controlling for gender, age, marital status, educational attainment, preferred language, diabetes, and health insurance, the strongest association was found between meeting physical activity guidelines and exposure to campaign health worker discussions in combination with exposure to radio messages (adjusted OR=3.83; 95% CI= [1.28, 6.21]; p=0.0099). Participants who were exposed to community-wide campaign radio and TV consumed more portions of fruits and vegetables than those who were not exposed (adjusted RR=1.30; 95% CI= [1.02, 1.66]; p=0.0338).

Conclusion: Exposure to components of the community-wide campaign made culturally and contextually relevant with community-based participatory research strategies was associated with increases in physical activity and healthy food choices.

O4.2.2

Fathers' parenting practices mediate changes in children's dietary and physical activity behaviours: findings from the Healthy Dads, Healthy Kids community randomised controlled trial

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective: To examine potential paternal parenting-related mediators of children's physical activity and dietary behaviour change in the Healthy Dads, Healthy Kids (HDHK) community program.

Methods: A randomised controlled trial was conducted with 45 overweight/obese (mean [SD] age=39.8 [5.4] years; BMI=32.4 [3.8]) fathers and their children (n=77; 58% boys; mean [sd] age=7.7 [2.5] years). Families were randomised to either (i) HDHK program or (ii) a wait-list control group. The program involved seven sessions. Fathers and their children were assessed at baseline and at 14-weeks for physical activity (pedometry) and core food intake (Questionnaire). Fathers' lifestyle-related parenting practices included; efficacy, beliefs, modelling, logistic support, rules, co-physical activity, shared mealtime frequency and intentions.

Results: Significant intervention effects were found for co-physical activity and modelling physical activity. Co-physical activity mediated children's physical activity in the intervention ('mediated effect', AB=653, 95% CI=4 to 2050) and was responsible for 59.5% of the intervention effect. Fathers' beliefs mediated children's percent energy from core foods (AB=1.51, 95% CI=0.05 to 5.55) and accounted for 72.9% of the intervention effect.

Conclusions: Participation in the HDHK program positively impacted on fathers' co-physical activity with their child and beliefs about healthy eating which mediated changes in children's diet and physical activity behaviours.

O4.2.3

Randomized trial of a family-based obesity prevention intervention that embeds weight-related messages within a general parenting program: The Parents and Tots Together Study

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SIG: Yes, Children and families

Awards: No

Purpose: Formative research shows that parents of young children are enthusiastic about learning general parenting skills, but less interested in nutrition and physical activity. The objective of this randomized controlled trial was to evaluate the effectiveness of Parents and Tots Together, a family-based obesity prevention intervention that embeds weight-related messages within a general parenting program among a sample of racial/ethnic minority families with children age 2 to 5 years.

Methods: We randomized 56 families to the Parents and Tots Together intervention and 56 to a minimal attention control. Children were primarily Hispanic (59%) or Black/African American (22%). The intervention included: 1) 9, weekly group parenting sessions, 2) a children's program, and 3) weekly homework assignments. At baseline, post-intervention, and 9-month follow-up, trained staff assessed children's weight and height. Parents completed surveys assessing parenting skills, feeding behaviors, and children's diet, activity, and TV viewing patterns.

Results: At 9-month follow-up, BMI decreased by a mean of 0.13 kg/m² among children in the intervention arm and increased by 0.21 kg/m² among children in the control arm (difference = -0.36; 95% confidence interval [CI] -1.23, 0.51; P = 0.41). Parents in the intervention decreased restrictive feeding practices relative to control parents (-0.30; 95% CI -0.53, -0.07; P = 0.01). Intervention and control arms showed similar changes in children's television viewing, physical activity, sleep, and sugar-sweetened beverages.

Conclusion: After 9 months, the Parents and Tots Together intervention improved feeding behaviors among parents of preschool children, but did not improve children's BMI, diet, activity, sleep, or sedentary behaviors.

O4.2.4

Texas GROW! EAT! GO! Using Family-focused Garden, Nutrition and Physical Activities to Prevent Childhood Obesity: Cohort 1 results

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SIG: Yes, Children and families

Awards: No

Purpose: The Texas! Grow! Eat! Go! (TGEG) Study is a 5-year school-garden and nutrition and physical activity intervention study targeting childhood obesity among 3rd grade students enrolled in 32 low-income schools in Texas.

Methods: Using a randomized controlled trial design with four treatment groups, this study assesses the independent and combined effects of two school-based interventions: a school-garden and nutrition program, Learn! Grow! Eat! Go! (LGEG), and a physical activity program, Walk Across Texas (WAT), on children's diet and physical activity behaviors and body mass index (BMI). The four treatment groups consisted of: 1) Control condition, 2) LGEG only, 3) WAT only, and 4) LGEG and WAT combined. Data collected from children and parents include behavioral outcomes (i.e., dietary intake, physical activity, sedentary behaviors and gardening), psychosocial variables related to these four behaviors, knowledge, demographics, and child body mass index (BMI). Process evaluation data was collected from teachers, parents, school administrative staff and Extension agents. The intervention was implemented in two waves and results from cohort 1 are presented.

Results: Sixteen low-income schools (n=734 children; 560 parents) participated in the first wave. Children were ethnically diverse (45.63% Hispanic, 18.79% African American) and mostly low-income (78%). Forty-three percent of children lived in food insecure households. Cognitive and behavioral changes in the combined LGEG and WAT group included: significant increases on vegetable exposure (p<.0001), vegetable preference (p<.001); decreased screen time (p<.001); increased moderate (p<.0001) and vigorous physical activity (p<.001); and increased healthier beverage choices (p<.01). Parents showed significant increases in support for children to eat healthy (p<.05), encouragement for children to eat vegetables (p<.05), parental interaction related to healthy eating (p<.05). Parents reported engaging in a variety of ways with TGEG including: talking to their child about their school garden (81%), receiving TGEG materials from school (56%), and reading (60%) and preparing recipes (30%) brought home by child.

Conclusion: Significant changes were found in several cognitive and behavioral outcomes in children and parents. However, no significant changes in BMI were detected. Discrepancies in classroom implementation fidelity across treatments underscores a need for further analysis to determine actual impact of the interventions.

O4.2.5

The Delta Garden Study: Addressing Child Health and Academic Achievement through School Gardens

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The Delta Garden Study (DGS) is a science-based school garden intervention designed to increase fruit and vegetable (FV) intakes and minutes of moderate to vigorous physical activity (PA), as well as to improve academic achievement and reduce social risk behaviors, in middle school students in Arkansas. The evidence from previous school garden studies is limited by small sample sizes, convenience samples, and a lack of controls. DGS improves the evidence base through rigorous design, including controlling for the effects of clustering.

Methods: We used a quasi-experimental, cross-sectional, nested, pair-matched design utilizing 6 intervention (school garden) schools and 6 control (no school garden) schools, including over 2,000 6th, 7th and 8th grade students nested within 4-6 science teachers per school. Control schools were matched with intervention schools based on percent African American student enrollment, percent eligibility for free and reduced price meals, and percent of overweight and obese students (\geq 85th age and gender adjusted BMI percentiles). Each intervention school received a 1-acre garden, including greenhouse, and a study-funded Garden Manager, for one school year. The corresponding study-developed curriculum was aligned to the state educational frameworks for 6th-8th grade science, math, literacy, and health. The active intervention was one full academic year. FV intakes and PA were measured by self-report questionnaire (average of 2 days at each time point). The science knowledge test used questions from standardized science benchmark exams.

Results: Intervention students significantly increased their FV intakes by at least ¼ c per day from baseline to final time point compared with controls (p=0.0033), as well as their science test scores (I = 26.24 correct answers vs. C = 23.28 correct answers; p=0.0424). Changes from baseline to final time point in PA were not significant between I and C students (p=0.2132), nor for social risk as measured by school bonding questionnaire (p=0.9935). All p values are adjusted for race and school meal status.

Conclusions: DGS provides a strong evidence base for using school gardens implemented through core curricula (e.g. science) to positively impact academic achievement and health behaviors, specifically increasing FV intakes, in middle school children.

04.2.6

LA Sprouts: A school based gardening, nutrition, and cooking program reduces obesity and related metabolic disorders in Latino youth

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SIG: Yes, Children and families

Awards: No

Purpose: To evaluate the effects of 12-week gardening, nutrition, and cooking randomized controlled trial (RCT) on dietary intake, determinants of dietary intake, and obesity and metabolic parameters.

Methods: Three hundred and twenty, primarily Latino children (3rd-5th grade), were randomized to either LA Sprouts (n=173) or Control (n=147; delayed intervention). LA Sprouts participants received a school garden and 12 weeks of weekly 90-minute culturally tailored gardening, nutrition, and cooking classes, which were taught during the after-school program. Data collected at baseline and post intervention included dietary intake via a food screener, dietary determinants of behavior via questionnaires, anthropometric measures (height, weight, BMI, and waist circumference), body fat via bioelectrical impedance, fasting blood samples to measure lipids, insulin, glucose, and the metabolic syndrome was calculated.

Results: LA Sprouts compared to control participants had increases in dietary fiber, vegetable intake and whole grains and improvements in the ability to identify vegetables, self-efficacy to eat fruits and vegetables (FV), motivation to cook FV and nutrition and gardening knowledge. LA Sprouts compared to control participants had significantly greater reductions in BMI z-scores (0.09 versus 0.04 decrease, respectively; p=0.01) and in waist circumference (-1.2 cm vs. non change; p<0.001). Fewer LA Sprouts participants had MetSyn after the intervention than before, while the number of controls with MetSyn increased.

Conclusion: This is the first garden-based RCT to result in improved dietary intake and decreased obesity and metabolic disease risk in high-risk Latino youth. These findings suggest that teaching children to grow, cook, and eat FV not only provides access and availability of health foods to low-income children but reduces their disease risk.

05.2. ORAL:

Food and nutrition in adolescents

05.2.1

Trajectories of eating behaviors over four years in a nationally-representative cohort of U.S. adolescents overall and by baseline weight status

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: To examine trajectories of, and associations among, eating behaviors of contemporary American youth from age 16-20 years, and to evaluate associations of time-varying eating behaviors and body mass index (BMI, kg/m²).

Methods: The NEXT Study is a nationally representative cohort (n=2785) of US adolescents enrolled in 2009-10 and assessed annually; wave 1-4 data (W1=10th grade - W4=1st year after high school) are included (78% W4 retention). Self-administered surveys queried 7-day frequency of food group intake (fruit and vegetables, whole grains, sugar-sweetened soda, and sweet and salty snacks) and meal types (breakfasts, family meals, eating at fast food restaurants, and meals while watching television). BMI was calculated from self-reported height and weight. Generalized estimating equations with multiple imputation for missing data examined trajectories of eating behaviors overall and by baseline weight status (normal weight=5≤BMI%ile<85 (n=1866,67%); overweight=85≤BMI%ile<95 (n=501,18%); obese=BMI%ile≥95 (n=418,15%)), accounting for the complex sampling design and socioeconomic and behavioral covariates. Similar models separately examined associations between time-varying meal types and food group intakes, and between time-varying BMI and eating behaviors.

Results: Eating behaviors tracked strongly from W1-W4 (residual intraclass correlation=41%-51%). Across all baseline weight categories, frequency of all food group intakes and meal types decreased over time, except for constant fast food intake. Fruit/vegetable intake was associated positively with family meals and breakfast, and inversely with fast food (<0.001), while whole grain intake was associated positively with family meals, breakfast and television meals (p<0.05). Soda and snacks were positively associated with television meals and fast food (p<0.001), while soda was inversely associated with breakfast frequency (<0.001). Time-varying BMI was inversely associated with time-varying snack intake (p=0.02), but was unrelated to other eating behaviors.

Conclusions: Strong tracking over time supports the role of early intervention for improving healthy eating behavior trajectories in US adolescents. Findings suggest more optimal food group intakes are associated with higher frequency of family meals and breakfast and lower frequency of television meals and fast food. Previously observed associations between eating behaviors and BMI were not replicated in this sample, suggesting the need for further research exploring more salient aspects of eating behavior in contemporary youth.

05.2.2

Adolescents' eating context of non-core food consumption: a multilevel model analysis

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Little is known about the context in which adolescents' eat non-core foods, although specific environments could be targeted by interventions to improve adolescents' dietary habits.

Methods: Data from 4-day food diaries were collected from 666 adolescents aged 11-18 years old participating in the UK National Diet and Nutrition Survey (NDNS). NDNS food items were classified as 'non-core' based on fat and sugar cut-off points per 100g of food; and eating context was defined as 'where' and 'with whom' each reported eating occasion (EO) occurred. Percentages of non-core calories (NC kcal) were calculated across the entire survey in total and for each eating context. Linear multilevel models were used to investigate the effect of 'where' and 'with whom' adjusting for time of the day and day of the week in the EO level and for age, sex, energy intake, BMI and SES in the individual level.

Results: NC Kcal was 57% and 65.8% of all calories eaten at 'Eateries' and 'On the go' locations compared with 33.2% eaten at 'Home'. NC Kcal were 51.3% of all calories eaten with 'Friends' compared to 32.1% eaten with 'Parents/carers'. In the univariable model, only 0.7% of variation in NC kcal was attributed to differences between adolescents and 99.3% of variability in NC food consumption was accounted for by within-person factors that vary from one eating occasion to another. In the multivariable adjusted model eating at 'Eateries' was associated with 41.7 (SE 0.96) more NC kcal compared to eating at 'Home', while eating with 'Family and friends' was associated with 29.7 (SE 0.07) more NC kcal compared to eating 'Alone'. Sex and energy intake (per 1000 kcal) were the only individual characteristics associated with NC kcal consumption [-1.4 (0.05) and 6.0 (0.05) respectively] and together explained 44.9% of the variability in NC kcal consumption between adolescents.

Conclusions: In this UK sample, differences in NC kcal consumption are mainly driven by variability within adolescents. Regardless of individual characteristics, adolescents' NC kcal consumption was higher at 'Eateries' and with 'Family and friends'. Targeting specific eating settings and not specific individuals may contribute to more effective interventions.

05.2.3

Adolescent's health perceptions of snack foods

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Increasing snacking habits in Western countries are a cause for concern as snack foods and beverages are often energy-dense and nutrient-poor. Adolescents tend to snack frequently and have higher intakes of energy-dense and nutrient-poor foods. Therefore nutritious choices should be promoted among this group, particularly as poor eating habits track into adulthood. The ability to evaluate how nutritious snacks are, is essential when making healthy choices. However, very little is known currently about why foods or beverages are perceived as nutritious or healthy by adolescent consumers. This study investigated, which criteria adolescents use to evaluate snack foods available in school cafeterias.

Methods: The snack supply from various school cafeterias in the region of Zurich, Switzerland was analysed and a representative selection of foods established. Adolescents aged 12 to 16 years were invited individually to the laboratory to sort 37 snacks into a line ranging from 'unhealthy' to 'very healthy' and from 'not nutritious' to 'very nutritious'. The sorting data were analysed using multidimensional scaling analysis with property-fitting and hierarchical clustering.

Results: The analysis of the snack supply in the schools revealed that adolescents have access to a wide variety of predominantly unhealthy snacks. Preliminary analysis of the sorting data shows that the adolescents clearly grouped the snacks into an 'unhealthy' and a 'healthy' cluster and did not make an intermediate group. Total sugar and fat content of the snacks negatively influenced health perceptions, while higher fiber content was associated with a more positive perception of the foods.

The results of the nutritious sorting task were not conclusive, as the adolescents mostly interpreted the German term for the word 'nutritious' as 'satiating'.

Conclusions: Adolescents were able to evaluate the healthiness of the snacks using specified criteria. Although they knew 'what would be good for them', adolescents reported frequent consumption of unhealthy products such as potato chips, cookies and chocolates and availability of a wide variety of unhealthy snacks within school environments was high. Future studies should investigate the relationship between health perceptions and preferences in particular risk groups such as obese adolescents and young adults.

05.2.4

Determinants of Adolescent Restaurant Spending in the United States

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: To examine determinants of restaurant spending among adolescents. Early restaurant spending may establish life-long dietary habits with long term negative health effects.

Methods: This is a cross-sectional study using the 2007 Child Development Supplement III to the Panel Study of Income Dynamics. Participants were a representative sample of US adolescents ages 12-18 (N=1,181). Multivariate zero-inflated negative binomial regression was used to generate two analytic models of the following outcomes: whether or not the adolescent spent money at a restaurant in the past week (logistic regression) and, among restaurant spenders, factors that influence the amount they spent (linear regression).

Results: About 53% of adolescents spent their own money at restaurants in the past week; the median amount was \$3 (\$0, \$10). More frequent fast food intake (Adjusted Odds Ratio (AOR) 3.47; 95% Confidence Interval (CI) 2.30, 5.24) and more frequent soda intake (AOR 1.43; 95% CI 1.01, 2.01) were associated with any restaurant spending.

Among past week restaurant spenders, some factors predicted more or less spending. For instance, Black adolescents were likely to spend more money compared to White adolescents (Adjusted Relative Risk (ARR) 1.33; 95% CI 1.25, 1.42). Poor and middle income adolescents were also more likely to spend more compared to high income adolescents (ARR 1.44; 95% CI 1.29, 1.60 and ARR 1.10; 95% CI 1.02, 1.19, respectively). Overweight adolescents were likely to spend less at restaurants compared to normal weight adolescents (ARR 0.73, 95% CI 0.68, 0.78). While, adolescents who reported that their parents knew how they spent their time were likely to spend less at restaurants compared to adolescents with reportedly less informed parents. (ARR 0.58; 95% CI 0.53, 0.64).

Conclusion: The majority of adolescents in the US spend at least some of their own money at restaurants. As adolescents develop, so to do their individual spending habits. Understanding the food purchases of adolescents may provide insight into the establishment of dietary patterns. Future research to explore reasons for adolescent restaurant spending is warranted.

05.2.5

How is reward sensitivity associated with adolescents' unhealthy snack intake? Examining the role of external eating and availability of unhealthy snacks.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Previous research found that an increased Reward Sensitivity (RS) in adolescents was positively associated with more unhealthy snack intake. Individuals with a high RS may be more sensitive and reactive to rewarding food items in the environment, i.e. fat- and sugar-rich food products such as energy-dense snacks. Thus adolescents with a high RS might be tempted to eat in response of environmental cues and as such develop an external eating style. Firstly it was aimed to assess if RS is associated with unhealthy snack intake in adolescents aged 14-16 years old and if this relation is mediated by external eating. Secondly we wanted to investigate if the availability of unhealthy snacks at home or at school moderated the RS-external eating association, as it is expected that an obesogenic environment would enhance development of an external eating style in high RS adolescents.

Methods: Self-reported data on snacking behaviour, availability at home and at school of unhealthy snacks, RS (BAS DRIVE) and external eating (DEBQ) of Flemish adolescents (n=1104, mean age = 14.7±0.8 years; 50.9% boys; 18.0% overweight) were collected via a cross-sectional survey. Multilevel moderated mediation analyses were conducted using Generalized Structural Equation Modeling (path analysis) in four steps (four GSEM models) in STATA version 13. Gender and zBMI were added as covariates, as these were significantly correlated to the outcome.

Results: Model 1 showed that RS was positively associated to unhealthy snack intake (b=26.83, p<0.001). Model 2 indicated a partial mediation effect of external eating (a*b=6.53, c'=24.70, p<0.001). In model 3 and 4 no moderation of availability at home or at school on the path between RS and external eating was found.

Conclusion: Our findings indicate that the consumption of unhealthy palatable snacks is determined by the development of an external eating style coming from an increased RS. However a high availability of unhealthy snacks at home or at school did not enhance this development. Thus adolescents seem to develop an external eating style fostered by a high RS independent of their home or school environment. Future interventions in adolescents should acknowledge differences in RS and related eating styles.

05.2.6

How to include a participatory approach in the development of a serious game to improve adolescents' dietary behaviours? The REWARD-project

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: As high intake of energy-dense snacks is common in adolescents and has been related to overweight, the REWARD-project aims to develop and evaluate a serious game intervention focusing on improving Flemish adolescents' snacking patterns. This intervention is developed according to the principles of the Intervention Mapping Protocol which includes a strong collaboration with the users' groups (i.e., the target group and implementers) and other stakeholders (i.e. community members) during the development.

Methods: The application of the participatory approach in the REWARD-project is twofold. Firstly, an intensive participation is pursued in all phases of the intervention development. Secondly, the participation is multiple as several significant stakeholders are included in this process.

Results: The serious game intervention is developed in partnership with teenagers, teachers, and other stakeholders (i.e., food industry, professional organizations active in health promotion, community members, overall school organizations). The starting point for this intervention was a large-scale cross-sectional study investigating dietary and game behaviours and individual and environmental determinants of these behaviours among 1100 Flemish adolescents. Subsequently, focus group research was conducted among 100 adolescents to investigate the nutrition-related results of this cross-sectional study into depth. This mixed methods technique provided a good theoretical basis for intervention development. Next, focus groups were conducted with the same pool of adolescents to brainstorm about the conceptual model of the serious game (i.e., preferred game dynamics, game use, and game motivations). Additionally, adolescents were involved throughout the further development of the intervention via test labs in smaller groups. Monthly teacher contacts were also included during the process to ensure that the game format is fully compatible with existing guidelines, expectations, and school programs. Other stakeholders were frequently consulted through stakeholder meetings to explore and affirm that the current intervention can be disseminated to wider society.

Conclusions: A strong participation of several stakeholders in the different phases of intervention development ensures the development of a culturally-, age- and community-relevant intervention which increases the likelihood of program success.

06.2. ORAL:

Nutrition and physical activity epidemiology

06.2.1

Associations between early body mass index trajectories and later metabolic risk in European children: The IDEFICS Study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Adiposity is a risk factor for several health outcomes. However, yet it is not clear whether it is mainly the actual weight status or (in addition) the trajectory of adiposity, especially changes throughout early life, that affects health. This study aims to apply a 2-step procedure to investigate the association between body mass index (BMI) trajectories during infancy/childhood and metabolic risk at a later age in order to identify periods of growth related to later metabolic health.

Methods: In a first step, BMI trajectories of 3,301 European children that participated in the multi-centre IDEFICS study were modelled using linear-spline mixed-effects models (step 1). The resulting random coefficients indicating initial subject-specific BMI and rates of change in BMI over time were used as exposure variables in the second step to assess associations between BMI growth and a metabolic risk score as well as with its single components measured in later childhood (mean age at outcome assessment: 8.5 yrs). The metabolic risk score was derived applying a z-score standardisation based on recently published reference values for young children to combine blood pressure, dyslipidaemia, waist circumference and hyperglycaemia into one continuous variable.

Results: All exposures under investigation, i.e. BMI at birth, rates of BMI change during infancy (0 to <9 mths), early childhood (9 mths to <6 yrs) and later childhood (≥6 yrs) as well as current BMI z-score were significantly associated with the later metabolic risk score. Associations were strongest for the rate of BMI change in early childhood ($\beta=1.50$; $p<.0001$) and for current BMI z-score ($\beta=1.17$; $p<.0001$) and least pronounced for BMI at birth ($\beta=0.41$; $p<.0001$). Results slightly differed with regard to the single metabolic risk factors.

Conclusions: Rapid BMI growth during childhood, especially during early childhood, is significantly related to later metabolic risk. The associations of early BMI growth may be largely mediated through its effect on later BMI growth and current BMI. The time span from 9 mths to 6 yrs may be a sensitive time window for interventions focusing e.g. on nutritional and behavioral factors related to BMI growth.

O6.2.2

All in the Family: Associations between Parents', Adolescents' and Siblings' Weight and Weight-related Behaviors

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SIG: Yes, Children and families

Awards: No

Objective: While it is recognized that the "family" influences adolescents' weight and weight-related behaviors (e.g., dietary intake, physical activity, sedentary behaviors), the majority of studies have only investigated the parent and adolescent relationship. Very limited research has investigated how siblings' weight and weight-related behaviors are associated with adolescents' weight, dietary intake and physical activity. The main objective of this study is to examine whether and how parents' and siblings' weight and weight-related behaviors are associated with adolescents' weight and weight-related behaviors. Results will inform which family members may be important to include in adolescent obesity prevention interventions.

Methods: Data from two linked population-based studies, EAT 2010 (Eating and Activity in Teens) and F-EAT (Families and Eating and Activity in Teens), were used for cross-sectional analyses. Parents (n=95; 88% females; mean age=41.0 years), siblings (n=95; 60% girls; mean age=14.7 years), and adolescents (n=95; 52% girls; mean age=14.3 years) were socioeconomically and racially/ethnically diverse. Multiple regression models were fit to investigate the association between parents' and siblings' weight and weight-related behaviors and adolescents' weight and weight-related behaviors.

Results: Siblings' weight status was significantly associated with adolescents' weight status. Additionally, the majority of siblings' weight-related behaviors (i.e., fruit and vegetable intake, fast food consumption, breakfast frequency, sedentary patterns, dieting behaviors) were positively associated with adolescents' weight-related behaviors ($p < 0.05$). Only parents' fast food consumption and sugar-sweetened beverage intake were positively associated with adolescents' same behaviors.

Conclusions: Siblings' weight and weight-related behaviors were more strongly associated with adolescents' weight and weight-related behaviors, for better or for worse, as compared to parents' weight and weight-related behaviors. For example, siblings' fruit and vegetable intake was associated with higher fruit and vegetable intake in adolescents, as well as, siblings' fast food intake was associated with higher fast food intake in adolescents. Because of the consistently strong associations found between siblings' and adolescents' weight and weight-related behaviors, it may be important to consider including siblings in adolescent obesity prevention interventions. Furthermore, it would be important for future longitudinal research to confirm the associations found in the current study overtime.

O6.2.3

The SPOTLIGHT Virtual Audit Tool: A valid and reliable tool to assess obesogenic characteristics of the built environment

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

According to socio-ecological models of health behaviour, characteristics of the physical environments in which we live (e.g. land use, street design, recreational facilities, presence and density of food outlets) substantially influence energy balance related behaviours and thus the likelihood of overweight and obesity. To improve research on the obesogenicity of physical environments, reliable, valid and convenient assessment methods of potential obesogenic characteristics of environments are needed. This study examines the reliability and validity of the SPOTLIGHT-Virtual Audit Tool (S-VAT), which uses remote sensing techniques (Street View feature in Google Earth) for desk-based assessment of environmental characteristics potentially related to obesity.

Methods:

A total of 128 street segments in four Dutch urban neighbourhoods - heterogeneous in socio-economic status and residential density - were assessed using the S-VAT. Environmental characteristics were categorised as walking related items, cycling related items, public transport, aesthetics, land use-mix, grocery stores, food outlets and physical activity facilities. To assess concordance of inter- and intra-observer reliability of the Street View feature in Google Earth, and the criterion validity as compared to real life audits, percentage agreement and Cohen's Kappa (k) were calculated.

Results:

Intra-observer reliability was high and ranged from 91.7% agreement ($k = 0.654$) to 100% agreement ($k = 1.000$) with an overall agreement of 96.4% ($k = 0.848$). Inter-observer reliability results ranged from substantial agreement 78.6% ($k = 0.440$) to high agreement, 99.2% ($k = 0.579$), with an overall agreement of 91.5% ($k = 0.595$). Criterion validity was substantial to high for most of the categories ranging from 87.3% agreement ($k = 0.539$) to 99.9% agreement ($k = 0.887$) with an overall score of 95.6% agreement ($k = 0.747$).

Conclusion:

Despite some disadvantages of using Google Street View (such as temporal validity of items and impaired visibility of pedestrian areas), these study results suggest that the S-VAT is a highly reliable and valid remote sensing tool to assess potential obesogenic environmental characteristics.

O6.2.4

Association between breakfast eating frequency, physical activity and sedentary time in college freshmen

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Breakfast is traditionally considered the most important meal of the day; however, data linking breakfast behaviors to health status is not well characterized. Breakfast may not be an independent primary variable but rather a proxy measure for a healthy lifestyle. The prevalence of skipping breakfast in 14-18 yo is ~32% in the US. The transition from the parental home is a potentially critical period of life for establishing long-term health behaviors. Thus, the aim of this study was to investigate whether physical activity (PA) and sedentary time differ in college freshmen dependent on breakfast-eating frequency.

Method: First year college students (n=429) at a large public US university were assessed for breakfast behavior using a multiple pass method and 3-day food record analyzed by the Minnesota Nutrition Data System for Research Software. Objective PA was determined via accelerometer (NL-1000; minimum of 4 days, 10-hr/day), and sedentary time via the International Physical Activity Questionnaire. Data were analyzed using a oneway independent groups ANOVA, Fisher LSD post hoc tests and mean plots.

Results: Groups were characterized as eating breakfast rarely (0 or 1 day out of 3; n = 61), sometimes (2 days out of 3; n = 115) or always (all 3 days; n = 229). The omnibus test for Group was significant (p < .05) for daily moderate-to-vigorous PA (MVPA) and daily steps, but nonsignificant for sedentary time (p > .05). Overall, average time spent sitting was 5:46±3:06 hrs/day. Although mean plots showed a positive linear trend for MVPA and daily steps (minutes MVPA: 40±16 vs. 48±20 vs. 52±22; steps/day: 9,554±2,908 vs. 10,834±3,289 vs. 11,444±3,497 for the Rarely, Sometimes and Always groups, respectively), the post hoc tests were not significant for the comparison between the Sometimes and Always groups.

Conclusions: Breakfast behavior is associated with higher levels of physical activity but not sedentary time in college freshmen. More research is needed to characterize the impact of breakfast behavior on health outcomes, independent of other key behaviors such as PA, especially in the emerging adult population known to be establishing health behaviors.

O6.2.5

Lifestyle behaviours associated with 5-year weight gain in young adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: There are many dietary, physical activity and sedentary behaviour guidelines that aim to promote good health. The effect of non-compliance with these recommendations on weight gain is not well understood. This study examined whether health behaviour non-compliance: skipping breakfast, takeaway food consumption (≥2 times/week), television viewing (>2 hours/day) and daily steps (<10,000 steps/day) predicted 5-year weight gain in young adults.

Methods: A national Australian sample of 1,052 participants (42% men, 26-36 years) completed questionnaires and wore a pedometer for seven days at baseline (2004-06) and follow-up (2009-11). Breakfast skipping was defined as not eating before 9am the previous day. Usual takeaway food consumption and television viewing were self-reported. Weight was measured or self-reported, with a correction factor applied to self-reported information. Non-compliance for each behaviour was defined using national guidelines and participants were classified into one of four groups based on when they were non-compliant: neither baseline nor follow-up (reference group), baseline only, follow-up only, both baseline and follow-up. Additional weight gain, compared to the reference group, was calculated using linear regression, adjusted for baseline weight and sociodemographic variables.

Results: Mean 5-year weight gain was 2.25kg (SD 6.29) for men and 1.92kg (SD 6.48) for women. Compared to the reference group, additional weight was gained among men who skipped breakfast at follow-up (2.78kg 95%CI 0.96-4.61) and both time points (2.95kg, 95%CI 0.91-5.00); and watched television for more than 2 hours/day at follow-up (1.88kg, 95%CI 0.21-3.56). Among women, greater weight gain was associated with consuming takeaway food ≥2 times/week at follow-up (2.82kg, 95%CI 0.61-5.04) and both time points (2.51kg, 95%CI 0.30-4.73); watching television >2 hours/day at both time points (1.93kg, 95%CI 0.436-3.44); and averaging <10,000 steps/day at follow-up (2.20kg, 95%CI 0.12-4.29) and both time points (2.10, 95%CI 0.48-3.71). Individuals who improved their behaviour (non-compliant at baseline but compliant at follow-up) had similar weight gain to those who met the guidelines at both time points.

Conclusion: Different behaviours were associated with 5-year weight gain for men and women, suggesting that sex-specific health promotion strategies may be required. Weight gain tended to reflect current behaviour and improving behaviour reduced weight gain.

O6.2.6

Life course models of urban-rural status and body mass index: results from a 25 year follow-up study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Most existing studies investigating the effects of rural areas of residence on BMI rely on cross-sectional data and it is therefore unclear how exposure to rural areas across the life course affects BMI in mid-adulthood. This study aimed to investigate whether BMI in mid-adulthood was predicted by trajectories of residence across urban and rural areas from childhood to adulthood.

Methods: Data were from an Australian national cohort study. Participants were 9-15 year-olds in 1985 (n=6559) who were followed up in 2004-06 (n=3960, aged 26-36) and 2009-11 (n=2665, aged 31-41). Area of residence was classified as urban or rural at baseline (postcode level) and follow-ups (census collection district level). Weight and height in 2009-11 were self-reported. Life course modelling was used to test which of three common theoretical life course models, 'accumulation of risk', 'sensitive period' or 'mobility', best explained the association between area of residence and BMI by comparing the fit of a series of nested linear regression models with a fully saturated model.

Results: The effect of area of residence on mid-adulthood BMI was best described by the accumulation model and sensitive period model at ages 26-36. BMI at ages 31-41 years were higher for those living in rural areas during the sensitive period at ages 26-36 years ($\beta=1.04\text{kg/m}^2$, $p<0.001$). Further analyses suggested that the risk was greater for those exposed during the ages 26 to 30 rather than 31-36. BMI was also higher for those who had greater accumulated exposure to rural areas throughout the life course ($\beta=0.40\text{kg/m}^2$ per time point in a rural area, $p<0.001$).

Conclusions: Living in a rural area was associated with higher BMI. The risk was greatest in those exposed to rural areas of residence for longer and those exposed during young adulthood. Investigating the contribution of physical activity and food environments to BMI in rural areas across the life course may help explain the associations observed. This is the first known study to have applied life course models to investigate whether BMI in mid-adulthood was predicted by trajectories of urban-rural residence from childhood to adulthood.

O1.3. ORAL:

Physical activity and sedentary behavior interventions in adults

O1.3.1

Are community wide interventions for increasing physical activity effective?

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SIG: Yes, Policies and environments

Awards: No

Purpose:

To evaluate the effects of community wide, multi-strategic interventions upon population levels of physical activity.

Methods:

We updated a previously published Cochrane Collaboration systematic review, using standard review and risk of bias methods. Searches were updated to January 2014, unrestricted by language or publication status, including searching references of reference and contacting authors and experts. We included cluster randomised controlled trials, randomised controlled trials, quasi-experimental designs which used a control population for comparison, interrupted time-series studies, and prospective controlled cohort studies. Only studies with a minimum six-month follow up from the start of the intervention to measurement of outcomes were included. Community wide interventions had to comprise at least two broad strategies aimed at physical activity for the whole population.

Results:

We included 33 studies, with 25 studies based in high-income countries, and eight in low-income countries. The interventions varied by the number of strategies included and their intensity. Almost all of the interventions included a component of building partnerships with local governments or non-governmental organisations (NGOs) (29 studies). Many also employed some form of individual counselling by health professionals (18 studies), mass media (15 studies) or other forms of communication (18 studies). Fewer studies worked in specific settings (11 studies) or used environmental change strategies (7 studies). None of the studies provided results by socio-economic disadvantaged or other markers of equity consideration. Nineteen studies were identified as having a high risk of bias, ten studies were unclear, and four studies had a low risk of bias. Generally, some of the more strongly designed studies showed no improvement in the primary outcome measure of physical activity although observed some program level effect. No adverse events were reported by any study.

Conclusions:

The body of evidence in this review does not support the hypothesis that at present multi-component community wide interventions effectively increase physical activity for the population, although some studies with environmental components observed more people walking. Community wide interventions to promote physical activity could in principle be effective. However, in practice, their effects may remain undetected unless current research improves design, implementation and evaluation of these interventions.

O1.3.2

Associations amongst sedentary and active behaviours, energy expenditure, body fat and appetite dysregulation

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: The objective was to investigate whether measures of appetite dysregulation were associated with sedentary time, physical activity, energy expenditure or fat mass. Cross-sectional and prospective studies indicate sedentary behaviour is associated with obesity. Most studies use questionnaire based self-report measures of sedentary time. In contrast, this study employed an innovative device that measured motion, galvanic skin response, skin temperature and heat flux.

Methods: Thirty demographically diverse participants (8men, 22women; age: 49.1 ± 14.2 years; BMI: 26.8 ± 4.9 kg/m²) took part in this cross-sectional study. Measures of body composition (Bodpod), health markers, cardiovascular fitness and resting metabolic rate (indirect calorimetry), and appetite dysregulation (Three-Factor Eating Questionnaire and Binge Eating Scale) were taken as well as 6-7 days measurement of free-living physical activity (light 1.5-3 METs; moderate 3-6 METs; and vigorous >6 METs) and sedentary behaviour (<1.5 METs) with the SenseWear Armband (BodyMedia). Active energy expenditure was calculated by subtracting measured resting metabolic rate from total measured energy expenditure calculated by the Armband.

Results: A minimum of 6 full days (>22h/day) were analysed for each participant (7 days: n=14; 6 days: n=16). Average wear-time of the SenseWear Armband was $98 \pm 1.3\%$ of total possible wear-time. Sedentary behaviour was positively correlated with multiple indices of adiposity including fat mass ($r=.39, p<.05$), body fat percentage ($r=.38, p<.05$) and waist circumference ($r=.40, p<.05$). Moderate-to-vigorous physical activity (>3 METs) was negatively associated with fat mass ($r=-.69, p<.001$), body fat percentage ($r=-.70, p<.001$) and waist circumference ($r=-.65, p<.001$). Physical activity and sedentary behaviour were not associated with indices of appetite dysregulation. TFEQ Disinhibition and Binge Eating were positively associated with BMI ($r=.75, p<.001$; $r=.57, p=.001$), fat mass ($r=.70, p<.001$; $r=.58, p=.001$), body fat percentage ($r=.63, p<.001$; $r=.45, p<.05$) and waist circumference ($r=.69, p<.001$; $r=.58, p=.001$) but not with lean mass ($r=.24$ (ns); $r=.13$ (ns)). Active energy expenditure was negatively associated with sedentary time ($r=-.43, p<.05$) and positively associated with moderate-to-vigorous physical activity ($r=.45, p<.05$).

Conclusion: Sedentary time was associated with low energy expenditure and higher adiposity whereas MVPA was associated with higher energy expenditure and lower adiposity. Higher adiposity (but not sedentary time, physical activity or low energy expenditure) was associated with Disinhibition and Binge Eating (appetite dysregulation).

Acknowledgements: The research leading to these results has received funding from EU projects under grant agreement n° 610440 (DAPHNE) and 289800 (SATIN).

O1.3.3

Sit-stand desks reduce sitting time at work without negative impact on objective productivity indicators. Results from the Opt To Stand Study

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Sit-stand workstations have shown promise for reducing sitting time at work, but few studies have examined their impact on productivity in a real world office environment. This study examined the effects of using sit-stand desks on objectively and subjectively assessed sedentary behaviour and productivity in desk-based workers.

Methods: Participants in this quasi-experimental study were customer care (call-centre) staff from two job-matched teams located in separate areas of one worksite in a large telecommunications company in Sydney (45% female, 33 ± 11 years old). Intervention group participants (n=16) received new sit-stand desks, while the comparison group (n=15) used their regular desks. Primary outcomes were workday sedentary behaviour assessed using ActivPALs, Actigraphs, and self-report questionnaires. Productivity was assessed using company-specific objective metrics. Measurements were taken at baseline and at one and four weeks after desk installation. Linear mixed models were used to calculate adjusted means for outcomes.

Results: After four weeks, intervention participants reported significantly decreased sitting time at work (-76 min/workday; 95% CI: -142, -11) and increased standing time at work (+96 min/workday; 95% CI: 41,150); comparison group participants showed no changes. Objectively assessed sitting and standing patterns mirrored self-report data, but were not significant. Call handling time, talk time, time on hold, wrap up time, attendance days, and sick leave days did not change significantly from baseline to follow-up in either group.

Conclusions: Installing sit-stand desks can reduce sitting time at work without detriment to productivity in call centre workers. More studies involving workers in diverse desk-bound roles and company-specific productivity measures are needed to elucidate the public health impact and feasibility of sit-stand workstations.

O1.3.4

Workplace Standing Time and the Incidence of Obesity and Type 2 Diabetes: A Longitudinal Study in Adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: It is increasingly recognized that standing represents a simple solution to extended periods of sitting. However, it is currently unknown whether workplace standing time is prospectively associated with a lower incidence of chronic diseases. The objective of this study was thus to examine the association between workplace standing time and the incidence of overweight/obesity (OW/OB) and impaired glucose tolerance/type 2 diabetes (IGT/T2D) in adults.

Methods: A longitudinal analysis from the Quebec Family Study (Canada) was conducted on 293 participants, aged 18 to 65 years, followed for a mean of 6 years. Information on self-reported occupational standing time as well as several covariates was collected at both baseline and follow-up. Outcome measures included the development of OW/OB (i.e. body mass index ≥ 25 kg/m²) and IGT/T2D (i.e. 2-h postload plasma glucose level ≥ 7.8 mmol/L).

Results: The incidence rates of OW/OB and IGT/T2D over the 6-year follow-up period were 17.4% and 12.6%, respectively. Significant negative associations were observed between the amount of occupational standing time and the development of outcome measures. However, the associations were no longer significant after adjustment for age, sex, smoking habits, total annual family income, daily caloric intake, and submaximal working capacity. In age- and sex-adjusted logistic regression analysis, significant negative linear trends were observed across levels of standing time and the outcome variables. However, the associations were no longer significant after further adjustment for the other covariates. Finally, we observed that the change in standing time from baseline to year 6 was significantly associated with the development of outcome measures, with higher incidence rates in adults reporting a reduction in standing time at follow-up. However, the associations became non-significant after adjustment for covariates.

Conclusions: Greater occupational standing time is not sufficient in and of itself to prevent the development of OW/OB and IGT/T2D in adults. Future efforts are needed to better understand the potential benefits of higher amounts of standing time throughout the day on the prevention of chronic diseases.

O1.3.5

Can Behavioural Economics Make Us Healthier? Discounting Rates, Risk Preference and Physical Activity

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: The decision to maintain a healthy habit, such as physical activity, involves a trade-off between a short-term cost, such as time and effort, and long-term health benefits. The temporal choice is determined by individual's time preference. More specifically, those who maintain regular physical activity are more concerned with long-term health benefits, whereas individuals with more sedentary lifestyles tend to discount future benefits more. Previous research also suggests that individual risk preference is positively associated with health related behavior. A more risk-averse individual is more likely to have healthy habits than his/her less risk-averse counterparts. To date, there has been a dearth of research in this area. The purpose of this study was to investigate the relationship between discount rates and risk preferences and physical activity, and how this influenced participants' response to a financial incentive intervention to increase physical activity.

Methods: Participants (n=406 office-based employees; mean age 43 years) took part in a quasi-experimental trial investigating the effectiveness of a 12-week financial incentive intervention to increase physical activity levels. At the end of the intervention a novel behavioural economic field experiment was conducted face-to-face involving a 2-stage procedure. Firstly, two economic experiments, namely multiple price lists (MPL) and monetary trade-off tables, were conducted with participants to measure their risk preferences and discount rates, respectively. The two variables were jointly estimated by the maximum likelihood procedure. Secondly, the predicted risk preferences and discount rates were related to minutes of objectively-measured physical activity, while controlling for socio-economic variables (e.g. age, gender, staff grade).

Results/findings: Discount rates were negatively associated with minutes of physical activity (which is in line with the hypothesis) and demonstrate that older people ($p=0.02$), those with a lower staff grade ($p<0.00$), those who were single ($p<0.00$) and those with no children ($p<0.00$) have higher discount rates. Results showed no significant relationship between risk preference and physical activity ($p=0.10$).

Conclusions: Results show that individuals discounting rates are significantly associated with physical activity which has implications for the design of future novel public health interventions.

O2.3. ORAL: Technology in physical activity and sedentary behavior research

O2.3.1

MyCity: Glasgow – how can a mobile app based game increase physical activity in the context of a mass spectator sporting event?

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SIG: Yes, e- & mHealth

Awards: No

Purpose: There are many mobile applications being developed to promote healthy lifestyles. Some use gamification as well as psychological behaviour change techniques (BCTs) to increase engagement and potential impact on health behaviours. Despite growing research in this area, there is little evidence of game-based apps being rigorously evaluated 'in the wild' to explore the mechanisms through which they can achieve widespread user-engagement and health behaviour change. MyCity: Glasgow is a mobile app-based game that aims to use BCTs (self-monitoring of physical activity with daily goal setting and feedback), gamification principles (self-expression, achievement (e.g., quizzes), status and competition) and GPS-based features (e.g., challenge trails to encourage users to physically visit locations around Glasgow) to increase physical activity (PA) and engagement with Glasgow during the period of the 2014 Commonwealth Games.

Methods: MyCity: Glasgow was released on Google Play and Apple App Stores in early summer 2014, and real-time usage data logged for 3 months. A mixed-methods approach used quantitative android phone-logged data, an online user experience survey (N=56) and qualitative user interviews (n=11) to investigate uptake, use of behaviour change and gamification features, and impact on physical activity.

Results/findings: The app was downloaded 1096 times (android N=673; iOS N=423). Most users were aged 12-25 years (43.1%) or 26-40 years (32.6%), with uptake declining with age; over half (51.5%) described themselves as physically inactive at baseline. Almost a quarter (24.3%) of daily activity goals were achieved; 3,907 quiz questions were attempted, over 72% of which were answered correctly. Survey respondents and interview participants endorsed the self-monitoring and daily activity goal features "... it encouraged me to go a walk at lunchtime at work and I was intrigued to find out how many points I had. It was good to meet my daily target." Engagement with GPS-based features was low: only 11 people attempted at least one MyCity: Glasgow challenge trail.

Conclusions: MyCity: Glasgow demonstrates the potential of using real-time 'in the wild' data logging and qualitative interviews to understand the mechanisms of engagement and action of mobile game-based apps to promote healthier lifestyles.

O2.3.2

The Mums Step it Up Program - a social networking physical activity intervention for post-partum women delivered via a Facebook application

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Objective: This study aimed to determine the effectiveness of the 'Mums Step it Up' program, a 50 day team-based physical activity intervention for postpartum women delivered via a Facebook app. The 'Mums Step It Up' program is based on the Theory of Planned Behaviour and Fun Theory and includes features to facilitate peer encouragement and support. 'Captain Women' form teams with 3-8 of their Facebook friends with the aim of achieving 10,000 steps/day measured by a pedometer. The app is used to log daily steps and interact with team mates.

Method: 120 women up to 12 months postpartum were recruited through advertising. Participants were randomly allocated into one of three groups: control, pedometer only and the 'Mums Step it Up' program. Assessments were completed at baseline, 6 weeks and 6 months. The primary outcomes were accelerometer-derived and self-reported physical activity. The secondary outcomes were sleep quality and quantity, depressive symptoms, weight and quality of life. Data were analysed on an intention-to-treat-basis using random effects mixed modeling.

Results: Preliminary results from baseline to 6 weeks (into the intervention period) showed that participants in the Mums Step it Up group increased their self-reported moderate to vigorous physical activity by an average of 155 min/week, followed by the pedometer group (115 min/week) and the control group (23 min/week). Walking was the most popular activity, however, the Mums Step It Up group also saw an increase in the time spent in other moderate activities (29 min/week) and the pedometer group saw an increase in vigorous activities (44 min/week). Sleep quality was the only secondary outcome where there was a significant group by time difference with the Mums Step It Up group reporting a decrease in sleep quality at 6 weeks ($p=0.045$).

Discussion: The 24-hour availability, flexibility and saliency of Facebook suggests that it may be a useful platform for the delivery of health behavior interventions. Preliminary findings from this study provide some support for this. Further research is required to explore the effectiveness of social networking sites for other population groups and health related behaviours.

O2.3.3

Counting chickens before they are hatched...?! – An electronic diary study regarding self-efficacy and intentions to be physically active

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose:

Translating intentions into action often fails, especially in contexts that require a certain amount of personal effort such as becoming more physically active. It is known that strong self-efficacy (SE) beliefs enhance the likelihood that activity-related intentions are implemented (Rhodes & Dickau, 2013). Previous research focused on examining the implementation of previously formed intentions over a longer time period in pre-post-studies (long-term intentions). However, people also form intentions on a daily basis, e.g. the intention made in the morning to do sports in the evening (short-term intentions). The objective of the present study was to examine if SE beliefs affect the formation and implementation of physical activity-related intentions in everyday life.

Methods:

A diary study with 91 persons (32.6% male, 25-65 years, M=45.3, SD=8.0) was conducted. Using smartphones the participants answered short questionnaires three times a day over seven consecutive days. In the morning they were asked if they had the intention to exercise that day and in the evenings if they actually did so. An index was calculated reflecting the frequency of translating intentions into action. Additionally, physical activity was assessed via accelerometry. Physical activity-related SE beliefs (Fuchs & Schwarzer, 1994) were assessed with a paper-pencil questionnaire administered before the diary phase started. Linear regressions were calculated to analyse the effect of SE on both forming and implementing daily intentions during a week.

Results:

SE significantly predicted the formation of physical activity-related intentions over the course of a week ($\beta=.40$, $p<.01$). Furthermore, SE affected the implementation of these intentions ($\beta=.40$, $p<.01$). The higher the SE the more often intentions were formed in the morning and the more frequently they were translated into action, i.e. exercising in the afternoon or evening.

Conclusions:

SE affects the implementation of short-term intentions. Persons with a high SE seem to be able to translate health-related intentions into action on the day-level. The results emphasize the relevance of SE regarding long-term behaviour changes. Further research should focus on other factors, e.g. daily hassles, affecting the implementation of short-term intentions and their interaction with SE.

O2.3.4

The influence of a DVD-delivered physical activity program on patterns of sedentary time in older adults.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: The negative health effects of insufficient physical activity (PA) are well-documented. Accumulating evidence suggests that total sedentary time (ST) is independently and negatively associated with many of the morbidities normally associated with lack of PA. Additional evidence indicates those who have fewer breaks in ST (i.e., longer bouts of uninterrupted sedentary time), regardless of total accumulation, are more prone to morbidity than are those with a greater number of breaks. We examined the influence of a home-based, theoretically designed PA intervention on total ST and breaks in ST in older adults.

Methods: Participants (N=307) were randomized into a 6-month home-based, DVD-delivered flexibility, toning, and balance (FTB) program, or a waitlist control. Participants completed measures during the first week (baseline), at the end of the intervention period (m6), and after 6 months without researcher contact (m12). PA and ST were measured objectively using Actigraph brand accelerometers for 7 consecutive days at each time point. Activity data were processed using a custom program written in Perl, and analyses were conducted in SPSS version 22.

Results: Analyses of covariance revealed no significant group differences in minutes of ST at m6, $F(1, 241) = .285$, $p=.60$, or m12, $F(1, 227) = .117$, $p=.68$, when controlling for baseline ST, gender, and age. Regarding the average number of daily breaks in ST, a repeated measures analysis of covariance revealed a significant effect of the intervention, $F(1,214) = 5.929$, $p=.02$, when controlling for baseline breaks, gender, and age. This was explained by a greater average number of breaks in the FTB condition at m6, $F(1,237)=3.539$, $p=.06$, and at m12, $F(1,223)=6.518$, $p=.01$.

Conclusions: Although the overall minutes of ST did not differ between groups, those that received the home-based, DVD-delivered PA intervention maintained a greater number of breaks in ST, whereas breaks decreased significantly in the control condition. These findings have implications for the design of future health behavior interventions.

02.3.5

A smartphone-based intervention to reduce prolonged sitting: The stAPP randomized controlled trial

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SIG: Yes, e- & mHealth

Awards: No

Purpose: Currently, there is a need for interventions in which participants are encouraged to reduce prolonged sitting. In this pilot study we developed 'stAPP', an innovative app for smartphones for changing sedentary lifestyle.

Methods: 58 participants (18-55 years) were recruited by flyers and e-mail and randomly assigned to a control group (CG, n=27) or an intervention group (IG, n=31). The study period lasted for 2 weeks during which sitting behavior of both groups was objectively measured by the ActivPAL. The CG was asked not to change lifestyle. The IG received the 'stAPP' system after 1 week and was asked to use it during the following week. The 'stAPP' system consisted of an app on the smartphone and a motion sensor worn on the thigh that monitored the user's sitting status. During the development of the app, the principles of the Self Determination Theory were taken into account (i.e., satisfying the needs for autonomy, relatedness and competence). The app contained persuasive design elements, e.g. graphs that visualized sitting behavior, an index reflecting how well a participant was doing, achievements, alert messages when sitting for longer than 30 minutes ...

Results: No significant changes were found in the CG for any parameter. By contrast, in the IG, prolonged sitting behavior, expressed in total minutes and % of awakening hours, significantly decreased from pre to post-test (-184.8 minutes or -50.8% on a weekday, -137.0 minutes or -47.0% on a weekend day) ($p < 0.001$, $p = 0.004$, respectively). Moreover, the number of bouts including at least 30 minutes of uninterrupted sitting behavior decreased in the IG with 2.8 on a weekday ($p < 0.001$), and with 1.9 on a weekend day ($p = 0.01$). The average duration of those bouts decreased significantly in the IG (-13.0 minutes on a weekday ($p = 0.005$), -13.2 minutes on a weekend day ($p = 0.03$)). Standing behavior, expressed as total minutes and % of awakening hours, increased significantly in the IG on weekdays (+4.2% or + 40.5 minutes, $p = 0.04$)).

Conclusions: stAPP seems to be an efficient methodology to reduce sitting behavior in adults on the short term. More research is needed to investigate the long term effects.

03.3. ORAL:

Obesity prevention in children

03.3.1

Go! Austin Vamos! Austin: A community-based health initiative

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: The Go! Austin Vamos! Austin (GAVA) project is a five year coalition driven, evidence based health initiative that targets multiple levels of health determinants for children in a low-income area of Austin with a high prevalence of childhood obesity. The evaluation aims to assess: 1) the impact of community strategies on residents' fruit and vegetable behavior and physical activity practice and 2) the impact of the implementation of GAVA on children's BMI.

Methods: The community intervention is divided into four sectors each lead by a community partner. Sectors include food, physical activity, school, and early childhood (the latter is not currently evaluated). Evaluation methods consist of 1) Cross-sectional studies, including community survey (n=149), and parent and child 5th grade dyads (n=121), 2) Cohort study using family dyads (n=157 intervention, n=150 control), 3) semi-structured community interviews from local residents (n=20) and wellness teams (n=5).

Results/findings: The results presented are the baseline data from year 1 of the door to door and intervention parents (n=306) and the fifth grade children (n=121). Participants of the door-to-door surveys and the cohort intervention group were mostly Spanish-speaking (60%), female (77%), Hispanic (80%), low-income (63% making under \$25,000 annually), and consisted of households of 5 or more (54%). Most reported they were worried about running out of the food at the end of the month because they could not afford to buy more (88%). Of the fifth grader participants, most were female (57%), Hispanic (74%) and spoke at least some Spanish at home (67%). The community interviews show emerging themes on barriers and future plans for the Dove Springs Area. Analysis is ongoing and the most up to date results will be presented at the time of the conference.

Conclusions: The unique opportunity of GAVA is being able to share the current findings from the evaluation each quarter with the implementation team. This continuous change model will hopefully become a platform and serve as an example for other communities with similar demographics (primarily low income and Hispanic).

O3.3.2

Effective implementation of the EPODE/JOGG-approach

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objectives:

Perhaps the largest programme for community-based childhood overweight prevention is the EPODE International Network. EPODE is an acronym for 'Together we prevent childhood obesity'. Our city of Zwolle is the first EPODE-city in the Netherlands, targeting children aged 4-13 years, with a special emphasis on two neighborhoods with the highest prevalence rates of childhood overweight, our 'attention neighborhoods'. Our purpose here is to discuss the 3-years evaluation, including an evaluation on childhood overweight rates, behavior and a process evaluation.

Methods:

In The Netherlands, EPODE is transformed into the JOGG-approach (acronym for youth at a healthy weight). Solid elements of the JOGG-approach are political support, public-private partnerships, social-marketing, research, and, in addition to the EPODE-approach, the linking between prevention and care. More than 5,000 children have been measured (body weight and height) from >80% of the primary schools in Zwolle and parents have filled in a questionnaire on energy-balance related behavior and environmental determinants of behavior. Further, several focus groups and interviews have been performed on several stakeholders have been performed to study process measures.

Results:

Whereas childhood overweight increased between 2006 and 2009, the prevalence of childhood overweight prevalence decreased from 13.8% in 2009 to 12.0% in 2012. Interestingly, rates of childhood overweight also decreased in the two 'attention neighborhoods'. Effects on fruits and vegetable consumption were reported but, they were less pronounced than improvements in activity levels. Participating stakeholders, in general, provided feedback to us that they had been impressed by the combination of efforts and professionals have improved professional skills in prevention. The majority of stakeholders experienced a need and desire for a sustained approach.

Conclusions:

Although we need to be careful in concluding that the EPODE-approach is successful in our town, since the evaluation period is relatively short, 3 years, and we measured overweight rates at two time-points only, the feedback we received on the large potentials to implement the approach in sustained manner, make us conclude that it is possible to adapt the EPODE-approach with showing success, and leading to a call for a sustained approach.

O3.3.3

Preliminary findings from the process evaluation of a childhood obesity prevention trial (the WAVES study)

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: The importance of process evaluation in health intervention research is increasingly recognised. A comprehensive process evaluation was designed and implemented for the West Midlands ActiVe lifestyle and healthy Eating in School children (WAVES) study intervention, a childhood obesity prevention programme for children aged 6-7 years, delivered in UK primary schools (n=24).

Methods: Data on six dimensions (Fidelity, Reach, Recruitment, Quality, Participant Responsiveness and Context) were collected. The evaluation focused on three elements of the intervention where delivery may have differed across schools: additional daily school-time physical activity (PA), three cooking workshops (CW) for children and parents, and Villa Vitality (VV), a 6-week healthy lifestyle promotion programme run by a local football club. The process evaluation was undertaken in five stages: (i) Data collection - logbooks, observations, interviews, focus groups and questionnaires. (ii) Consolidation and tabulation - data were stratified by process evaluation dimension and intervention component for each school. (iii) Initial score allocation and discussion - for each intervention component two researchers independently allocated schools a score on a 5-point Likert scale for each dimension (Fidelity, Reach, Recruitment, Quality and Participant Responsiveness) (maximum score per component, 25, maximum score overall, 75). Context was assessed separately. The researchers then discussed score allocations for each school and reached a consensus. Schools were ranked by total score, and then grouped, to reflect low, medium or high intervention implementation. (v) Consultation and final score allocation - a wider team of researchers (n=5), who had a working knowledge of intervention delivery reviewed, and agreed a final score allocation.

Results: Median total process evaluation score across schools was 56 (IQR, 51.0 - 60.8). For the PA intervention element most schools were considered to be low-implementers (n=13), four were high-implementers. Most schools (n=17) were high-implementers for the VV intervention element. There were eleven high-implementer and nine low-implementer schools for the CWs.

Conclusions: The results will inform future intervention design and help to contextualise the findings of the main trial. A methodical, replicable approach to analysis of process evaluation data has been developed, which could be used to guide analysis of process evaluations in future intervention research.

O3.3.4

Sociological resignation and cultural essentialism among health care professionals working with early overweight

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose:

Childhood obesity has been an increasing problem in the Western world during the second half of the 20th Century and poses a great public health challenge with no signs of reversal. The highest rates of overweight are to be found among groups with low socio-economic status and among immigrant populations from non-Western countries. Most research on interventions to counter early overweight has focused on parents' role, and little knowledge exists on how health care professionals approach the problem and the families involved. The purpose of this study is to explore these perspectives and analyze how approaches might affect treatment, especially of underprivileged, high-risk groups among pre-school children.

Methods:

This study is based on qualitative research interviews with 20 Danish health care professionals, working with interventions targeted overweight pre-school children. Field work was exploratory and a grounded theory approach was adopted. Interviews were recorded and transcribed verbatim. Audio and transcripts has been compared to ensure the quality. The first phase of the data analysis was exploratory as well and topics appearing in interviews structured a preliminary analysis. Afterwards all interviews were coded in NVivo by nodes defined by the initial results to secure validity and reliability.

Findings:

The findings suggest that professionals' understandings of early overweight are shaped by a shared discourse on appropriate parenting (echoing the scientific model of parenting styles): Parents to overweight pre-school children are seen as incapable to act demanding. Parental incapability was perceived to be greatest among ethnic minorities and the discourse of parenting was entangled with a *cultural essentialism*. Culture was seen as a barrier for change, and this created a reluctance to start interventions. Cultural essentialism was for some professionals combined with a *Sociological resignation*: A strong sense of the hardships related to migration and underprivileged status, seemed to create a sense of powerlessness among professionals.

Conclusion:

The findings suggest that perceptions among health care professionals can work as a social level barrier for initiating interventions targeting early overweight.

O3.3.5

Coming to terms with the limited effectiveness of community-based interventions for childhood obesity

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SIG: Yes, Policies and environments

Awards: No

Objective:

Many community-level interventions have tried to tackle childhood obesity; these form the subject of several reviews and meta-analyses. The results make unhappy reading: differing views as to effectiveness, but broad agreement that effect-sizes are small even where they exist; limited consideration of possible side-effects; little consideration of cost-effectiveness; hardly any consideration of the opportunity costs; limited documentation and community-specificity hamper reproducibility. Given this background, it is worth stepping back to reconsider the limits, costs and purposes of community-level interventions.

Methods:

Drawing on the large and patchy evidence base around such interventions, the paper takes an explicitly theoretical and normative perspective. Why have interventions had such limited (if any) effects on obesity rates? Does it make sense to pursue community-based interventions, whether in terms of further research or as a matter of public policy?

Results:

No empirical results will be presented. Instead, the paper will evaluate the following possible responses to the questions indicated. (1) Since the evidence is mixed and inadequate, further research is needed, especially on longer-term, multi-dimensional interventions. (2) Following (1), one might also argue that the problem is so urgent that policy-makers should still endorse such interventions, pending more definite findings. (3) Alternatively, one might judge that there is now sufficient evidence that community-level interventions have minimal effects; therefore we should therefore abandon such interventions both as matters of research and policy.

Conclusions:

The paper will argue that community-level interventions are not worthwhile *if considered solely in terms of reducing obesity rates*. But there may be other arguments, e.g. in terms of community empowerment, specific community needs or awareness-raising, to support specific subtypes of intervention. Nonetheless, the track-record of community interventions basically supports the widely accepted view that significant infrastructural and economic changes are required to change the sorts of behaviour at issue. Efforts should therefore be targeted at the policy level. However, straightforward evidence for direct effects of policy changes is none-too-strong; to support such changes, we need to consider other valuable goals that can be served by possible policy measures, and build wider coalitions.

O4.3. ORAL: Physical activity environment in adults

O4.3.1

Active Parks: Community Use and Perceptions

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SIG: Yes, Policies and environments

Awards: No

Objective: To address the need for greater access to exercise facilities in communities, many municipalities have begun to add adult exercise equipment to outdoor parks, creating “active parks”. However, there is little research to inform policy-makers whether active parks have a positive impact on the community. Thus, the purpose of this study was to examine the use, awareness, and perceptions of two active parks in a small Canadian city

Methods: To objectively assess usage the System for Observing Play and Recreation in Communities was used to directly observe the 2 active parks and 4 control parks without exercise equipment. Observations were conducted in 2 seasons (summer and autumn) and were systematically rotated to include morning, afternoon and evening periods over 3 weekdays and 2 weekend days. To examine community awareness and perceptions we conducted intercept interviews with adult park users and residential interviews at a random sample of homes within 1km of the active parks. Quantitative data from observations and interviews were analysed using SPSS and qualitative interview data were examined using thematic analysis with NVivo.

Results: Less than 10% of park visitors used the exercise equipment and there was no significant difference in park use between active and control parks. A total of 133 interviews have been conducted to date; 50 intercept and 83 residential. 87% of those interviewed were aware of the equipment but 77% reported using it “rarely or never”. There was no significant difference in self-reported physical activity between those who indicated they use the exercise equipment and those who don’t. Qualitative data revealed that most people identify benefits to the active parks, which were represented by 3 major themes: health, accessibility, and community wellness. Several limitations to use of the equipment were reported and the primary themes identified were usability (location and type of equipment) and awareness of how to use the equipment.

Conclusions: Active parks are a novel initiative to increase physical activity. Our results suggest that while they are generally perceived as beneficial to the community, they are seriously under-utilized. Enhancing motivation and education were identified as potentially important strategies to increase use.

O4.3.2

What specific types of destinations have greatest influence on local walking? A multilevel study

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

While neighbourhood destinations have been shown to be associated with walking; little is known about which specific types of destination (e.g. shops, services) are most influential and whether having access to a mix of destinations is important. This study examined the associations between walking frequency, and types and mix of destinations.

Methods:

The sample consisted of 2349 residents of 50 urban areas in metropolitan Melbourne, Australia. Seven destination types (supermarkets, small food stores, transport stops/stations, community resources, cafes and takeaway food stores, sporting facilities, and educational facilities) were geocoded using geographic information systems. Destinations were examined within three network buffers (400metres (m), 800m and 1200m) from each respondent’s home. Multilevel logistic regression was used to estimate the effect of each destination type separately, as well as destination mix (variety) on likelihood of walking for at least 10 minutes, at least 1/week. All models were adjusted for potential confounders.

Results/findings:

All destinations types were positively associated with walking frequency at 1200m. For the 800m buffer cafes/takeaway stores, transport stops, supermarkets, community resources and small food stores were positively associated with walking frequency; at 400m buffers, café/takeaway food stores and transport stops were associated with walking. For all buffer distances, greater mix of destinations was associated with more walking.

Conclusions:

This study provides evidence that destinations influence walking behaviour and that this varies by type within varying distances from people’s homes. Supermarkets, community resources and small food stores showed the strongest associations with walking: significant effects being observed at both the 800m and 1200m buffer. There is also evidence that greater mix of destinations positively predicts walking frequency. This evidence is critical for urban planners in the development of more pedestrian-friendly, health promoting neighbourhoods.

O4.3.3

Assessing the impact of built environment change on physical activity and related health outcomes

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SIG: Yes, Policies and environments

Awards: No

Purpose:

Relationships between built environment characteristics and health outcomes have been established in academic research over the past two decades. Several California metropolitan planning organizations (MPOs) have expressed a desire to use this research to integrate assessment of health impacts into their planning practices. The aim of this analysis was to calibrate models using local data and incorporate them into UrbanFootprint (UF) software, a scenario development and analysis tool used by state and regional agencies, allowing planners to predict contrasting levels of physical activity (PA), obesity, and chronic disease resulting from alternative land use and transportation investment proposals.

Methodology:

Models were derived from California-based data sources including the California Household Travel Survey (CHTS), California Health Interview Survey (CHIS), US Census, and local transportation system, land use, and employment data. Built environment variables were calculated for 1km buffers surrounding each 150x150m grid cell in the 30-county study area, then joined to survey participants' geocoded residences. Large sample sizes (CHTS, n=53,733; CHIS, n=40,617) allowed models to be calibrated for four age cohorts, and for the adult cohort, for three income groups. Models were developed for four CHTS travel behavior and PA outcomes and 13 CHIS PA, obesity, and health outcomes (high blood pressure, heart disease, type 2 diabetes, self-reported general health). Regression methods included linear, binary logistic, and Poisson. All models adjusted for demographic/socioeconomic covariates; obesity models adjusted for PA; and health outcome models adjusted for PA and obesity.

Results:

Models were programmed into UF software and sensitivity tests were conducted, comparing predicted outcomes assuming current built environment characteristics to an alternative scenario where each built environment variable was modified by one decile in the presumed healthful direction (e.g. better walkability index, transit access, and park access). For adults, this resulted in 19% more transportation-related PA minutes, 3% more recreational PA minutes, 3% lower obesity prevalence, 1% lower heart disease prevalence, and 3% lower type 2 diabetes prevalence.

Conclusion:

Integrating travel behavior, PA, and health metrics into scenario planning software allows MPOs to evaluate health impacts of Regional Transportation Plan / Sustainable Communities Strategy updates for the first time.

O4.3.4

Safe RESidential Environments? A longitudinal analysis of the influence of crime-related safety on walking.

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Intuitively we expect the perception of an unsafe neighbourhood will cause residents to constrain their local walking. A large number of cross-sectional studies have investigated this premise; however the findings to date are largely inconclusive. In contrast, few longitudinal or prospective studies have examined the impact of crime-related safety on residents walking behaviours. This study used longitudinal data to test whether there is a causal relationship between residents' perceptions of crime-related safety and walking in the local neighbourhood.

Methods: RESIDE participants in Perth, Australia completed a questionnaire before moving to their new neighbourhood (n=1813) and again approximately one (n=1467), three (n=1230) and seven years (n=565) after relocating. Self-report measures included neighbourhood perceptions (modified NEWS items) and walking inside the neighbourhood (min/week). Objective environmental measures were also generated for each participant's 1600m neighbourhood at each time-point. The impact of crime-related safety on walking was examined in SAS using the Proc Mixed procedure (marginal repeated measures model with unrestricted variance pattern). Initial models controlled for demographics, time and self-selection, and subsequent models progressively adjusted for other built and social environment factors based on a social ecological model.

Results: For every increase of one level on a five-point Likert scale in perceived safety from crime, total walking within the local neighbourhood increased by 18.0 min/week (p=0.000). This relationship attenuated to an increase of 10.5 min/week after accounting for other built and social environment factors, but remained significant (p=0.008). Further analyses examined transport and recreational walking separately. In the fully adjusted models, each increase in safety from crime was associated with a 7.0 min/week increase in recreational walking (p=0.009), however findings for transport walking were non-significant.

Conclusions: This study provides longitudinal evidence of a potential causal relationship between residents' perceptions of safety from crime and recreational walking. Safety perceptions appeared to influence volitional walking, rather than utilitarian walking. Given the popularity of recreational walking and the need to increase levels of physical activity, community social and physical environmental interventions that foster residents' feelings of safety are likely to increase recreational walking and produce public health gains.

04.3.5

Mediating relationship of gender, campus walkability/bike-ability, college students' physical activity attitudes and behaviors on their body mass index.

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: What are the mediating factors between the walkability/bike-ability of the college campus environment and young adults' physical activity attitudes, behaviors, and body mass index (BMI)?

Methods: Based upon Social Cognitive Theory (environment, intentions, behaviors), path analysis with bootstrapping was applied to walkability/bike-ability environmental scores for 13 college campuses and 1389 student participants' physical activity attitudes and behaviors and BMI. Height and weight were measured and students completed online surveys. The Physical Activity Behavior Questionnaire assessed outcome expectations, self-regulation, and personal barriers. Stages of change for physical activity assessed pre-contemplation, contemplation/preparation, or action/maintenance of students for completing regular, planned physical activity five times per week for 30 minutes. Walking, moderate, and vigorous intensity physical activity Metabolic Equivalents (METs) per week were determined with the International Physical Activity Questionnaire. Walkability/Bike-ability was assessed for an average of 44 path segments per campus. Each path was scored on 12 criteria regarding path safety, quality and comfort.

Results: The overall model fit was good with chi-square of 171.388 (n=1389, df=18), $p < .001$, Comparative Fit Index value of .95, and a root mean square of approximation of .079. After controlling for gender, there was a direct negative association between Walkability/Bike-ability campus score and BMI ($\beta = -.085$), and positive association between personal barrier and BMI ($\beta = .134$). Walkability/Bike-ability campus score was positively associated with walking intensity physical activity METs ($\beta = .010$). Self-regulation and physical activity stage of change were positively associated with moderate intensity physical activity METs ($\beta = .213$, and $\beta = .078$, respectively), which, in turn, was negatively associated with BMI ($\beta = -.057$).

Conclusions: The ease of walking and biking on a campus relates to college students' walking intensity and their weight/BMI. Students' stage of change and behavioral intentions regarding physical activity were associated with moderate physical activity and reduced weight. As perceived barriers for physical activity increase so does BMI. These results provide evidence to focus interventions and policies for healthful environmental changes to supplement and enhance interventions encouraging individual behavior change for physical activity and weight management.

05.3. ORAL:

Determinants of physical activity and sedentary behavior

05.3.1

Life course predictors of adulthood TV viewing and physical activity: the 1970 British Cohort Study

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose:

Few studies have examined life course predictors of adulthood sedentary behavior and physical activity. The aim was to examine parental and childhood correlates of adult TV viewing time and physical activity over 32-years follow-up in the 1970 British Cohort Study (BCS70).

Methods:

BCS70 is a longitudinal observational study of 17,248 British people born in a single week of 1970. The present analyses incorporated data from the age 10-year and 42-year surveys. When participants were aged 10 years, their mothers provided proxy information on TV viewing and sports participation (never/sometimes/often), and parents' own occupation, as well as height and weight. At follow-up, (aged 42 survey) participants reported their daily TV viewing hours, frequency of participation in 15 types of physical activities, and health status.

Results/findings:

Data were available in 6,188 participants. Participants who reported 'often' watching TV at baseline were significantly more likely to watch >3hr/d of TV at follow-up (multivariable adjusted odds ratio [OR] 1.42, 95% CI 1.21 to 1.65); fathers BMI when the child was aged 10 was positively associated with high TV in adulthood (per unit increase; OR 1.04, 95% CI, 1.02 - 1.06) after adjusting for participants own weight status; participants with fathers from a lower socio-occupational class (intermediate, routine/manual) compared to managerial (OR 1.55, 95% CI 1.14 to 2.11; OR 2.05, 95% CI 1.47 to 2.87) reported higher TV in adulthood. Adjustment for participants' highest educational attainment at age 42 did not alter the results. Participants who often participated in sports at age 10 were significantly more likely to participate in sport/ physical activity at age 42 (OR 1.18; 95% CI 1.06 to 1.31). Fathers social status was not associated with participants adulthood physical activity levels after adjustment for their own educational attainment.

Conclusions:

Findings suggest that childhood behaviors track into adulthood. Parents' health behaviors and social position appear to be associated with their children's viewing habits later in life. Intervention in early years may have the most potential to bring about lasting changes.

05.3.2

Biological, socio-demographic, work and lifestyle determinants of sitting in young adult women: a prospective cohort study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Evidence on the health risks of sitting is accumulating. However, research identifying factors that influence sitting, and the most at risk groups, is limited, especially in young adults. The aim of this study was therefore to examine the biological, socio-demographic, work-related and lifestyle determinants of sitting time in young adult Australian women.

Methods: Self-reported data from 11,676 participants (aged 22-27 years in 2000) in the Australian Longitudinal Study on Women's Health were collected over 9 years in 2000, 2003, 2006 and 2009. Generalised Estimating Equations were used to examine associations of body mass index, country of birth, area of residence, education, marital status, number of children, occupational status, working hours, physical activity, smoking, alcohol intake and stress with week- and weekend-day sitting time expressed in hours per day (h/day).

Results: On average, week-day sitting time was 6.5 h/day in 2000 and declined slightly over time to 6.2 h/day in 2009. Weekend-day sitting time also declined over time; from 5.5 h/day in 2000 to 5.0 h/day in 2009. The percentage of women sitting >7 h/day ranged from 36 (2009) to 41 (2000) on weekdays and from 17 (2009) to 23 (both 2000 and 2003) on weekend-days.

Compared with women in the respective referent categories, (1) women with higher BMI, those born in Asia, those with less than University level education, doing white collar work, working 41-48 hours a week, current smokers, non, rare or risky/high risk drinkers and those being somewhat stressed had significantly higher sitting time; and (2) women living in rural and remote areas, partnered women, those with children, those without a paid job and blue collar workers, those working less than 34 hours a week, and physically active women had significantly lower sitting time.

Conclusions: This study showed that many young women spend a substantial proportion of their waking hours sitting. Women with higher BMI, women born in Asia, those with higher level occupations and long working hours, were most at risk of higher sitting time. These results can be used for the identification of at-risk groups and improving intervention development.

05.3.3

More crime, more sitting? Longitudinal evidence from 51,222 Australians

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Background

Changes in neighbourhood crime may discourage physical activity and, consequently, increase the propensity for sedentary lifestyles. Previous research, however, has tended to rely on cross-sectional data and perceptions of crime, rather than longitudinal studies of reported crime rates. Furthermore, different types of crime may have different impacts on the propensity for sedentary behaviour. Accordingly, we examined whether changes in sitting time were associated with a change in multiple indicators of neighbourhood crime around participants aged 45 years and older who remained in the same neighbourhood between 2006 and 2010.

Methods

Fixed effects linear regression was used to assess the degree of association between self-reported sitting time and five tertile-based measures of neighbourhood crime sourced from the NSW Bureau of Crime Statistics and Research: non-domestic violence; malicious damage; break and enter; stealing, theft and robbery; and an aggregated 'total crime' indicator. Gender-stratified analyses were fitted for 24,053 men and 27,169 women, adjusting for time-variant confounders that are known to determine household relocation and participation in sedentary lifestyles (age, income, economic status, couple status, and physical health).

Results

Fully adjusted models indicated an increase in sitting time was associated with an increase in neighbourhood crime for men and women. An increase in non-domestic violence from tertile 1 (low) to tertile 3 (high) coincided with $\beta=0.41$ (95% confidence interval (95%CI) 0.23, 0.59) in sitting time among men and $\beta=0.23$ (95%CI 0.08, 0.39) among women. Larger effect sizes were observed for a tertile 1-to-3 increase in malicious damage for men ($\beta=0.62$ 95%CI 0.49, 0.76) and women ($\beta=0.49$ 95%CI 0.38, 0.61).

Conclusion

Overall, the results indicate that investments in crime prevention are also potential investments in healthy liveable communities. Increasing levels of neighbourhood crime, particularly types which influence the local built environment, may discourage active lifestyles and increase sedentary behaviour. Future research might consider exploring how different types of local crime prevention initiatives influence active lifestyles, while other work is needed to investigate whether similar patterns are observed among adults under 45 years of age.

O5.3.4

Is it me or my surroundings? An integration of social-cognitive and perceived environmental factors associated with physical activity among community-dwelling older adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Neighbourhood environments can support or hinder physical activity especially as health declines with age. The present study aims to examine how individual-level factors, derived from health behavior theories, interact with environment-factors associated with physical activity in older adults who live in a highly walkable neighbourhood.

Methods: The Active Streets, Active People study recruited 193 older adults (≥60 years) living near a planned greenway development in Vancouver, British Columbia. Participants completed self-reported questionnaires on attitudes to walking, gait efficacy, and social support, as well as neighbourhood satisfaction. To assess physical activity, participants wore an ActiGraph GT3X+ accelerometer on their right hip (activity measured in 60s epochs) for 7 days (right hip) during September to October 2012. We applied standard wear time definitions to accelerometry data (≥600 minutes/day on ≥3 days, allowing for <2 consecutive minutes of <100 counts/minute) and calculated mean daily minutes spent in moderate-to-vigorous physical activity (MVPA; Freedson 1998 cut-points ≥1952 CPM). To test whether neighbourhood satisfaction moderated the association of individual-level variables with physical activity we estimated multiple linear regression models with interaction terms.

Results: In total, 173 had valid accelerometry data [mean age (SD) 70.4 (7.2) years] and demonstrated high levels of daily moderate-to-vigorous physical activity [mean (SD) 39.7 (34.1) minutes/day]. Individual-level factors significantly associated with MVPA were age ($B = -6.7$, $p = 0.01$) and attitudes towards walking ($B = 57.9$, $p = 0.03$). Neighbourhood satisfaction moderated the association between gait efficacy and MVPA ($B = 31.0$, $p = 0.04$), with stronger associations between gait efficacy and MVPA in individuals with higher levels of neighbourhood satisfaction. Social support was not associated with physical activity. Overall the model explained 21% of the variance in MVPA.

Conclusions: Our findings suggest that feeling confident about walking ability is not sufficient to encourage physical activity. Only if individuals are satisfied with their neighbourhood, in terms of access to public transport, entertainment facilities, as well as ease and pleasantness of walking opportunities, will this translate into actual behavior. By integrating environmental and individual correlates within a theoretical structure we can better understand the mechanisms through which the environment influences physical activity levels.

O5.3.5

Patterns of GPS measured time outdoors and objective physical activity in adults with newly diagnosed type 2 diabetes

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

Observational studies in children suggest that time spent outdoors is associated with higher physical activity, and increasing time outdoors may thus be a suitable target for intervention. The contribution of time spent outdoors to physical activity in adults with type 2 diabetes is not known. The aim of this study was to investigate whether GPS recorded time outdoors was associated with objectively measured physical activity in adults with newly diagnosed type 2 diabetes.

Methods:

Participants were 49 adults (53% male), mean age 55.8 ± 8.0 years recruited from primary care in South West England between January and November 2014. Physical activity was measured by accelerometry (Actigraph GT3X) and participants wore a GPS receiver (QSTARZ BTX1000) during waking hours for seven days. Accelerometer and GPS data were combined to describe the patterns and locations of physical activity every 10 seconds where both a GPS and accelerometer record were present. Accelerometer counts exceeding 382 per 10 second epoch were coded as moderate-to-vigorous physical activity (MVPA) and each GPS data point was coded as "indoors" or "outdoors" using satellite strength. Data recorded at speeds ≥ 15 kph was discarded as being in motorised transport. Linear regression analyses were used to examine the cross-sectional associations between GPS measured time outdoors and physical activity, adjusting for age, sex, and body mass index.

Results:

Participants recorded 156.1 ± 88.3 minutes (19.2 ± 10.8 % of recorded time) each day outdoors. Overall, participants accumulated 26.6 ± 19.0 minutes of MVPA per day, of which 17.9 ± 17.3 minutes was outdoors (61.8 ± 23.8 % of total MVPA). A one hour increase in time outdoors was associated with an additional 4.2 minutes of MVPA (adjusted β : 0.072 minutes, 95% CI 0.003, 0.143; $p = 0.041$).

Conclusions:

Time spent outdoors is associated with higher levels of physical activity in adults with newly diagnosed type 2 diabetes. Increasing outdoor time should therefore provide a target for intervention. However, the amount of time spent in MVPA when outdoors is relatively small, and further studies are required to describe what activities contribute to outdoor MVPA and how these may be increased in people with diabetes.

O6.3. ORAL: Food and nutrition environment

O6.3.1

Improving school meal quality in Sweden using a combination of legislation and practical tools

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SIG: Yes, Policies and environments

Awards: No

Purpose: Free school lunches are provided to all school children in Sweden but evaluation of this policy has been almost non-existent partly due to lack of data. In 2011 new legislation explicitly required that school lunches be nutritious, and in 2012 we launched a novel instrument to help schools evaluate and improve their own school meal situation. This presentation will provide evidence that both of these strategies have had a positive effect.

Methods: A unique web-based instrument to measure school meal quality from a holistic perspective (covering topics from nutritional quality, to service/integration with the school day, to environmental impact) was developed and validated. Schools evaluate their meals with this practical tool and receive automatic feedback. Study A: Longitudinal study of a representative random sample of 97 schools who used the instrument at baseline (2011, prior to the new law) and at follow-up (2013). Study B: Two cross-sectional studies during the school years 2012/3 and 2013/4. Study C: A longitudinal study of 290 schools who have used the instrument more than once.

Results: Study A: Between 2011 and 2013, nutritional quality improved overall in this school cohort. Adherence to some serving guidelines and nutritional standards improved significantly. Study B: Significant improvements in nutritional quality were seen, but no improvements in other quality areas were detected. Adjusting for year of use, significant improvements in nutritional quality and "service" quality were seen in schools who had used the instrument repeatedly compared to those who had used it only once. Study C: Schools who use the instrument more than once significantly improved nutritional quality.

Conclusions: The law and resulting initiatives has led to an improvement in school meal quality. The effects of a new school meal policy are difficult to evaluate and more efforts should be made to plan for evaluation when proposing changes. The instrument is widely used and feasible, providing much needed data on school meal quality, and appears to be effective in improving school meal quality. In summary, both approaches can work and could have implications for other countries wishing to improve school meal quality.

O6.3.2

Persisting social inequalities in adolescents' nutrition patterns: an explanation

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective: Despite the establishment of highly developed welfare regimes socioeconomic inequalities in health persist and even widen in Western Europe. Two hypotheses on the explanation of this paradox were formulated. The first hypothesis states that lower social strata have become more exclusively composed of individuals with personal characteristics that increase the risks of ill-health (social selection theory). The second is that advanced welfare states have now reached the fourth stage of the epidemiological transition in which health improvement depends to a large extent on behavior change, which in turn may have increased the importance of immaterial factors like cultural capital (capital theory). The present research aims to review the second hypothesis in the context of nutrition patterns.

Methods: Data from the 2013/14 Flemish (Belgium) Health Behaviour among School-aged Children (HBSC) survey was used (n=1978). Indicators for both absolute and relative wealth were used to measure economic capital. Social capital was assessed by structural and cognitive components of family social capital, a four-factor school social capital scale and a cognitive community social capital scale. Both institutionalized (educational level) and embodied cultural capital (cultural participation) were considered. A cross-classified multilevel model was estimated using MLwiN 2.25 software.

Results: In general, results showed that components of economic, social and cultural capital independently related to nutrition patterns (p<0.05). Few interpretable interactions were found. The interplay between economic and cultural capital accounted for unequal nutrition patterns (p<0.05). Having a parent with a higher educational degree (college or university) amplified the positive association between adolescent's absolute family wealth and healthy eating patterns.

Conclusion: Capital theory may explain how the association between socioeconomic status and health is reproduced over time.

O6.3.3

CHANGE4LIFE SMART SWAPS : QUASI-EXPERIMENTAL EVALUATION OF A NATURAL EXPERIMENT

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SIG: Yes, Policies and environments

Awards: No

Objective:

Change4Life is Public Health England's social marketing campaign, providing public-facing support to combat rates of obesity in England. Change4Life Smart Swaps was launched in January 2014. Families were encouraged to make small changes in their food and drink purchases by substituting lower fat or lower sugar versions of commonly eaten foods and drinks. This study aimed to evaluate the impact of the "Smart Swaps" intervention by looking at the levels of swaps made amongst those signed up to the intervention versus those who did not.

Methods:

Data were obtained using a mobile phone "app" questionnaire. The intervention group (n= 267) consisted of families who had signed up to the Smart Swaps campaign which was promoted through various media, including TV and radio advertising in early 2014. The comparison group (n=135) were families resident in Wales who had previously signed up for Change4Life materials but were not directly exposed to the Smart Swaps campaign in 2014. For three weeks, participants were asked specific questions about their purchases of dairy products, carbonated drinks or breakfast cereals and were asked to record these each time they made a purchase within the category, including taking a photograph for validation. They completed three surveys, one week into the campaign then two and three weeks later.

Results:

No significant differences between the intervention and comparison groups were seen during the first week. However, after two and three weeks a significantly higher percentage of the intervention group had made «smart swaps» than the comparison group. After three weeks, 58% of participants had swapped to a lower fat dairy product compared to 26% of the comparison group ($p<0.001$), 32% of the intervention group had purchased a lower sugar carbonated drink compared with 19% of the comparison group ($P=0.01$), and 24% had made a change to a lower sugar cereal compared with 12% of the comparison ($P=0.009$).

Conclusions:

In the short term a national campaign to change purchase habits towards healthier products may have some merit but further follow-up would be necessary to measure the sustainability of change prompted by such a campaign.

O6.3.4

'I just choose the one I feel like'. Exploring food shopping practices and consumer perceptions of influences on food purchase in a Danish supermarket intervention setting (working title)

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Studies exploring health behavior and intervention potentials in real-life food environments such as supermarkets are limited. Qualitative research on target group, problem and context of health promotion interventions might increase success of interventions. This qualitative study contributes by empirically and theoretically exploring consumer food shopping practices and perceptions of factors influencing food purchase in a supermarket intervention setting.

Methods: Explorative qualitative study based on data from 57 short in-store interviews, 11 in-depth telephone interviews and three focus group discussions. Data was collected at baseline and during the intervention phase of the "Health and Local Community" Project in three villages on the Danish island of Bornholm. Thematic Analysis was used to analyze data within a theoretical framework based on Practice Theory and Behavioral Economy.

Results: Data suggested that food shopping practices could be grouped into four routinized ways of engaging in food shopping activities: planned, challenged, hedonistic/impulsive and automatic pilot. These four performance types were not mutually exclusive. Performances differed in aspects such as planning, price, health, convenience and how purchase intentions were put into practice. Preferences, price and habits were perceived by informants to be the strongest drivers for food purchases, but many examples of how in-store cues influenced food shopping in healthy and unhealthy ways were identified in data. Susceptibility to supermarket cues seemed most strongly connected to challenged and hedonistic/impulsive food shopping performances.

Conclusions: Real-life food shopping behavior is neither always ideally rational, nor are food shoppers unreflective victims controlled entirely by habits or supermarket cues. Rather, food shopping performances arise from dynamic interactions between personal, resource-related and contextual factors. Health promoters might help narrowing the gap between healthy purchase intentions and routinized performances by developing in-store interventions based on knowledge of target group practices and choice architectural tools. Mixed intervention strategies targeting different performances could be applied, e.g. candy-free check-outs for challenged shoppers, product displays signaling pleasure for hedonistic/impulsive shoppers and catch-all promotions suggesting affordable, convenient and healthy meals. Despite health promotion potentials in supermarket settings, interventionists should bear in mind the many environmental, structural and socio-cultural barriers to healthier food shopping practices.

O6.3.5

Supermarket scan data can characterize the consumer food environment

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Studies of the retail food environment often rely on types of stores to judge their healthfulness. Supermarkets, which are generally considered healthful as they offer a wide range of healthy foods, also offer many unhealthy ones. Food environment measurement could be improved by considering the availability of food inside the supermarkets. Supermarket scan data are a novel way to estimate this. Study objectives are to develop geographical indicators using supermarket scan data and to evaluate the accuracy of this commercial data source to measure the consumer food environment.

Methods: The Nielsen MarketTrack database provided annual sales and physical volumes for 97 food categories available at the national level but also partitioned by forward sortation areas for 2/3 of supermarkets in Québec from 2010 to 2014. Food categories included vegetables and fruits; milk, soya drinks, infant formula, yogurt, and cheese; bread, pasta, rice, and cereal; meat, seafood, fish, eggs, tofu, beans, and peanut butter; juices, fruit beverages, soft drinks, and energy drinks; snack food and candy; ready-to-eat foods. Data accuracy was estimated by comparing data to Québec databases from the Ministry of Agriculture and Statistics Canada.

Results: Three types of indicators were developed: food groupings, top selling categories, and nutritional quality. By geocoding supermarkets, it was possible to calculate trends in volume sold, in price and in nutritional quality at the national and local levels. For example, between 2010 and 2014, regular and diet soft drinks volumes declined while fruit juice and energy drinks remained stable and fruits drinks increased. According to the different methods used, the database covers approximately 50 % of foods sold in Québec, which is lower than the proportion of all food bought in supermarkets of 65 %. Database coverage is the highest for vegetable and fruits and the lowest for bread and cereal products.

Conclusions: Food environment indicators developed in this project were incorporated in a dynamic web-mapping application where they are used and linked to socioeconomic and built environment information. Public health professionals in Québec have access to this information to better orient their interventions by identifying regional priorities and contexts.

O7.3. ORAL:

Active transport and infrastructures in adults

O7.3.1

Theorising and testing environmental pathways to behaviour change: the perception and use of new infrastructure to promote walking and cycling in local communities

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Some studies have assessed the effectiveness of environmental interventions to promote physical activity, but few have examined how such interventions work. We aimed to investigate the environmental mechanisms linking an intervention designed to promote walking and cycling with behaviour change.

Methods: We used data from the iConnect study, a natural experimental study of adults living within 5km of new walking and cycling infrastructure in three UK municipalities (Cardiff, Kenilworth and Southampton). Exposure to the intervention was defined in terms of the distance from each participant's home to the nearest access point. Questionnaires at baseline and two-year follow-up assessed perceptions of the supportiveness of the specific environment targeted by the intervention, use of the new infrastructure, and walking and cycling behaviours. Analysis proceeded via factor analysis of perceptions of the physical environment (step 1), and regression analysis to identify plausible pathways involving physical and social environmental mediators and refine the intervention theory (step 2), to a final path analysis to test the resulting model (step 3).

Results: We identified two physical environment factors, which we described as representing perceived changes in infrastructure and perceived changes in safety (step 1, n=1211). Participants who lived near and used the new routes reported increases in their perceptions of infrastructure provision and of the safety of walking and cycling, as well as of the visibility of these behaviours. As a result, these variables met the criteria for entry into the model as candidate mediators of intervention effects. However, path analysis (step 3, n=967) showed that the effect of the intervention on changes in overall time spent walking and cycling was largely (90%) explained by a simple causal pathway involving use of the new routes, and other pathways involving changes in environmental cognitions explained only a small proportion of the effect.

Conclusions: Physical improvement of the environment itself appeared to be key to the effectiveness of the intervention, whereas seeking to change people's cognitions regarding the environment may be of more limited value. Studies of how interventions lead to behaviour change should complement those concerned with estimating their effects in supporting valid causal inference.

07.3.2

Understanding how new infrastructure acts to promote cycling: testing theories using quantitative mediation analysis

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

There is some evidence on the effectiveness of environmental interventions on physical activity; however our understanding of how such interventions work is limited. Socio-ecological frameworks hypothesize that perceived environmental and cognitive factors may be part of such mechanisms. We used data from a natural experimental study of new public transport, walking and cycling infrastructure to examine the potential mediating pathways to behaviour change.

Methods:

Baseline (2009) and follow-up (2012) data were used from the Commuting and Health in Cambridge study (UK), a study of 470 adults who worked in areas of the city served by the new infrastructure. Exposure to the intervention was defined in terms of residential proximity. At both time points, questionnaires assessed participant's perceptions of the supportiveness of the physical and social environment, use of the infrastructure (mediators) and time spent cycling on the commute (outcome). Change in cycling time was categorised as increased, decreased and no change. Regression analyses were used to identify potential combinations of mediators which formed pathways from exposure to outcomes and these pathways were subsequently tested in a path model. We also investigated differences in mechanisms between low and highly active commuters at baseline.

Results:

Changes in perceived traffic, convenience of public transport and cycle routes, and self-reported use of the cycle path were identified as potential mediators ($p < 0.05$). However, in the path analysis the effects of the intervention on increases in cycling were largely (86%) explained by a use of the new routes. In stratified analysis, these findings were mirrored in both groups, however in the high active group, the pathway through use explained both increases and decreases in cycling.

Conclusions:

Although changes in perceptions were associated with exposure and outcome, they did not contribute to explaining the effect in this analysis; use of the path explained both increases and decreases in cycling. A decrease of cycling was only observed among highly active commuters at baseline. Reasons for this may be a more efficient route to cycle (decreasing active commuting time) or increased use of public transport features associated with the intervention. Future research should aim to understand these hypotheses.

07.3.3

What numbers don't tell you: using a mixed-method approach to evaluate the impact of new infrastructure for walking and cycling

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Natural experimental studies that evaluate changes to the environment can provide important insight into the causal relationship between the built environment and walking and cycling. To enhance our understanding, these studies should go beyond estimating whether the intervention was effective (investigating outcomes) to explore the mechanisms underlying intervention effectiveness and the contexts in which a given intervention was (or was not) effective.

These analyses form part of the iConnect study, which evaluated walking and cycling infrastructural projects in Kenilworth, Cardiff and Southampton in the UK. Through utilising both qualitative and quantitative data, the purpose of this paper is to explore the mechanisms underlying, and the context determining, the project outcomes. We have already published our main outcome analysis showing a significant increase in time spent walking, cycling and in overall physical activity after two years, but usage varied between sites and 34% of survey respondents used the new routes for recreation compared with 14% for transport.

Methods: We conducted parallel analyses of (a) qualitative stakeholder (n=17) interview data on proposed mechanisms and context and (b) quantitative data on changes in residents' (n=1490) perceptions of the neighbourhood and route environments. Convergent integration of the two analyses was used to explain the observed patterns of awareness and use of the infrastructure.

Results: Qualitative data revealed subtle differences in the design features of each project which may have influenced perceptions of personal safety and environmental support, as indicated by the quantitative data, and may explain differences in use between sites. Greater changes in environment perceptions coupled with qualitative evidence of greater 'need' for the Cardiff scheme help to explain its greater relative use. Contextual data also revealed a disconnect between the broad goal of the overall programme (to promote everyday local journeys) and the specific goals of the individual projects, helping to explain the predominance of recreational uses.

Conclusions: A variety of data were integrated to explore the mechanisms and conditions leading to use of new walking and cycling infrastructure allowing for future quantitative research to more formally explore the proposed causal pathways.

07.3.4

From the concrete to the intangible: understanding the diverse experiences and impacts of new transport infrastructure

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

Changes to the environment that support active travel have the potential to increase population physical activity. The Cambridgeshire Guided Busway is an example of such an intervention that provides new traffic-free infrastructure for walking, cycling and public transport. This qualitative investigation explored the mechanisms by which the introduction of the busway did or did not bring about changes in active travel behaviours.

Methods:

Thirty-eight adult participants from the Commuting and Health in Cambridge natural experimental study were purposively selected according to their demographic and travel behaviour change characteristics and invited to participate in semi-structured interviews between February and June 2013. A mixed-method, following-a-thread approach was used to construct two contrasting vignettes (stories) to which the participants were asked to respond as part of the interviews. Inductive qualitative analysis of the interview data was performed with the aid of QSR NVivo8.

Results:

Perceptions of the busway's attributes were important in shaping responses to it. Some participants rarely considered the new transport infrastructure or described it as unappealing because of its inaccessibility or inconvenient routing. Others located more conveniently for access points experienced the new infrastructure as an attractive travel option. Likewise, the guided buses and adjacent path presented ambiguous spaces which were received in different ways, depending on travel preferences. While new features such as on-board internet access or off-road cycling were appreciated, shortcomings such as overcrowded buses or a lack of path lighting were barriers to use. The process of adapting to the environmental change was discussed in terms of planning and trialling new behaviours. The establishment of the busway in commuting patterns appeared to be influenced by whether the anticipated benefits of change were realised.

Conclusions:

We have examined the diverse responses to an environmental intervention that may help to explain small or conflicting aggregate effects in quantitative outcome evaluation studies. Place and space features, including accessibility, convenience, pleasantness and safety relative to the alternative options were important for the acceptance of the busway. Our findings show how environmental change supporting active travel and public transport can encourage behaviour change for some people in certain circumstances.

07.3.5

The potential influence of urban land-use and public transport facilities on active commuting in Wellington, New Zealand: results from the WILUTE model

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Commuter journeys are a major share of the distance travelled by adults, and are a way to build physical activity into the daily routine. Socio-ecological models suggest that one way of promoting active commuting is to make the environment more attractive for commuting. Potential differential effects on people from different socioeconomic groups should be taken into account. The aim of this study was to explore whether a scenario modelled increase of integrated land-use and public transport policies could increase active commuting in the Wellington region, New Zealand. The objectives were: 1) to study socioeconomic differences in active commuting, 2) to study environmental correlates of active commuting, and 3) to model the impact of different urban policy scenarios on active commuting.

Methods: Data from the New Zealand Household Travel Survey were used to assess socioeconomic differences in active commuting. A total of 481 individuals reported on 1806 active commuting trips. Individual data was combined with GIS data on land-use and public transport facilities in both the home area as well as the areas where trips to work started and ended. Logistic regression with repeated measures was used to link environmental factors to likelihood of active commuting. This enabled us to forecast changes in active commuter trips associated with changes in urban design using the Wellington Integrated Land-Use, Transportation and Environment model.

Results: People on low and medium incomes had lower chance of active commuting than people on high incomes. Several land-use and public transport facilities were related to both chance of active commuting and duration of active commuting. Different factors were important when assessing home area versus start and end of the commuter trip area. Changes in paid parking and bus frequency were associated with a predicted increase in active commuter trips.

Conclusions: One way to assess the impact of land-use and transport policies on active commuting is to use a land-use and transport model with specific policy scenarios. Changes in parking price and bus frequency are likely to have a positive impact on active commuting behaviour.

O8.3. ORAL: Eating behavior and weight management

O8.3.1

Social Environment, Eating Regulation, and Intuitive Eating: How Self-Determination Theory Can Help Better Understand the Ability to Eat Intuitively

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Intuitive eating is a positive approach to weight and eating management characterized by a strong reliance on internal physiological hunger and satiety cues rather than emotional and external cues (e.g., Avalos & Tylka, 2006). Past research (Augustus-Horvath & Tylka, 2011) suggests that the quality of one's social environment is likely to have an important influence on intuitive eating.

Objective: Using a Self-Determination Theory framework (Deci & Ryan, 1985, 2002), the main purpose of this research was to examine whether women's perceptions of their mother's and romantic partner's interpersonal styles relate to their reasons for regulating their eating behaviors, and ultimately to their ability to eat intuitively.

Methods: Participants were 278 French-Canadian women (mean age: 29.8 years) currently involved in a romantic relationship. They were recruited through an online advertisement and all measures were completed online. Participants' intuitive eating, eating regulation, and perceptions of their mother's and romantic partner's interpersonal styles were assessed.

Results: Results of structural equation modeling analyses showed that mothers and romantic partners' interpersonal styles are related to women's intuitive eating and motivation for regulating their eating behaviors. More specifically, women who perceived that their mother was controlling with regard to food when they were a child reported more controlled regulation of their eating behaviors, which was negatively related to their intuitive eating. This result was obtained while considering simultaneously current controlling behaviors from the romantic partner, which also made a significant contribution to the prediction of women's controlled regulation. In addition, autonomy support from the partner (but not from the mother) was found to positively predict intuitive eating, and this relationship was mediated by women's more autonomous regulation toward eating. These results were uncovered while controlling for women's body mass index, a confounding factor likely to affect women's eating attitudes and behaviors.

Conclusions: Overall, these results attest to the importance of considering the role of both the mother and the romantic partner for a better understanding of women's eating regulation and ability to eat intuitively.

O8.3.2

Mediators of an Innovative Men-Only Weight Loss Program

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Objective: To test the mediators (autonomous motivation, self-regulation, self-efficacy, and outcome expectancies) of a weight loss program for men on weight loss after 6 months.

Methods: Study data are from a 6-month randomized controlled trial testing the efficacy of the REFIT (Rethinking Eating and FITness) program, a novel male-targeted, primarily internet-delivered weight loss program, as compared to a waitlist control group. The sample included 107 overweight and obese men (age 44.2±11.4 years, BMI 31.4±3.9 kg/m², 90.6% retention at 6 months). The program targeted increasing autonomous motivation, positive outcome expectancies, and self-efficacy for weight loss behaviors through weekly online, tailored feedback and participant selected lessons. Simple self-regulation strategies, including daily self-weighing coupled with tracking multiple 100-calorie changes to diet were promoted. Weight was objectively measured and mediators were measured using established questionnaires. Changes in the hypothesized mediators between baseline and 3 months were tested as simple mediators of the intervention effect on weight loss at 6 months followed by a multiple mediation analysis. Confidence intervals for indirect effects were developed using 1000 bootstrapped samples.

Results: Participants in the intervention group lost more weight than those in the control group (-5.6±6.5 kg vs. -0.6±3.3, p <0.001). The intervention effect was mediated by change in autonomous motivation for diet (indirect effect=-0.70, 95% CI=-1.43, -0.25), autonomous motivation for exercise (-0.32; CI=-0.10, -0.03), and autonomous motivation for participation in a weight loss program (-0.74; CI=-1.74, -0.18); self-efficacy for diet (-1.05; CI=-2.01, -0.42); and self-regulation through self-weighing (-4.10, CI=-6.52, -2.33). Other mediators including self-efficacy for exercise and outcome expectancies were not significant. In the multiple mediation analysis, all mediators remained significant except motivation for exercise and self-weighing was the strongest mediator of the treatment effect.

Conclusions: This study suggests that self-weighing, self-efficacy for diet, and autonomous motivation for diet are important intervention targets for weight loss programs for men. These findings contribute to the emerging research on intervention targets for men in weight loss programs.

O8.3.3

Marital Stress and Food Intake: An Examination of the Moderating Role of BMI and Restraint

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Although studies on stress and food intake have demonstrated the disinhibiting effect of ego-threatening stressors on food intake among restrained eaters and overweight individuals, relational stressors that are ego-threatening seemed to have an even more disinhibiting effect on food intake. Therefore, the aim of the present study was to investigate the impact of a stressful marital discussion that were ego-threatening on food intake in both spouses, while taking into account the possible effect of BMI and restraint on this relationship.

Methods:

Eighty heterosexual couples from the Laval University community replied to an ad distributed via email. In a laboratory setting, the couples discussed for 15 minutes an aspect that they want their partner to change, after what they completed what was presented to them as a taste test (used to assess food intake). The following variables were also assessed: mood states, height and weight (BMI), as well as restraint levels (Restraint Scale). Using PROCESS macro developed by Hayes, three-way interactions between mood change, BMI, and restraint were tested with multiple regression analyses among both men and women, adjusting for hunger as a covariate.

Results:

Among women, the multiple linear regression model was significant and accounted for 28% of variance, $F(8, 70)=3.46$, $p=.002$. The three-way interaction was significant ($p=.039$); that is the impact of mood change on food intake was moderated by BMI and restraint. More specifically, restrained women with high BMI ate more when their mood worsened ($CE=.3235$, $p=.054$), as opposed to unrestrained women with high or average BMI who ate significantly less when their mood worsened ($CE=-.3478$, $p=.037$; $CE=-.7690$, $p=.036$). Among men, although the overall model was significant, $F(8, 70)=3.99$, $p=.001$, only hunger as a covariate was a significant predictor of food intake ($p<.001$).

Conclusions:

These results suggest that the impact of marital stress on food intake is different among men and women, and is greater among women with a high BMI. They also highlight the complex nature of the relationship between stress and food intake and put forward the importance to address restrained eating and BMI when studying stress-induced eating.

O8.3.4

The less you eat, the more you move? Paradoxical findings on non supervised physical activity with slow versus fast weight loss: The TEMPO Diet Trial

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

Physical activity is an important aspect of successful weight management. However, adherence to physical activity guidelines under normal living conditions is poor. Very low energy diets (VLEDs), using meal replacements, are an option for weight management. VLEDs restrict energy intake to $<3.3\text{MJ}$ (800kcal) per day and as a consequence of severe energy restriction, may result in a decrease or no change in physical activity. The aim of this study was to investigate whether physical activity differs in response to either fast (severe energy restriction) or slow (moderate energy restriction) weight loss.

Methods:

This preliminary analysis includes 14 obese (BMI 30-40kg/m²), postmenopausal women participating in the TEMPO Diet Trial. Subjects were randomised to either fast (VLED, 70% energy restriction, $n=7$) or slow (30% energy restriction, $n=7$) weight loss intervention. Participants were provided with a pedometer and were advised to gradually increase step count to 8-10K steps per day. Time spent in different levels of activity (sedentary, total, light, moderate, vigorous) was measured using a tri-axial accelerometer (SenseWear®) for 7-days at baseline and 1, 4 and 16-weeks after commencing the intervention. Analysis was conducted with STATA using linear mixed models for repeated measures.

Results:

After 16-weeks, the slow weight loss group lost $6.0 \pm 2.1\text{kg}$ compared with $16.9 \pm 2.7\text{kg}$ in the fast weight loss group. There were no significant changes in time spent in any of the activity types in the slow weight loss group. Conversely, those in the fast weight loss group increased their total and light activity significantly from $167 \pm 35\text{ min/day}$ and $136 \pm 27\text{ min/day}$ at baseline to $342 \pm 35\text{ min/day}$ and $278 \pm 27\text{ min/day}$ at 16-weeks.

Conclusions:

Despite severe restriction of energy intake, this preliminary analysis suggests that fast weight loss is associated with a paradoxical increase in physical activity. Possible mechanisms may include increased motivation and capability secondary to loss of weight, or it may be related to physiological adaptations to fast weight loss, such as ketosis. Fast weight loss may provide the 'kick start' obese individuals' need to increase their activity and manage their weight, without the need for intensive or supervised exercise interventions.

08.3.5

Effects of a Health-at-Every-Size Program on Intuitive Eating and Diet Quality in Women

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Health-At-Every-Size (HAES) interventions focus on healthy lifestyle by promoting overall benefits of behavior changes related to diet and physical activity, with an emphasis on body acceptance and intuitive eating. The purpose of this study was to investigate the effects of a HAES program on intuitive eating and diet quality in women.

Methods: The HAES program was conducted in small groups (13 3-hour weekly meetings and a 6-hour intensive day), and was offered by professionals from Health and Social Services Centers in Québec (Canada). In the present study, 207 women who took part in the HAES program (body mass index (BMI): $35.8 \pm 6.8 \text{ kg/m}^2$, age: $50.9 \pm 11.4 \text{ y}$) were compared to 103 women from a control group (waiting list) (BMI: $34.6 \pm 7.4 \text{ kg/m}^2$, age: $49.1 \pm 12.9 \text{ y}$). The intuitive eating score (IES) was assessed using the Intuitive Eating Scale and diet quality was evaluated with a web-based self-administered food frequency questionnaire. Measurements were performed at baseline (T=0), post-intervention (T=4 months) and at one-year follow-up (T=16 months).

Results: Women from the HAES group showed greater increases in IES than women from the control group in response to the intervention and at follow-up ($p=0.0008$). Different changes in the diet were observed in the two groups. In women from the HAES group, the consumption of *junk* food (i.e. sweet, savoury and soft drinks) decreased at T=4 and T=16 whereas it remained stable in the control group ($p=0.0112$). While the consumption of fruits and vegetables (F&V) remained stable in women from the HAES group ($p=0.0039$), it decreased at T=4 and T=16 in women from the control group. The mean daily caloric intake decreased at T=4 for both groups ($p<0.001$) but the changes were not different between the two groups ($p=0.57$). Changes in IES were not significantly correlated with changes in F&V, *junk* food or caloric intake in either group.

Conclusions: The HAES program seems effective in helping women eat more intuitively and also favours modest improvements in diet quality. However, changes in diet quality do not appear to be explained by the increase in intuitive eating in response to the intervention.

09.3. ORAL:

Nutrition in schools and children

09.3.1

Teaching approaches and strategies that promote healthy eating in primary school children - A systematic review and meta-analysis

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Background:

Healthy eating by primary school-aged children is important for good health and development. Schools can play an important role in the education and promotion of healthy eating among children. The aim of this review was to: 1) perform a systematic review of randomised controlled, quasi-experimental and cluster controlled trials examining the school-based teaching interventions that improve the eating habits of primary school children; and 2) perform a meta-analysis to determine the effect of those interventions.

Methods:

The systematic review was limited to four healthy eating outcomes: reduced food consumption or energy intake; increased fruit and vegetable consumption or preference; reduced sugar consumption or preference (not from whole fruit); increased nutritional knowledge. In March, 2014 we searched seven electronic databases using predefined keywords for intervention studies that were conducted in primary schools which focused on the four healthy eating outcomes. Targeted internet searching using Google Scholar was also used. In excess of 200,000 possible citations were identified. Abstracts and full text of articles of potentially relevant papers were screened to determine eligibility. Data pertaining to teaching strategies that had an effect on healthy eating outcomes for primary school children was extracted from the 49 eligible papers.

Results:

Experiential learning strategies were associated with the largest effects across the reduced food consumption or energy intake; increased fruit and vegetable consumption or preference; and increased nutritional knowledge outcomes. Reducing sugar consumption and preference was most influenced by cross-curricular approaches embedded in the interventions.

Conclusions:

As with most educational interventions, most of the teaching strategies extracted from the intervention studies led to positive changes in primary school children's healthy eating behaviours. However, given the finite resources, increasing overcrowding of school curriculum and capacity of teachers in primary schools, a meta-analysis of this scope is able to provide stakeholders with the best evidence of where these resources should be focused.

O9.3.2

Development of a Food and Nutrition Curriculum Framework for cross-curriculum use in Australian schools

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SIG: Yes, Early care and education

Awards: No

Objective: The primary purpose of this project was to develop a Kindergarten to Year 10 Food and Nutrition Curriculum Framework to integrate teaching of food, nutrition and healthy eating in a range of learning areas in the new Australian Curriculum for schools. Project objectives focused on identifying key food and nutrition education themes, messages and content needed to develop appropriate awareness, knowledge, understanding, application and critical analysis as children progress from kindergarten to year 10.

Methods: A literature review was undertaken to inform development of a draft scope and sequence of key content. This drew on existing international food and nutrition curriculum frameworks, evidence surrounding best practice pedagogy, theories of development of children's learning and eating habits and 2013 revisions to Australian Dietary Guidelines. A two-round Delphi process and workshop was conducted with 29 Australian nutrition education experts to refine and validate the draft. Outcome measures were consensus on developmental stages, food and nutrition focus areas, and messages and content descriptions for each focus area and developmental stage. Consensus meant over 80% of experts rated items as 'critically important' or 'very important' to develop awareness, knowledge, understanding, application and critical analysis in the specific age band.

Results: Four food and drink focus areas (source, choice, experience and health) and five developmental stages based on 2-year school year levels were defined and used to scaffold content. Two to four food and nutrition content descriptions and 1-2 key messages for each focus area at each developmental stage were agreed along with examples of how these can be applied in different learning areas.

Conclusions: Results show how food and nutrition content can be scaffolded to build nutrition literacy as children progress through schooling. This framework has been used to guide development of Refresh.ED, a suite of online kindergarten to year 10 teaching and learning materials which integrates comprehensive food and nutrition education content. The framework has been applied in an Australian Curriculum context yet its foundation in child development, nutrition education and pedagogy theory provides potential for its application in a diversity of other settings and cultural contexts; to promote nutrition literacy worldwide.

O9.3.3

School meals, dietary quality and weight status

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: The majority of UK children consume a packed lunch from home or have a meal provided by the school at lunch-time. Recent research suggests that packed lunches (PL) are of poorer quality than school-provided meals (SPM), however it is unknown if this influences overall dietary intake or is related to weight status. This study aims to explore food and nutrient intake from PL and SPM and their association with overall diet quality and weight status.

Methods: Dietary intake during school-time (observed by researchers) and outside of school-time (reported by parents) was measured using a 24 hour food-tick-list among 1170 children aged 5-6 years across 54 UK primary schools participating in the WAVES childhood obesity prevention trial. Overall diet quality was determined using an adaptation of the Diet Quality Index (DQI). Body Mass Index standard deviation scores (zBMI) were calculated from height and weight data taken by trained researchers, using UK1990 growth reference data. Random-effects multivariate logistic regression was performed to assess the differences between PL and SPM in this cross-sectional analysis.

Results: In preliminary analyses, lunch provided 30% of the daily energy intake for PL and SPM. However, there were significant differences in nutrient intake. PL children consumed significantly more carbohydrate ($p < 0.001$) but less fat, saturated fat, protein, and fibre ($p \leq 0.001$) than SPM children. However, over the 24-hour period, these differences were only maintained for protein ($p = 0.005$), carbohydrate ($p = 0.017$) and fibre intake ($p < 0.001$). At lunch, PL children ate significantly less fruit and vegetables (0.98 portions vs. 1.59 portions, $p < 0.001$) and were more likely to consume processed meats (38% vs 14%, $p < 0.001$), savoury snacks such as crisps (45% vs 6%, $p < 0.001$), and dairy products (63% vs 28%, $p < 0.001$). Over 24-hours, DQI scores showed a higher quality of diet overall in the PL children (OR 1.10 (1.03, 1.18) $p = 0.004$) but no association with zBMI (OR 0.92 (0.82, 1.02) $p = 0.109$) after adjustment for confounders (sex, deprivation, ethnicity).

Conclusions: PL children generally consumed a lower quality lunch than SPM children. However, this did not translate into an overall lower quality diet. Additionally, there was no association between lunch type and BMI z-score.

09.3.4

Review and application of best practice pedagogy in development of *Refresh.ED* nutrition education resources for teachers

Margaret Miller, Samantha Baker, Amanda Devine
Edith Cowan University, Perth, WA, Australia

SIG: Yes, Early care and education

Awards: No

Objective: Pedagogy, the art and science of teaching children is rarely explicit in development of nutrition teaching resources. The primary purpose of this research was to identify and apply best practice pedagogy in the development of food and nutrition resources for teaching kindergarten to year10 Australian Curriculum. Research objectives were to; identify and review pedagogical theories and frameworks applicable to nutrition resource development across this age range, and to create and test a pedagogy checklist for use in development of nutrition teaching resources.

Methods: A search of academic literature from 1995 was undertaken using Edith Cowan University's Library One Search of health, science, psychology and education databases with combinations of keywords pedagogy, school, education, nutrition, theory, framework, model and checklist. Grey literature was searched using Google. Core components of identified pedagogical frameworks, models and theories were mapped to compile a pedagogy checklist. This was applied to development of nutrition teaching resources for different age groups in the *Refresh.ED* program and tested in six workshops with 70 experienced and 180 pre-service home economics and health teachers. Teachers used standard definitions to identify presence or absence of elements in five learning tasks.

Results: Five dominant pedagogy frameworks suitable across the age range were identified, but none specific to teaching nutrition. Mapping identified the NSW Model of Pedagogy (2003) as inclusive of most components of generic frameworks. This featured three dimensions; Quality Learning Environment, Intellectual Quality; and Significance and five or six elements per dimension; all adopted in the checklist. Application of the checklist by teachers in group review of *Refresh.ED* resources found that all elements of Intellectual Quality and Significance could be demonstrated. However some elements of Quality Learning Environment relied mainly on the classroom skills of teachers and their ability to build relationships with students.

Conclusions: This study shows how an evidence-based checklist can be used to ensure pedagogical quality in development of school food and nutrition teaching resources. Results also highlight the importance of individual teaching and relationship skills in creation of Quality Learning Environments, a dimension of pedagogy which needs priority in professional development of nutrition educators.

09.3.5

Do changes in school eating behaviour policies or programs impact student fruit and vegetable consumption?

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SIG: Yes, Policies and environments

Awards: No

Objective: While there are many school-based interventions designed to increase fruit and vegetable (F&V) consumption among youth, most of them appear to have limited to no impact. Despite the lack of evidence of what works, school stakeholders are continually developing and implementing new school-based programs designed to promote healthy eating among students. The objective of this natural experiment is to examine if changes in school-based eating behaviour programs between Year 1 (Y1) and Year 2 (Y2) of the COMPASS study had any impact on students meeting the Canada Food Guide recommendations for F&V intake.

Methods: This quasi-experimental study used data from over 23,000 grade 9 to 12 students attending 43 Ontario secondary schools to examine the difference-in-difference changes in F&V consumption among the schools that implemented a new school-based eating behaviour program between Y1 and Y2 of the COMPASS study (www.compass.uwaterloo.ca).

Results: In Y1, 5.0% (n=1,205) of the sample reported meeting the Canada Food Guide F&V recommendations, and in Y2, 5.4% (n=1,255) of the sample reported meeting the Canada Food Guide F&V recommendation. In total, 12 different schools implemented a new eating behaviour program between Y1 and Y2. Overall, 4 of the school programs had no impact on the school-level prevalence of students meeting the Canada Food Guide F&V recommendations. Conversely, 9 schools implemented programs that had a significant impact on the school-level prevalence of students meeting the Canada Food Guide F&V recommendations. Of those 9 schools, 5 schools implemented an eating behaviour program that had a positive impact on the prevalence of students meeting the Canada Food Guide F&V recommendations between Y1 and Y2 that was larger than the change observed in the control schools, and 4 schools implemented an eating behaviour program that appears to have had a negative impact on the prevalence of students meeting the Canada Food Guide F&V recommendations between Y1 and Y2.

Conclusions: School-based programs that focus on using a whole school approach to promoting health eating among students appear effective for increasing F&V consumption among grade 9 to 12 students. Some other school programs appear to have promise within particular school contexts (e.g., providing healthier options in the cafeteria), whereas others appear to have no impact (e.g., field trips to grocery stores).

O1.4. ORAL: Physical activity and sedentary behavior in children

O1.4.1

Testing the feasibility of Virtual Field Trips as physically active lessons for children

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

Children spend a large amount of their time in obligatory seated school lessons, with notable effects on health and cognitive outcomes. Emerging research is attempting to convert educational time from sedentary to active via physically active lessons. Virtual Field Trips (VFTs) are proposed by the authors as a potential new format of physically active lesson. These integrate educational, globe-based content on interactive whiteboards with related physical movements. This research aimed to test the feasibility of Virtual Field Trips as physically active lessons within primary-school settings.

Methods:

85 English pupils (9-10 years, 58.8% male) were randomly assigned to either a 30-minute physically active London 2012 Olympics-themed VFT, or a 30-minute sedentary version of the same VFT. Physical activity was measured using GT1M Actigraphs with Pulsford cut-points and user evaluations were gained from teacher and pupil questionnaires.

Results:

Pupils in the active VFT displayed significantly less sedentary time ($p<0.001$), and significantly more light ($p<0.001$), moderate ($p=0.002$) and vigorous physical activity ($p=0.001$) than sedentary VFT pupils. High acceptability was found in teachers and active VFT students rated their session significantly higher than sedentary pupils ($p<0.002$).

Conclusions:

VFTs are feasible physically active lessons. Future longitudinal research is needed to assess the prolonged effects of active VFTs on physical activity and educational outcomes.

O1.4.2

Exercise is effective in reducing depression in youth with major depressive disorder: the Healthy Body Healthy Mind randomised controlled trial

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: To investigate the effectiveness of a 12-week supervised exercise training program incorporating brief motivational interviewing to treat major depressive disorder (MDD) in youth.

Methods: 79 participants (youth aged 15-25 years; mean \pm SD age 20.8 ± 2.6 years) with MDD were screened (telephone then professional psychological diagnosis); 53 (42 females) were eligible to participate (MDD from SCID, no psychotic illness, not pregnant, no physical barriers to exercise, not suicidal, no major eating disorder) and were randomized (Wait-list Control N=27, Intervention N=26). Participants completed assessments at baseline and after 12 weeks, which included questionnaires: the Beck Depression Inventory (BDI-II), Beck Anxiety Inventory (BAI); and fitness measures: $\dot{V}O_{2max}$, YMCA bench press test, and seated horizontal leg press endurance test. Participants engaged in a motivational interview with their trainer prior to commencing the exercise program, which consisted of small group trainer-led supervised exercise (resistance and endurance) training 3 times a week (1h per session) for 12 weeks, and encouragement to do at least 30min of physical activity on other days. ANOVA was used to determine intervention effects using both intention-to-treat (ITT) and completers' analyses.

Results [ITT]: At baseline, all participants met criteria for MDD; after 12 weeks 73% of intervention and 96% of control groups met the criteria. Depressive symptoms decreased significantly (ITT, $p=0.045$) from 32.8 ± 10.3 to 25.2 ± 13.8 in the intervention group; no difference was observed in controls (34.2 ± 10.7 to 31.9 ± 10.1). Anxiety symptom changes did not differ significantly (ITT, $p=0.49$) between groups (intervention 20.1 ± 10.3 to 15.9 ± 9.5 ; controls 23.5 ± 13.1 to 20.9 ± 12.6). There was no significant improvement (ITT) in $\dot{V}O_{2max}$ for either group but the number of YMCA bench press repetitions increased in the intervention group only. Intervention group attendance averaged $39.3 \pm 26.5\%$ of scheduled exercise sessions. Completers' analysis found much larger reductions in depressive (31.8 ± 11.6 to 13.8 ± 10.0) and anxiety symptoms (20.3 ± 11.2 to 10.3 ± 5.3) in the intervention group.

Conclusions: Exercise training is a feasible and potentially effective intervention for MDD in youth. The challenge is engagement and maintaining motivation, which are highly variable.

O1.4.3

Findings from the EASY Minds cluster randomized controlled trial: evaluation of a physical activity integration program for mathematics in primary schools

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Objective: The aim of this study was to evaluate the impact of a primary school-based physical activity integration program delivered by trained classroom teachers on objectively measured physical activity across both the school day and a range of educational outcomes.

Methods: Ten classes (n=240, 59.1% male, mean age 11.1 SD .7) from eight public schools in New South Wales, Australia were recruited and randomly allocated to intervention (the EASY Minds [Encouraging Activity to stimulate Young Minds] program) or control conditions. Classroom teachers from the intervention group received one day of professional learning and were taught to embed movement-based learning in their students' (n=142) daily mathematics program for at least three lessons per day over a six day period. Online support was provided via weekly email and observations were carried out in weeks 1, 3 and 5 of the program. Students in the control group (n=98) continued with their regular mathematics program. The primary outcome was accelerometer-determined activity (CPM) across the school day. Children's CPM during the mathematics lesson, moderate-to-vigorous physical activity (school day and mathematics lesson), sedentary time (school day and mathematics lesson), on-task behaviour, enjoyment of mathematics and mathematics attainment were assessed as secondary outcomes. Linear mixed models, following the intention-to-treat principle were used to analyze the impact of the program.

Results: Significant intervention effects were found for CPM across the whole school day (adjusted mean difference 103.1 CPM, 95% CI 36.5, 169.7, p = 0.008). For secondary outcomes, intervention effects were found for CPM across mathematics lessons (168.7 CPM, 95% CI 90.1, 247.4, p=0.008) and reduced sedentary time (-3.5%, 95% CI -7.0, -0.13, p= 0.044) across the school day and during mathematics (-8.2%, CI -13.0-2.0, p=0.010). There was an increase in MVPA across the schools' mathematics period (2.6%, 95% CI, 0.9, 4.4, p=.009). Intervention effect were also found for on task behaviour (13.8%, 95% CI, 4.0, 23.6, p = 0.011), but not for mathematics performance or mathematics attitude.

Conclusion: The EASY Minds program demonstrated that integrating movement across the primary mathematics syllabus is feasible and efficacious for enhancing school-based PA and improving on-task behaviour in mathematics lessons.

O1.4.4

Smartphone apps to improve fitness and increase physical activity among young people: The AIMFIT mHealth RCT

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Objective: Worldwide, 80.3% of adolescents aged 13-15 years do not reach current physical activity (PA) recommendations and are at risk of preventable non-communicable diseases. There is an age-related decline in PA in young people, which tracks into adulthood. Common technologies, such as smartphones and apps, may enhance the appeal of interventions to increase levels of PA among this population. The AIMFIT trial investigated the effects of a mHealth delivered PA intervention to improve fitness compared with usual behaviour in young people not meeting the PA recommendations.

Methods: A three-arm, parallel, randomised controlled trial was conducted in 2013-14 in Auckland, New Zealand. Fifty-one eligible participants aged 14-17 years were randomised to one of three conditions: 1) use of an immersive smartphone app (n = 17), 2) non-immersive app (n = 16), or 3) usual behaviour (control n = 18). The apps consisted of an eight-week training program designed to improve fitness and ability to run 5 km. Data were collected at baseline and 8 weeks. The primary outcome was cardiorespiratory fitness, assessed as time to complete the one mile run/walk test at 8 weeks. Secondary outcomes were PA levels (PAQ-A and accelerometry), self-efficacy (PASES), enjoyment (PACES), psychological need satisfaction (PNSES) and acceptability and usability of the apps.

Results: Participants were on average 15.7 years old (14-17 years), mostly NZ Europeans (61%) or Pacific Islanders (22%) and females (57%). Preliminary findings indicate group assignment did not have a significant effect on fitness. Compared to the control, mean (\pm SE) baseline fitness test-, sex-, and multiple comparisons-adjusted fitness test changes were -28.4 \pm 15.4 and -24.7 \pm 15.7 seconds for the immersive and non-immersive app groups, respectively. Most participants (32%) used the app 2 times/week, 25% only used it 1 time/week and 9% none. 81% were interested in trying different apps in the future.

Conclusions: While our pragmatic approach using commercially available apps as a stand-alone instrument to improve fitness did not show significant effects, interest in future use of PA apps is promising and suggests a potential role of such instruments in a multifaceted approach to promote PA.

O1.4.5

Children's satisfaction with intervention mediates the difference in effect between boys and girls on screen time

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective:

The high prevalence of sedentary time in childhood has led to the development of intervention studies targeting screen time. However, only a limited number of published intervention studies have reported on process evaluation, including data on exposure and satisfaction. Moreover, evaluation by target groups is needed in order to examine for whom and why they work.

Therefore, the purpose of the study was to (i) compare the effects of the UP4FUN intervention on screen time and breaks in sedentary time by gender and socioeconomic status (SES), (ii) investigate if any differences in effects in these subgroups were mediated by children's and parents' exposure and/or satisfaction with the intervention.

Methods:

The aim of the UP4FUN intervention was to reduce and break up sitting time at home and in school among 10-12 year olds in Europe. The intervention included a six-week school-based family-focused intervention, and was tested in 62 schools using a pre-test post-test design including an intervention and control condition in Belgium, Germany, Greece, Hungary and Norway. The intervention was framed in a social ecological perspective, applying the taxonomy of behavior change techniques. Multilevel linear regression analyses were conducted on data from self-reported questionnaires filled in by children and parents. The product-of-coefficient test of MacKinnon was used to assess mediating effects.

Results:

In the intervention condition, girls decreased screen time from pre to post while screen time in boys did not change. Middle to high SES children had a larger decrease in screen time compared to low SES children. No differences in effect were found on the number of breaks. No difference in exposure and satisfaction was found according to SES. However, girls liked the UP4FUN intervention significantly more and indicated being more exposed to it than boys. More satisfaction and exposure was significantly related to less screen time and more breaks. Children's satisfaction showed a significant mediating effect on the difference in effect between boys and girls on screen time.

Conclusion:

Creating interventions which ensure that children engage in them is important. More pretesting and process evaluations of programs aiming to reduce and break up sitting time are needed.

O1.4.6

Changing school environments in early adolescence increases sedentary behaviour leisure screen time

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: Social-ecological theory highlights the connection between environments and health, yet there is no empirical evidence of the impact of changing school environments on sedentary behaviour. The study purpose was to examine the effect of a change of school environment on sedentary behaviour in adolescents.

Methods: Fifteen schools in Victoria, Australia were recruited from the bottom two strata of a five level socio-economic scale. In nine schools students in Year 6 primary school transitioned to a different school for Year 7 secondary school, while in six schools, students remained in the same school environment from Year 6 to Year 7. Time1 (T1) measures were collected from students ($N=245$) in Year 6 (age 11-13). T2 data were collected from 243 (99%) of the original student cohort when in Year 7. Daily average sedentary time data were collected objectively via Actigraph accelerometer. Self-report screen time was collected via questionnaire. School environment data were collected via school staff survey. Change in sedentary time and screen behaviour were conducted longitudinally i) for all students and ii) by change/no change of school. Mixed model regression analysis tested for behavioural interaction effects of changing/not changing school.

Results: Across all students we observed increases in sedentary behaviour (16 min; $P<0.05$) and weekday leisure screen time (17 min; $P<0.05$). The number of students using computers for leisure increased (20%; $P<0.05$), whilst the number watching television decreased (13%; $P<0.05$). Sixty-three percent ($N=152$) changed schools from T1 to T2. School staff surveys identified secondary schools with more electronic device policies than primary schools ($P<0.05$). Students who changed school reported an average increase in weekday (32 mins) and weekend (65 mins) leisure screen time, compared to a reduction in weekday (9 mins) and weekend (25 mins) leisure screen time by students who did not change school environments (all $P<0.05$).

Conclusions: Transitioning from Year 6 to Year 7 generally impacts negatively on screen behaviour, with a greater negative effect in adolescents who change school environments. Understanding what policy and environment contexts drive this negative change across the school transition appears critical to prevent further leisure screen time increases in later adolescence.

SO1.1 SHORT-ORAL: Physical Activity, Youth, Interventions

SO1.1.1

Evaluation of the Y-PATH intervention: results of a cluster randomised controlled trial

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The role of physical activity in the health and well-being of young people is well established. Y-PATH (Youth-Physical Activity Towards Health) is a whole of school physical activity intervention, underpinned by self-determination theory and the social-ecological model. It aims to increase adolescent physical activity levels through targeting self-efficacy, attitudes towards physical activity, knowledge of the health benefits of physical activity and fundamental movement skill proficiency.

Methods: A cluster randomised controlled trial was carried out in 20 mixed gender schools to evaluate the effect of the Y-PATH intervention ($n=534$, mean age 12.69 ± 1.16 years at baseline, 49.7% male). Data on physical activity level (accelerometry), fundamental movement skill proficiency, a range of psychological factors, BMI, and cardiovascular fitness were collected at three time points: pre-intervention (September 2013), post intervention (April 2014), and retention (September 2014).

Results: A series of one-way repeated measures ANOVA's were used to determine change over time. Physical activity results showed a significant interaction effect between intervention and time ($p = 0.025$), with children in the intervention school recording an increase (10%) in minutes of MVPA over the period of the intervention, while children in the control school recorded a decrease over the same period. Fundamental movement skill proficiency results also showed a significant interaction effect between intervention and time ($p = 0.000$), with both control and intervention groups showing an increase in fundamental movement skill proficiency over time, but a significantly greater increase occurring with the intervention condition (17%). Results also indicate that while physical activity behavioral intentions of children in the intervention schools remained stable over time, a significant interaction observed between intervention and time ($p = 0.036$) was a result of an 8% decrease in behavioral intention observed over the same period in the control schools.

Conclusions: Increasingly studies are reporting the positive effect school-based PE interventions have on PA participation (McKenzie et al., 2004; Ward et al., 2006; Payne & Morrow, 2009). Results support the efficacy of the whole-school Y-PATH intervention and provide rationale to move towards national/international dissemination. Future research should also further evaluate the impact of Y-PATH in single gender school settings.

SO1.1.2

Longitudinal effects of the Empowering Coaching™ programme on the observed coach behaviours in grassroots football across four European countries.

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Drawing from an integrated AGT and SDT perspective (Duda, 2013), we used the newly developed Multidimensional Motivational Climate Observational System (MMCOS; Smith et al, in press) to objectively assess the effects of a coach education program (i.e., Empowering Coaching™) implemented as part of the European-wide "Promoting Adolescent Physical Activity" aimed at optimizing the experiences of young people taking part in sport.

Methods: Seventy-five grassroots football coaches from the UK ($n = 18$), France ($n = 17$), Spain ($n = 18$), and Greece ($n = 22$) were recruited from the larger EU-based PAPA project. Coaches were filmed during a training session at baseline (September), one month after the intervention (November) and at the end of the season (June). The video files were analyzed according to MMCOS' 'empowering' (i.e., autonomy supportive, task-involving, relatedness supportive, structured) and 'disempowering' (i.e., controlling, ego-involving, relatedness thwarting) dimensions. Two raters coded the footage taking into consideration the motivation-related potency (i.e., the frequency, intensity, pervasiveness) of the observed coaching environment. At the end of the session, raters provided an overall rating of the degree to which the coaching atmosphere was empowering or disempowering. The intervention was delivered in October and consisted of 2 3-hour coach education seminars aimed at working with coaches so that they have the understanding of and have identified strategies to foster more empowering (i.e., autonomy-supportive, task-involving, relatedness-supportive) sport environments and recognize disempowering behaviours. Due to the nested nature of our longitudinal data, we used multilevel modeling to examine the effects of the Empowering Coaching™ program.

Results: Multilevel modeling results revealed that, compared to the control group, coaches assigned to the intervention group created a significantly less disempowering environment ($\gamma = .26$, $SE = .09$, $p < .001$) and less ego-involving atmosphere ($\gamma = .21$, $SE = .08$, $p < .001$). The two groups of coaches did not differ on other dimensions.

Conclusions: Results revealed that coaches who participated in the Empowering Coaching™ program significantly decreased the potency of the ego-involving environment dimension and overall created a less disempowering motivational environment over the course of the season. Initial evidence is provided regarding the effectiveness of the evidence-based Empowering Coaching™ intervention program, and results are discussed in relation to implications for young athletes' sporting experiences.

SO1.1.3

Impact of 'Bikeability', a national cycle training scheme for children in England

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SIG: No, this does not fit in any of the special interest groups

Awards: Yes, for the Early Career Award

Objective: The centrally-funded cycle training scheme 'Bikeability' is a flagship policy of the current government in England. 'Bikeability' is targeted at 9-11 year olds and its stated aims include giving children the confidence to cycle more. There is, however, little evidence on the scheme's effectiveness in achieving this. We therefore examined whether delivering Bikeability is associated with 1) cycling frequency, or 2) independent cycling.

Methods: We used operational delivery data to identify all schools in England (outside London) that offered Bikeability in 2011-2012. We merged this with information on children (aged 10-11) participating in the nationally-representative Millennium Cohort Study. We used a natural experimental design to capitalise on the fact that Millennium Cohort participants were surveyed at different times during 2012 and were also offered Bikeability at different times during 2012. This allowed us to compare cycling levels between children whose schools delivered Bikeability before their survey interview ('intervention group', N=2563) with an otherwise comparable group of children whose schools delivered Bikeability later in the academic year ('control group', N=773). Parents reported whether their child had completed any cycle training; their child's cycling frequency; whether their child ever made local cycling trips without an adult; and other child and family factors.

Results: Children whose school had offered Bikeability were much more likely to have completed cycle training than the control group (68% vs. 28%, $p < 0.001$). There was, however, no evidence that delivering Bikeability in school was associated with a higher frequency of cycling (49.0% cycling at least once per week in the intervention group vs. 49.6% in the control group; adjusted risk ratio 0.99, 95% CI 0.89, 1.10). There was likewise no evidence of an association with cycling independently (51.5% in the intervention group vs. 50.1% in the control group; adjusted risk ratio 0.97, 95% CI 0.88, 1.06).

Conclusions: Offering high-quality cycle training free at the point of delivery in English schools encourages children to do cycle training, but we found no evidence of short-term effects on cycling frequency or independent cycling. Future evaluation should investigate longer-term effects on these and other stated Bikeability objectives such as increasing cycling safety.

SO1.1.4

Short-term impact of the WIXX multimedia communication campaign on children's physical activity beliefs and behaviours

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose. Increasing participation in physical activity (PA) among children and youth is an important public health priority. The aim of this study was to examine the impact of the WIXX campaign on children's PA beliefs and behaviours during the first year of campaign implementation.

Methods. This study adopted a repeated pretest post-test design. Two cross-sectional population-based telephone surveys were conducted before (in May-June of 2012: T₀) and nine months after (May-June of 2013: T₁) the launch of the campaign in September 2012 in the Province of Québec, Canada. A random digit-dialing procedure was used to recruit 1000 (T₀) and 1001 (T₁) families with a child aged 9 to 13 years. The first year core components of the WIXX campaign included paid advertisements, community-based activities and the development of local partnerships. Also, three separate websites were developed to reach children, their parents, and practitioners. The impact of WIXX on seven attitudinal and self-efficacy beliefs and two PA behaviours (i.e., trying new physical activities, meeting recommendations) was examined as a function of recall of WIXX ads (unaided, aided, and no recall [reference category]). Recall, beliefs, and behaviours were self-reported by the children. Analyses were stratified by sex and controlled for screen time, parental socio-demographic characteristics, socioeconomic status, weight, school grades, and PA levels when appropriate.

Results. Fully-adjusted logistic regression models showed that girls reporting unaided recall of WIXX ads were more likely to hold strong beliefs that there were many places to be active in their neighbourhood (OR=2.1; 95%CI: 1.0, 4.4). Boys having unaided (OR=2.9; 95%CI: 1.1, 7.3) and aided (OR=1.6; 95%CI: 1.0, 2.4) recall of WIXX were more likely to hold strong beliefs that PA would help them spend more time with their friends. Also, boys having aided recall were more likely to report having tried new physical activities (OR=2.1; 95%CI: 1.3, 3.2). No other significant effects were observed.

Conclusions. Exposure to the WIXX campaign was associated with favourable PA beliefs thus paving the way to eliciting future changes in PA.

The WIXX campaign and population-based surveys are financially supported by the Québec en forme.

SO2.1 SHORT-ORAL: Food and nutrition environment

SO2.1.1

Statistical approaches used to assess the equity of access to food outlets: a systematic review

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

Poor dietary quality, found to be higher amongst those residing in areas of lower socioeconomic position (SEP), is one of the contributors to the obesity epidemic. In recent years, many studies have considered the distribution of food outlets, such as supermarkets and fast food outlets, by neighbourhood-level SEP to identify whether residents in low SEP neighbourhoods have less access to outlets providing healthy food choices and increased access to those offering energy-dense foods. These studies involve spatial data meaning traditional statistical techniques, such as regression, may not be appropriate due to the presence of spatial autocorrelation. Ignoring spatial autocorrelation can lead to imprecise standard errors, affecting the results obtained. The aim of this review was to examine studies of the equity of access to food outlets to determine the suitability of the methodology employed to deal with the distribution of the data. Our secondary aim was to assess whether spatial autocorrelation was considered.

Methods:

Searches were conducted in health science databases, including Medline and PsychINFO, for articles published from January 2000 to March 2014. Eligible studies included an objective outcome measure of the neighbourhood food environment, mapped using geographic information system (GIS) software, and a measure of neighbourhood-level SEP. Neighbourhoods had to have been defined using small area measures such as census blocks or postcode districts.

Results:

Fifty-four papers were included. Outlet accessibility was typically defined as either the distance to the nearest outlet from the neighbourhood geographic or population-weighted centroid, or as the number of food outlets within a neighbourhood (or pre-specified buffer), some adjusting for population or area size. Statistical analysis techniques adopted included one-way analysis of variance, correlation, and Poisson or negative binomial regression. Although the majority of studies featured geographically contiguous areas, few considered spatial analytical techniques or adjusted for spatial autocorrelation in analysis.

Conclusions:

With advances in GIS software, it is possible to consider sophisticated measures of neighbourhood outlet accessibility. However, approaches to statistical analysis often appear less well-considered. Care should be taken to consider the spatial nature of the data and the possibility of correlated residuals which could affect the results obtained.

SO2.1.2

Equity of access to fast food outlets in Victoria, Australia: A comparison of statistical methods

Karen Lamb, Lukar Thornton, Ester Cerin, Kylie Ball
Deakin University, Melbourne, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objectives:

The hypothesis that food outlets are inequitably distributed across neighbourhoods of varying levels of disadvantage has been tested in numerous studies, with findings somewhat inconsistent. The statistical approaches utilised in these studies vary and while there is a need to consider spatial issues in these analyses, such as spatial autocorrelation, many studies do not use appropriate analytical techniques which can lead to incorrect inferences about associations.

Methods:

Using data on the location of the four major chain fast food outlets (McDonald's, Hungry Jacks, KFC, Red Rooster) in Victoria, Australia as an example, we examined the distribution of outlets by neighbourhood-level socioeconomic position (SEP) with and without adjustment for population size. Our aims were to compare commonly used statistical methods (one-way ANOVA, Kruskal-Wallis, Poisson and negative binomial regression) to identify whether the choice of technique affects the results obtained. Furthermore, we aimed to examine the spatial autocorrelation in the distribution of outlets, determining whether accounting for neighbourhood-level predictors accounted for any observed correlation.

Results:

We identified discrepancies in the results dependent on which method was adopted. After adjustment for population size, all methods found evidence of an association between SEP and the number of fast food outlets at the 5% significance level, apart from the one-way ANOVA which found weak evidence of an association ($p=0.07$). From pairwise comparisons, all studies, apart from the one-way ANOVA, found evidence of higher access in the most disadvantaged neighbourhoods compared to the least disadvantaged. Poisson regression identified more pairwise differences than the other methods employed.

We found weak positive spatial autocorrelation in the distribution of major chain fast food outlets in Victoria ($p=0.06$, pseudo p -value=0.03). Adjustment for neighbourhood-level variables resulted in no evidence of remaining residual spatial autocorrelation.

Conclusions:

In studies involving neighbourhood-level data, care should be taken to respect the nature of the outcome distribution in the analysis as well as any spatial structure in the data. Research using spatial data should examine and adjust for spatial autocorrelation where necessary. Failure to adopt appropriate methodologies and to account for spatial autocorrelation can lead to incorrect inferences and can cause problems when comparing studies.

SO2.1.3

Promoting local foods in rural retail food outlets to improve dietary quality

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SIG: Yes, Policies and environments

Awards: No

Purpose: Retail food venues, including supermarkets and farmers' markets, are important points of healthy food access for rural residents. A recent approach to improve healthy food purchasing at both of these venues has been the promotion of locally sourced foods. In order for interventions like this to be effective, more understanding is needed about the use of these venues for local food shopping, and how the concept of promoting «local» may help improve rural dietary patterns. Our research aimed to understand factors that influence shopping for local foods at these outlets.

Methods: We used a mixed-methods formative approach, including food store audits, Geographic Information Systems (GIS), questionnaires and in-depth qualitative interviews of retail food store shoppers. Participants included lower-socioeconomic status individuals from a rural U.S. state who were recruited from the local Health Department, Department of Social Services, by customer intercept, or via random digit dial. Quantitative data were analyzed using descriptive, bivariate, and regression statistical techniques. Qualitative data were transcribed verbatim, double coded, and a theme analysis was conducted. Local food outlets (farmers' markets and produce stands) were geocoded and analyzed in ArcGIS.

Results: Food store audits showed an average price savings at farmers' markets compared to supermarkets for equivalent fruits and vegetables, indicating potentially greater financial accessibility at farmers' markets. Qualitative findings indicated that physical access, transportation, acceptance of food assistance program payments, freshness of produce, support for local agriculture, and the community aspect of local food sourcing were important factors in shopping for local foods. Farmers' market shopping was associated with awareness of the location of farmers' markets (0.18 (.04), $p < .001$). Participants were increasingly willing to shop for local foods when price savings ($\approx 20\%$) and accessibility (within 10 minutes) increased. Rural counties had fewer overall local food outlets, and percent African American was negatively associated (0.012 (0.0029), $p < 0.0001$) with local food outlet count.

Conclusions: The understanding gained from this research could be used to guide policy and intervention efforts aimed at increasing fruit and vegetable consumption in rural areas through the promotion of local foods.

SO2.1.4

The environment of mothers' main supermarket relates to their dietary behaviour through psychological and perceived affordability factors

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: A healthy maternal diet is associated with optimal growth and development in infants and children, and better maternal health. Few studies have comprehensively assessed the relationships between environmental, social and individual factors and dietary behaviour. This is the first UK study to explore how a range of environmental, social and individual factors relate to the dietary behaviour of mothers with young children, using Structural Equation Modelling (SEM).

Methods: 753 mothers from Hampshire, UK, reported complete data in a cross-sectional survey of dietary behaviours, demographic and psychological characteristics, and perceptions of food access and affordability. Observational data described two environmental factors: the environment of main supermarket measuring price, placement and promotion of a range of healthy and less healthy foods, and spatial access to food outlets using activity spaces. Data about the nutrition environment of Sure Start Children's Centres were obtained from staff, and considered as a third environmental factor because mothers with young children frequently visit these centres. A theoretical model linking environmental constructs to dietary behaviours through psychological and perceived environmental constructs was tested using SEM.

Results: The environments of mothers' main supermarkets were indirectly related to dietary behaviours through psychological and perceived affordability factors. Shopping at supermarket classified as having a healthier in-store environment was associated with positive psychological attitudes to healthy eating (standardised regression weight ($b=0.14$, $p=0.02$) and fewer food affordability concerns ($b=-0.14$, $p=0.01$), which in turn related to healthier dietary behaviours ($b=0.55$, $p<0.001$ and $b=-0.15$, $p=0.01$ respectively). The three environmental factors were not directly associated with dietary behaviour ($p>0.1$). The overall model fit was good (CFI=0.91, RMSEA=0.05 [0.05, 0.06]).

Conclusions: These findings provide empirical evidence that mothers' dietary behaviours are associated with both the environment of main supermarket and individual factors.

Multifactorial interventions targeting the environment of less healthy supermarkets, as well as psychological and affordability factors related to healthy eating, could improve the dietary behaviours of young families.

SO3.1. SHORT-ORAL: Physical activity/Sedentary Behavior, Adults

SO3.1.1

"Keeping your body and mind moving": an ethnographic study of aspirations for active ageing

Cornelia Guell, Guy Shefer, Simon Griffin, David Ogilvie
University of Cambridge, Cambridge, UK

SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Physical activity decreases in later life, at a time when prevention of chronic conditions and their complications is important. Physical activity has significant health benefits for older adults, improving physical and mental health, mobility and independence. However, interventions to promote activity in older adults have typically produced only small or short-lived changes. Using a combination of conversational and observational qualitative methods, we aimed to explore perceptions, practices and motivations relating to active and sedentary living in later life.

Methods: Two researchers conducted semi-structured interviews with 27 participants (65–80 years of age) in the EPIC-Norfolk cohort study in the UK, purposefully selected by gender, age, occupational class, whether living alone or with a partner, and step count. They then joined 17 of them for about 25 hours of participant observation focused on time-bound activities chosen by the participants. These included structured exercise or art classes, meditation, private or organised walks, cycling, shopping, gardening, dog walking and visits to workplaces. Thematic content analysis of verbatim transcripts and ethnographic field notes was conducted with the help of NVivo10.

Results: Framed within Bourdieu's concept of habitus, we explored internalised motivations shaped within social worlds and structures. All participants regarded a positive attitude as important for healthy ageing; this included staying active, both physically and mentally through sedentary activities such as reading and crosswords. 'Getting out of the house' was regarded as both an important motivator and a description of their activity level. Those who reported busy lives were mostly still engaged in paid or voluntary work, as well as caring responsibilities and a variety of interests. These participants regarded themselves as more socially connected and active than those with singular interests. Many reported adapting previous, often lifelong, activity preferences and habits to their ageing body; some participants replaced sports and exercises with low-impact activities such as walking. This included adapting to the physical limitations of partners and friends which dictated the intensity and frequency of shared activities.

Conclusions: To promote physical activity among older people may require more attention to social context, and initiatives encouraging broader activity habits rather than discrete activities.

SO3.1.2

Challenges of being new to Canada: Considerations for physical activity

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose. Research has demonstrated that immigrants to Canada are less likely to be physically active compared to non-immigrants (Pérez, 2002). Little is known about the interrelations between personal and environmental factors that influence physical activity for newcomers to Canada (Frisby, 2011). Therefore, the goal of this study was to understand how the experience of being new to Canada impacts opportunities and participation in physical activity.

Methods. Two focus group interviews were conducted. The first group (n=14) was comprised of multicultural health brokers who were immigrants to Canada. The second group (n=7) were newcomers to Canada and were part of an English as a second language class. Interviews were recorded and transcribed. Qualitative description was employed to understand the everyday experiences of participants (Sandelowski, 2002). Content analysis was used to identify themes consistent with the research question. Rigour was achieved through multiple coders, peer debriefing, and an audit trail.

Results. An overarching theme describing the *transition to Canadian life* was identified and encompassed four interwoven subthemes: *family, isolation, cost and climate*. Family represented physical activity support through family activities, yet challenged engagement due to obligations of care (e.g., need to work). Isolation barriers were tied to lack of community support and connections, and language differences that prevented access to recreation facilities and programs. Cost was a major limiter of opportunities to access activities (e.g., leisure cards) and long working hours, to alleviate financial stress, led to less leisure time and high fatigue. Finally, the cold climate was a distinct barrier for newcomers to Canada. The four subthemes are discussed using a social ecological model (McLeroy et al., 1988) and implications for practice and policy are suggested including enhanced community engagement (Task Force, 2002), and organizational modifications (e.g., extended recreation centre hours).

Conclusions. Overall, the development of physical activity policies and practices targeted at newcomers to Canada should consider their perspectives and experiences. Newcomers to Canada offer a unique and valuable lens through which to develop relevant solutions to the challenges associated with increasing physical activity.

SO3.1.3

Desk bound: socio-demographic, work-related, health and social-cognitive correlates of objectively measured workplace sitting time

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Sedentary behaviour is associated with a range of adverse health outcomes. Office-based workers, in particular, accumulate much of their total daily sitting time at the workplace, making it a priority setting for interventions. However, despite growing interest in the efficacy of work-related interventions, little is known about the correlates of workplace sitting which is important for informing intervention design and tailoring to sedentary sub-populations. This study aimed to explore the socio-demographic, work-related, health and social-cognitive correlates of workplace sitting time amongst office-workers.

Methods: We analysed baseline data from 'Stand Up Victoria' - a cluster-randomised trial involving government office-workers (predominantly administrative roles) in Melbourne, Australia. 147 women and 68 men were included in the analyses (mean age 45.5 years, range: 23.6-65.2 years). Socio-demographic, work-related, health and social-cognitive attributes were assessed through a self-administered, online survey. Sitting, standing and stepping in the workplace were measured using activPAL3 monitors worn for seven days. Linear mixed models examined the attributes associated with higher volumes of workplace sitting.

Results: Overall, participants spent a median of 6.8 hours sitting at work (IQR: 6.1-7.5 hours); or, 80.5% (IQR: 74.6-85.3%) of working hours. Only 12.6% of work time was spent standing and 6.6% stepping. Men and women did not differ in work sitting time. Linear mixed models showed higher volumes of workplace sitting (minutes) to be associated with working full-time (ref: part-time; $\beta=49.1$, SE=16.7), spending a higher proportion of work time at the desk ($\beta=1.8$, SE=0.4), and a desire to sit for 30-50% (ref: <30%; $\beta=27.4$, SE=12.2) or 50-80% ($\beta=27.7$, SE=13.4) of work time. Workplace sitting was not significantly associated with: occupation, socio-demographic attributes (age, marital status, education, ethnicity), health-related attributes (BMI, smoking status), nor with social-cognitive constructs (knowledge, self-efficacy, perceived behavioural control, self-regulation strategies).

Conclusions: Over four-fifths of work hours were spent sitting in this office-based population. Work-related factors emerged as the correlates of higher sitting time, suggesting that job design may be a key consideration for sitting-reduction strategies. Further research should investigate correlates of workplace sitting across more diverse occupations and job requirements to elucidate other potentially modifiable attributes associated with high workplace sitting.

SO3.1.4

Embracing the weekend warriors: implications of changes in global recommendations on physical activity classification and measurement

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

In 2010, WHO recommendations for aerobic physical activity (PA) changed from *30 minutes at least five days per week* to *150 minutes throughout the week*. Consequently, accumulating 150 minutes of PA by being active on 1-4 days per week was previously classified *insufficiently active*, but is now classified *sufficiently active* according to the new recommendations. This has implications for measurement tools designed to classify sufficient PA according to the old recommendations. Our aim was to assess how the change in PA recommendations has influenced: 1) misclassification of sufficiently active people; 2) utility of a previously validated single-item measure.

Methods:

We re-analysed data from the first validation study of a single-item PA measure (n=66). Data comprised 7 days of accelerometry and responses to: "In the past week on how many days have you done a total of 30 minutes or more of PA, which was enough to raise your breathing rate?" The percent concordance and kappa statistic for meeting the old vs. new PA recommendations was assessed using the accelerometer data. Agreement between the single-item measure and accelerometer results for both the old and new recommendations was assessed using a kappa statistic and by reporting changes in the correct identification of sufficiently active (i.e. specificity) and insufficiently active (i.e. sensitivity) participants.

Results:

Despite 74% concordance for meeting the new vs. old PA recommendations (kappa=0.50, 95%CI=0.32-0.68), the number of people meeting recommendations increased by 94% (n=17). Agreement between the single-item measure and accelerometer outputs was better for the old (kappa=0.39, 95%CI=0.14-0.64) than the new recommendations (kappa=0.26, 95%CI=0.07-0.46). Although the sensitivity of the single-item measure was better for the new recommendations (old=83%, new=87%), the specificity was worse (old=56%, new=40%). There was also a notable increase in the number of participants who incorrectly reported being insufficiently active when comparing the old (n=8) to the new (n=21) recommendations.

Conclusions:

Adopting the new global PA recommendations almost doubled the number of participants classified as sufficiently active in this sample. A previously validated single-item PA measure poorly identified sufficiently active participants according to the new recommendations. Developing new short survey methods for PA may be warranted.

SO4.1. SHORT-ORAL:

Food security and community nutrition interventions

SO4.1.1

Evaluation of a long-running community-based nutrition education program

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: There are few long-running adult nutrition education programs that have been comprehensively evaluated. FOODcents is community-based adult nutrition education program that has been running in Western Australia (WA) for more than two decades. The program is delivered to around 2,500 Western Australians each year via an ongoing collaboration between three non-government organisations (NGOs) - Cancer Council WA, the Australian Red Cross, and Foodbank WA. While anyone can register to attend the free courses, the course content and delivery style have been developed to cater for the needs of participants with lower levels of nutrition literacy. A two-year evaluation was recently completed to assess whether FOODcents meets its objectives of (i) improving participants' nutrition-related knowledge and (ii) changing their food purchase and consumption behaviours. The results contribute to the limited evidence base relating to the ability of these kinds of programs to improve nutrition outcomes.

Methods: Over a two-year evaluation period, a multi-method approach was used to access a broad range of FOODcents participants. Surveys (hard copy in-session questionnaires and a follow-up online questionnaire), focus groups, and participant observations generated data relating to various aspects of the program. More than 1,000 program participants were involved in the evaluation. The quantitative data were analysed with SPSS v22 and the qualitative data were analysed using NVivo10.

Results: Both the qualitative and quantitative data indicated that the FOODcents program content provides new information to participants and that they actively use their new knowledge to improve their diets. Statistically significant improvements were identified in reported fruit and vegetable consumption and reported consumption of fast food decreased. Participants of lower socioeconomic status were more likely than others to report favourable changes in their diets. This is particularly important in the context of obesity rates being higher among the disadvantaged.

Conclusions: The results provide support for the use of community-based programs to increase nutrition knowledge and healthy eating behaviours among adults. Such programs are likely to be an important component of comprehensive policies to address nutrition-related health problems.

SO4.1.2

Perceived and Geographic Food Access and Food Security Status among Households with Children

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: Few studies have examined the relationship of neighborhood food access and food security status in households with children. In this study, we examined the association of both perceived and geographic food access with food security status among households with children.

Methods: The data were from the Midlands Family Study including 544 households with children in eight counties in South Carolina. Food security status was classified into three categories, food secure (FS), food insecure, and very low food security among children (VLFS-C). Participants' perceptions of neighborhood food access were assessed by a standard instrument, and geographic food access was evaluated by distance to the nearest supermarket and grocery store. Multinomial logistic regression models were used to examine the associations.

Results: Perceived lack of access to adequate food shopping was more of a problem among VLFS-C households than FS households (Odds Ratios (OR)=0.56, 95% Confidence Interval (CI): 0.42, 0.75). VLFS-C households had a 36% reduction in the odds of perceived access to affordable fruits and vegetables compared to FS households (OR=0.64, 95% CI: 0.53, 0.77) and reported worse selection and quality of fruits, vegetables, and low fat products in their neighborhoods. Food insecure households reported more opportunities to purchase fast food (OR=1.22, 95% CI: 1.02, 1.45). None of the geographic access measures were significantly associated with food security status.

Conclusion: VLFS-C households reported lower ratings on perceptions of access to healthful and affordable foods than food secure households, while mapped data did not confirm it. Perceived food access was clearly a problem among VLFS-C households in our study population, but there are no differences to spatial access the supermarkets and grocery stores. Further research is needed to understand what determines a person's perception of their neighborhood food environment and how this is related to food shopping behaviors, local food prices, and mode of transportation in relation to food security status.

SO4.1.3

Provision of monetary incentives and changes in the placement of foods within food outlets to enable purchase of healthier foods and drinks.

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School of Molecular Bioscience, The Charles Perkins Centre, The University of Sydney, Sydney, New South Wales, Australia

SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose/Objective: Food environment plays a fundamental role in tertiary students' dietary behaviour given that onsite food outlets may be their only options available. Among the approaches to create healthier food environments is provide monetary incentives for, and to increase access of healthy food sold in outlets. The aims of this study were twofold, firstly to assess if price incentives such as healthy combination meal deals were associated with increased purchases of healthy food items and secondly to investigate whether changing placement of food items would affect food choices.

Methods: Combination healthy meal deals were offered to students in one of three food outlets on an urban university campus and changes to purchasing patterns over a 6 week period compared to a control outlet to identify the impact of healthy meal deals on purchases of healthy foods. In the third outlet, the campus convenience store, the placement of food categories chips/crisps and processed snacks, chocolate and confectionery and muesli bars, nuts and dried fruits were manipulated according to 3 conditions: (1) equal access to healthy and unhealthy foods, (2) unhealthy food more accessible, (3) healthy food more accessible. Daily food sales data were used to assess food choices of customers.

Results/Findings: The healthy combination deals led to an increase in proportional sales (2%) of healthier food combos and less-healthy food sales decreased by 1.5% during the intervention ($p=0.05$). Manipulating food accessibility according to the 3 conditions resulted in (1): 34% healthy and 66% unhealthy sold, (2): 29% healthy and 71% unhealthy sold and (3): 39% healthy and 61% unhealthy sold, respectively. Sales of some food items such as muesli bars increased when they were more accessible ($p=0.04$) but no significant change in chips/crisps or processed snacks ($p=0.07$) and chocolate sales ($p=0.15$) occurred. Average profits were not affected by the interventions.

Conclusions: Reducing cost and increasing accessibility of healthy foods in a tertiary education setting may lead to improvements in some food choices. Since determinants of food choices are multi-factorial; the availability and variety of unhealthy foods and decreasing shelf space devoted to unhealthy food items should be investigated in future research.

SO4.1.4

Baseline Characteristics and Psychometric Properties of Hunger Coping Behavioral Strategies among a Very Low-Income Population in the Midwestern United States

Courtney Pinard, Teresa Smith, Hollyanne Fricke, Eric Calloway, Amy Yaroch
Gretchen Swanson Center for Nutrition, Omaha, USA

SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose:

To describe the development and testing of a new survey to assess hunger-coping behaviors in a very low-income population in Midwest United States, as well as baseline characteristics.

Methods:

Hunger coping items were developed based on existing literature and resulted three scales: choosing between food and necessities (5-items), financial coping strategies (5-items), and rationing strategies (5-items)). The survey also included the 6-item USDA Household Food Security Survey Module (FS), items assessing physiological hunger symptoms, and sociodemographic information. Respondents were low-income adults aged 19 and older, who were caregivers to at least one child. Respondents were recruited from public libraries, food pantries and other public locations and completed the survey on an iPad, which took approximately 30 minutes. Respondents received a \$7 gift card incentive.

Results:

The sample was 75% female, 51% non-Hispanic African American, 15% Hispanic, and 34% non-Hispanic White, and 73% reported a household income of less than \$20,000 a year. The newly developed hunger-coping scales and the existing physiological hunger scale demonstrated acceptable internal consistency with Cronbach's alpha or Kuder-Richardson values ranging from 0.70-0.90. The three hunger-coping scales demonstrated acceptable inter-scale correlation and construct validity ($rs=0.42-0.59$, $ps<0.001$). Correlations among the hunger coping scales and FS scores demonstrated content validity ($rs=0.49-0.62$, $ps<0.001$). Correlations between hunger-coping scales and physiological hunger demonstrated predictive validity ($rs=0.50-0.68$, $ps<0.001$). Separate one-way ANOVAs and subsequent post-hoc analyses revealed that the more likely to report putting financial resources toward non-food necessities ($F(2,297)=42.54$, $p<0.001$), increased use of financial coping strategies ($F(2,287)=70.77$, $p<0.001$), and increased use of rationing strategies ($F(2,284)=69.19$, $p<0.001$), were associated with decreased household food security.

Conclusions:

The results support the use of these newly developed hunger-coping and physiological hunger scales among a very low-income population and indicate that hunger-coping and physiological hunger are more likely experienced by individuals suffering from decreased household food security. These results also have implications for obesity prevention and food insecurity research and the recommendation of incorporating these types of scales into general nutrition surveillance and intervention research to explore other factors that may intersect with food insecurity and obesity.

SO5.1. SHORT-ORAL: Weight Control, Loss and Maintenance

SO5.1.1

Breaking Bad (Habits): A synthesis of qualitative research on weight loss maintenance

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SIG: Yes, Motivational Dynamics

Awards: No

Objectives: To identify the range of factors and strategies that influence weight-loss maintenance and to generate a conceptual model that might inform future interventions.

Methodology: We used systematic search strategies to identify peer-reviewed papers published since 1990 in English which provided qualitative accounts of the views of the experiences of adults trying to maintain weight-loss. This identified 23 eligible studies. We conducted a thematic meta-synthesis of the findings using thematic synthesis methods described by Thomas and Harden. We integrated the findings into a model of the processes involved in weight-loss maintenance, and used the model to develop ideas for feasible interventions that could help people sustain their weight-loss.

Results: The central concept of our model is that changing one's lifestyle to lose weight generates a tension or inner conflict, and that the challenge of weight-loss maintenance is to manage this tension, or preferably to resolve it without relapsing to one's former obesogenic lifestyle. Individuals entering the maintenance phase embark on a cyclic process in which the experiences of trying to maintain weight-loss can lead to increasingly stable behaviour patterns, and successful maintenance, or increasingly unstable patterns, often ending in relapse. The outcome depends on several factors: developing insights; self-regulation of thoughts, feelings and behaviours; management of external influences on behaviour; identity change and change in habits (disruption of old habits and consolidation of new ones). Individual assessment of these skills, including the identification of the sources of 'maintenance tension' (e.g. personal needs served by the prior obesogenic behaviours) may be important to allow the tailored selection of appropriate strategies and support processes.

Conclusions: The resulting model of weight-loss maintenance is being used to develop a weight loss maintenance.

SO5.1.2

Cluster analysis of behavioural weight management strategies and associations with weight change in young women: a longitudinal analysis

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Background:

Maintaining a healthy weight is important for the prevention of many chronic diseases. Little is known about the strategies used by young adult women to manage their weight, or the effectiveness of these strategies in preventing weight gain.

Objectives: To identify clusters of weight control strategies used by women aged 22- 27 in 2000 and determine the average annual weight change among women in each cluster from 2000 to 2009. Sociodemographic and health characteristics of women in each cluster were also assessed.

Methods: Latent cluster analysis of weight control strategies of 8125 participants in the Australian Longitudinal Study of Women's Health.

Results: Weight control strategies were used by 79% of the women, and four unique clusters were found. The largest cluster group was named 'dieters' as 90% of the women in this cluster had been on a diet in the past year, and half had lost 5 kg on purpose. These women cut down on size of meals, fats and sugars and took part in vigorous physical activity; 20% had used a commercial weight loss programme. The next largest cluster was the 'healthy living' group who followed public health messages to eat less and move more. The third cluster was named the 'do nothing' group as they did not actively control their weight. The final cluster was named 'perpetual dieters' as these women used all the identified strategies, including unhealthy behaviours such as using laxatives, smoking and vomiting. On average women gained 700 g per year; the perpetual dieter group gained significantly more weight (880 SD 1560 g/year) than the 'do nothing' group (640 SD 1210 g/year, $p < 0.001$).

Conclusions: Most of the women were actively trying to control their weight. The most successful approach was to follow public health guidelines on eating and physical activity.

SO5.1.3

A new scale to assess weight-management strategies: Development, construct validation, and association with dieting success

Carmen Keller, Michael Siegrist
ETH Zurich, Zurich, Switzerland

SIG: Yes, Motivational Dynamics

Awards: No

Objective:

Energy-dense foods are easily available every day. To maintain a normal body weight or reduce an increased body weight, people must adopt effective weight management strategies. Previous research focused on samples of overweight people. Little is known about the strategies of the general population, partially due to a lack of scales. Existing scales assess only selected strategies (e.g. portion control) and combine conceptually different strategies in sum scores. In three studies, a new, comprehensive, theoretically derived, evidence-based scale with subscales representing conceptually differentiated strategies was developed.

Methods:

In study one, the strategies were collected. The five main strategies of health self-regulation (Mann, de Ridder & Fujita, 2013)—goal setting and monitoring; prospection and planning; automating behavior; construal; and inhibition—were used to categorize the weight management strategies. They were derived from (1) research on self-regulation, food intake, and weight, (2) research on successful weight loss and weight loss maintenance, and (3) expert interviews. Items were generated to assess each strategy. In study two, a postal survey in a random sample from the general population (N=658) was conducted to develop the scale using explorative factor analysis. In study three, an Internet survey in a quota (age, gender) sample from the general population (N=616) was used for a confirmatory factor analysis. Reliability and construct validity were examined.

Results:

Study one revealed 19 strategies that were allocated to the five main strategies of self-regulation, and 93 items were formulated. Study two resulted in the expected 19 factors including 63 items. Study three revealed a good model fit (CFI=.912; RMSEA=.043). Most reliabilities of the subscales were high. The correlations with the two existing scales indicated good construct validity. Significant correlations between most strategies and the perceived success of dieting were found in participants who limited food intake to control weight at the time of the study (N=274).

Conclusions:

The new scale, with its good psychometric characteristics, assesses conceptually differentiated weight management strategies. It provides important insights into the general populations' daily strategies for successful weight management. This may facilitate tailoring and evaluating health communication and intervention programs.

SO5.1.4

Weight-Loss Self-Efficacy: A Predictor or Outcome of Weight-Loss?

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The study examined the temporality of the relationship between changes in weight and weight-loss self-efficacy (WLSE) during the implementation and maintenance phases of a minimal, internet-delivered worksite weight loss intervention, with or without modest monetary incentives, over a 24 month period.

Methods: A pragmatic cluster randomized controlled trial was administered in 28 small to medium sized worksites in Virginia. Participants (n=1790) had a BMI >24 kg/m² and provided objectively measured weight and self-reported WLSE at five time points (baseline, 6-, 12-, 18- and 24-months). Analyses were conducted for participants who had WLSE or weight data at all time points used in each model. Latent growth models were estimated with robust maximum likelihood to adjust for systematic differences between worksites. A cross-lag panel analysis was used to test the temporality of potential causal relationships. Models were compared that specified a change in WLSE from time 1 to time 4 predicting change in weight from time 2 to time 5 while controlling for baseline weight (Model 1) and a change in weight from time 1 to time 4 predicting change in WLSE from time 2 to time 5 while controlling for baseline WLSE (Model 2).

Results: Outcomes for intervention groups (incentive vs. no incentive) did not differ, therefore groups were collapsed and models were run using the combined sample. Model 1 (n=891) demonstrated acceptable fit ($\chi^2(df)=200.861(29)$, RMSEA(90% CI)=.082(.071,.092), CFI=.956, SRMR=.051) and indicated that a linear decrease in WLSE supported by the initial unconditional model ($\beta=-1.710$, $p<.001$) was followed by a linear increase in weight ($\beta=-0.810$, $p=.013$). Model fit for Model 2 (n=869) was also acceptable ($\chi^2(df)=138.801(30)$, RMSEA(90% CI)=.065(.054,.076), CFI=.964, SRMR=.048) and demonstrated closer fit than Model 1. Parameter estimates for Model 2 indicated that a linear decrease in weight supported in the initial unconditional model ($\beta=-1.031$, $p<.001$) significantly predicted a linear increase in WLSE ($\beta=-0.685$, $p<.001$).

Conclusion: These data support the hypothesis that weight loss success leads to increased WLSE, but also suggest that WLSE is an outcome, rather than a predictor, of weight loss.

SO6.1. SHORT-ORAL: Weight management in pregnancy

SO6.1.1

Social Inequality in Body Mass Index and Gestational Weight Gain in the First and Second Pregnancy Among Swedish Women

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: High pre-pregnancy body mass index (BMI) and inappropriate gestational weight gain (GWG) are associated with adverse short and long term maternal and neonatal outcomes, but their social patterning is not well established. The objective of this study was to investigate the association between education and weight status and GWG in two subsequent pregnancies among Swedish women.

Methods: The study includes 117 769 women born in Sweden, having their first and second singleton birth in 1982-1998. We investigated the association between women's educational attainment and their pre-pregnancy weight status and adequacy of GWG, in both the first and second pregnancy. We carried out multinomial logistic regression models adjusting for child's birth year, mother's age and smoking status, and additionally birth interval for the second pregnancy.

Results: Compared to highly educated women, women with a lower education were at increased risk of starting their first and second pregnancies at an unhealthy weight. Women with excessive GWG in the first pregnancy had a greater increase in BMI between pregnancies, and increased odds of being overweight or obese before the next pregnancy. This effect was strongest among less educated women. Among women who started their pregnancy at a healthy weight status, lower education was associated with excessive GWG in both pregnancies. No educational gradient in GWG was observed among obese women in either pregnancy.

Conclusions: Lower educated women had a larger BMI increase between pregnancies than high educated women, and these social inequalities were greater among women who gained weight excessively in the first pregnancy. As modifiable risk factors on the path to overweight/obesity, the importance of a healthy pre-pregnancy BMI, appropriate GWG and returning to a healthy weight after pregnancy should be communicated to all women and health practitioners, as it may assist in reducing existing social inequalities in body weight.

SO6.1.2

Association of diet quality during pregnancy and pre-gravid weight status

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: A better understanding of the role of prenatal diet quality (DQ) and weight status is warranted to improve the effectiveness of behaviorally-based nutrition interventions designed to promote a healthy pregnancy. HEI-2010, a valid and reliable measure to describe dietary behaviors, provides an opportunity to assess overall nutrition intake summarized as one score according to the 2010 Dietary Guidelines for Americans. The present study evaluated the association between pre-gravid weight status and DQ during pregnancy.

Methods: Dietary intake from 124 pregnant women was analyzed for total energy, macro- and micronutrient content, and foods groups using NutritionistPro™. Average intake was calculated from a three-day weighed diet record collected in early (12-19 weeks) and late (34-36 weeks) pregnancy. DQ was determined using the HEI-2010. DQ differences between pre-pregnancy BMI categories (normal, overweight, and obese) were analyzed using one-way ANOVA ($p < 0.05$).

Results/findings: DQ score for obese women ($n = 16$; 46.4 ± 11.2 ; 50.7 ± 9.8) was significantly lower than normal ($n = 73$; 57.4 ± 12.8 ; 59.8 ± 13.4), and overweight ($n = 35$; 58.4 ± 10.7 ; 59.8 ± 11.6) women in early ($p < 0.003$) and late pregnancy ($p < 0.03$), respectively. A negative relationship was found between HEI-2010 and pre-pregnancy BMI in early ($r = -0.08$; $p < 0.002$) and late pregnancy ($r = -0.04$; $p < 0.03$). DQ for the majority of participants qualified as "needs improvement" in early (65%) and late pregnancy (67%). Scores for empty calories for obese women were significantly higher than normal weight women in late pregnancy ($p < 0.02$). Total fruit and whole fruit scores were the highest; 44% and 51% met recommendations for whole fruit in early and late pregnancy, respectively. Total vegetable score were the lowest at both time points for all BMI categories, 8% and 5% met recommendations at early and late pregnancy, respectively.

Conclusions: DQ of pregnant women is suboptimal and is related to their pre-pregnancy weight status. With this knowledge, routine prenatal nutrition counseling to minimize empty calorie consumption and increase vegetable intake is warranted. Specific attention should be given to obese women as this group had the lowest overall HEI score and are at highest risk for multiple complications.

SO6.1.3

Changes in mode of commuting and weight gain in pregnant women

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Pregnancy is a period when large weight gain is the norm and with a presumed substantial change in mode of commuting. This makes pregnancy suitable as a model for examining the plausible, but in the scientific literature still unclear, association between active commuting and weight gain. We hypothesize that those women changing from an active mode of commuting to work or school pre-pregnancy to a less active mode in early pregnancy will have a larger gestational weight gain than those who continue active commuting from pre- to early pregnancy.

Methods: We analysed prospective data from the Norwegian Fit for Delivery (NFFD) study. Of 606 pregnant women enrolled in the study, 219 used active modes of commuting (cycle, walk, public transport) before pregnancy and were included in the present analyses. Of these, 66 women (30%) changed to a less active mode in early pregnancy (self-reported at study inclusion, around week 15). These 66 ("active-passive") were compared to those continuing active commuting ("active-active"). The women were objectively weighted at gestational weeks 15, 30, 36, and at term delivery. At inclusion, the women self-reported their pre-pregnancy weight. Linear mixed effects analyses of the repeated weight measures (gestational week 15, 30, 36 and at term delivery) were performed, adjusting for pre-pregnancy weight, and including the group*time interaction.

Results: There were no significant baseline differences between the two groups regarding maternal age, educational level, pre-pregnant weight, BMI, diet score or physical activity score. A significant overall group effect was observed for the four time points together (active-active group: 76.4 kg vs. active-passive group: 78.0 kg, difference 1.6 kg, $p=0.005$). The interaction term group*time was significant, indicating different weight gain throughout pregnancy for the two groups; the mean difference between the groups were 0.7 kg at week 16, 1.5 kg at week 30, 2.1 kg at week 36, and 2.3 kg at term delivery, respectively.

Conclusions: The present study highlights the importance of active commuting to work and school as an opportune public health measure in preventing excessive weight gain.

SO6.1.4

Development and pilot testing of the 'Eating4Two' smart phone application to limit gestational weight gain

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective:

The number of pregnant women who are obese is increasing, with important implications for birthing outcomes for both the mother and baby. Various interventions have attempted to assist women to manage their weight gain in pregnancy with limited success. A smart phone application (app) has been proposed as a convenient and cost-effective intervention.

Method:

This project involved the development of a smartphone app that includes a graphing function that allows the user to weigh in throughout the pregnancy and receive real-time feedback together with information on antenatal nutrition. The project was a collaborative effort between the disciplines of Nutrition and Dietetics, Midwifery, Public Health and Information Technology at the University of Canberra and stakeholder consultation was used to inform app development. The app was pilot-tested with ten pregnant women using a mixed-method approach via an on-line survey and qualitative interviews (two focus groups one individual).

Results:

The on-line survey reported that the 'Eating4Two' app was viewed by participants as a good source of antenatal nutrition information that is generally simple to use. Women expressed interest in not only learning new information but in recording, and having as a reference, the exact details of their gestational weight status. Transcripts from the focus groups and individual interview were analysed using inductive thematic analysis. Themes relating to user experience and acceptability were identified and include: (1) Functionality is important when navigating an app, (2) Pregnancy is a motivating time for women and (3) How far can an app go?

Conclusion:

Participants found the app to be a motivational tool but would have liked the graph to demonstrate numbers rather than a range for weight gain. They viewed the guidelines contained within the app library as credible but felt the information should be formatted in a more user-friendly way. The feedback provided by participants will assist with refining the current prototype for effectiveness testing. Bridging gaps in knowledge is an important step towards improving outcomes for both women and offspring. Encouraging the use of apps like 'Eating4Two' is one way this may be achieved.

SO1.2. SHORT-ORAL: Physical activity theory and correlates

SO1.2.1

Organismic integration as a dynamic process: A systematic review of empirical studies on change in behavioral regulations in exercise

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

In facilitating the initiation and adoption of physical activity (PA) behavior, attention should be directed towards the dynamic nature of motivation. However, few attempts have been made in self-determination theory-based research to clarify the process in which subjective reasons for behavior become part of the self (i.e. organismic integration). To provide a more comprehensive investigation of empirical data, this review examines the empirical literature on the dynamic nature of organismic integration theory (OIT) in exercise settings.

Methods:

This systematic review includes 34 prospective and experimental OIT-based studies published up to July 2014, each investigating changes in behavioral regulations in exercise over time, in adults (<18 yrs). Studies focusing on physical education or involving athletes were excluded. Findings are summarized through quantitative analysis of the evidence.

Results/findings:

With respect to the direction of change in the forms of behavioral regulations, most studies show no significant changes in controlled regulations, with the exception of introjected regulation, which shows some fluctuations over time. Conversely, autonomous regulations increase steadily over time. With respect to the timing of change in the forms of behavioral regulations, results indicate that introjected regulation does not change any further beyond 3 months. Moreover, autonomous regulations show increases from the first few weeks of exercise adoption onwards.

Conclusions:

Overall, the literature provides good evidence for the dynamic nature of motivation, demonstrating that behavioral regulations in exercise are changeable over time. In support of this, exercise instructors are advised to consider participants' subjective norms during PA initiation and adoption. Furthermore, as changes in autonomous regulations are observable within a few weeks, intervention effects are evaluable in the early stages of interventions.

SO1.2.2

Acute relationships between daily self-efficacy, physical activity, and self-worth in middle-aged women

Diane Ehlers^{1,2}, Jennifer Huberty², Matthew Buman², Steven Hooker², Michael Todd², Gert-Jan de Vreede³
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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Research provides strong evidence that self-efficacy and regular physical activity (PA) are predictive of self-worth in middle-aged women. Although self-efficacy is known to exhibit state-like qualities, few studies have examined acute relationships among daily self-efficacy, PA, and self-worth. Using ecological momentary assessment, the purpose of this study was to examine the influences of mean and daily self-efficacy and PA on daily physical and general self-worth in middle-aged women (35-64 years-old).

Methods: Participants (N = 59 women, *M* age = 49.2 ± 8.2 years) received three daily text message prompts for 28 consecutive days. Each prompt included a link to a mobile survey assessing self-efficacy and self-worth. Women concurrently wore an accelerometer (GENEActiv). Multilevel models were used to examine the predictive influences of self-efficacy and moderate to vigorous PA (MVPA) on physical (physical condition and body attractiveness) and general self-worth.

Results: Of 4,956 eligible observations, 3,573 were valid. Missing observations were due to missing/ineligible survey responses and accelerometer non-wear/malfunction. Women were 66.4 ± 36.47% confident they would participate in daily PA and participated in 5.59 ± 15.10 minutes of daily MVPA. Mean self-efficacy, daily fluctuations in self-efficacy, and mean MVPA were associated with physical condition ($p = 0.04$, $p < 0.001$, $p = 0.02$; within Pseudo- $R^2 = 0.16$, between Pseudo- $R^2 = 0.17$). Mean and daily fluctuations in self-efficacy were associated with body attractiveness ($p = 0.07$, $p = 0.03$; within Pseudo- $R^2 = 0.12$, between Pseudo- $R^2 = 0.02$); however, MVPA was not associated with body attractiveness. While mean self-efficacy and MVPA were not associated with general self-worth, daily fluctuations in self-efficacy and MVPA were associated with general self-worth ($p < 0.001$, $p = 0.004$; within Pseudo- $R^2 = 0.14$, between Pseudo- $R^2 = 0.07$).

Conclusions: Self-efficacy emerged as a consistent predictor of physical and general self-worth both across the 28-day study and at the daily level. Self-efficacy may, therefore, represent a promising daily target for improving PA and self-worth in women. Additional studies to identify mechanisms driving daily fluctuations in self-efficacy are warranted. Such research may inform the design of ecological momentary interventions to improve daily self-efficacy, PA, and self-worth in middle-aged women.

SO1.2.3

Perception of One's Core Network is Associated with Exercise Behavior

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective:

Physical activity is important for physical and mental health as well as for the prevention of obesity. Yet, worldwide physical inactivity is estimated at about 31%, and many people still remain physically inactive despite extensive prevention campaigns. This study aims to contribute to the understanding of physical inactivity by focusing on social network structures, which, to date, are less frequently studied in the literature than individual factors.

Methods:

For the data collection, a paper and pencil questionnaire was sent to a randomly selected sample of Swiss households ($N=591$). It included questions on various measures relating to physical activity, people's core network and demographic characteristics. As a common method of social network analysis, a name generator was used to collect ego-centric social network data. Thus, participants named up to five important persons and provided information about each one, including their role, gender and physical activity behaviour. Homophily measures in relation to physical activity were calculated, and a moderated multiple hierarchical regression analysis was conducted.

Results:

Participants perceived their core network as similarly physical active as themselves. Moreover, the strength of associations depended on the role of the named person; the strongest association was found between the participant and the first-mentioned person (the spouse in 65% of the cases). The results of the regression analysis showed that individual factors like age, health status, educational background, BMI, the habit of being regularly physical active and judging physical activity as important were associated with the number of days per week reported exercising ($R^2=.299$, $F(7,481)=30.70$ $p<.001$). Over and above these individual factors, the perception of the core network's physical activity behaviour was also significantly related to exercising ($\Delta R^2=0.010$, $F(2,479)=03.35$ $p<.050$). Moreover, there was significant interaction, indicating that inactive people reported more days per week exercising if they perceived their core network as regularly physically active ($\Delta R^2=0.006$, $F(1,478)=04.30$ $p<.050$).

Conclusions:

These findings support the claims of ecological models that public health interventions should include social network aspects and not only focus on individual factors. Inactive people should be encouraged to participate in physical activity together with their spouses or other members of their core network.

SO1.2.4

Predicting Sedentary Intentions and Behaviour: An Application of Protection Motivation Theory

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Multilevel determinants of sedentary behavior (SB), including constructs couched within evidence-based psychological frameworks, can contribute to more efficacious interventions designed to decrease sitting time. This study aimed to: 1) Examine the factor structure and composition of sedentary-derived Protection Motivation Theory (PMT) constructs and 2) Determine the utility of these constructs in predicting general (both non-volitional and volitional activities) and leisure (only volitional activities) sedentary goal intention, implementation intention, and behaviour.

Methods: Sedentary-derived PMT (perceived severity, PS; perceived vulnerability, PV; response efficacy, RE; self-efficacy, SE), goal intention, and implementation intention constructs as well as a modified SB questionnaire (Rosenberg et al., 2010) were completed by undergraduate students (69% female; $M_{age} = 19.44$ years, $SD = 1.81$). SE was broken into three psychological (productive, focused, tired), and two situational (studying, leisure) constructs to capture the main barriers to reducing sitting time. After completing socio-demographics and the PMT items ($n = 787$), participants were randomized to complete general (model 1) or leisure (model 2) intention items. Based on model assignment, they completed either the general or leisure SB questionnaire one week later ($n = 431$).

Results: Irrespective of model, principal axis factor analysis revealed that the PMT items grouped into eight coherent and interpretable factors (PS, PV, RE, and SE focused/productive, tired, watching TV/using the computer, studying in the library/Wi-Fi area, and using a cellphone). Using linear regression, general and leisure models predicted 5% and 6% of the variance in goal intention, 12% and 18% of the variance in implementation intention, and 6% and 7% of the variance in SB, respectively. Variables that made unique and significant contributions were: RE (general) and SE (leisure) for goal intention; PV and RE (general), PV, RE, and SE (leisure) for implementation intention; and only goal intention (leisure) for SB.

Conclusions: Support now exists for the tenability of an eight-factor PMT sedentary model. This framework is more useful for predicting implementation intention than goal intention or SB. Future interventions that targets leisure volitional behaviour will be discussed.

SO2.2. SHORT-ORAL: Prevention and community interventions in adults

SO2.2.1

The effectiveness of whole-of-community interventions by socioeconomic position: a systematic review

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: A common population approach to obesity prevention is the implementation of whole-of-community (WOC) interventions. A recent meta-analysis concluded that WOC interventions lead to modest reductions in population weight gain among children. Whether such interventions exhibit differential effectiveness across different socioeconomic groups within a community remains unknown. We aimed to summarise, for the first time, evidence of differential effectiveness of WOC interventions by socioeconomic position (SEP).

Methods: WOC interventions were defined as those targeting nutrition and/or physical activity behaviours within multiple environmental contexts, and utilising multiple strategies. The Medline electronic database and grey literature was systematically searched, and studies were included if they evaluated the effectiveness of a WOC intervention on anthropometric outcomes and/or energy balance behaviours, and reported results according to a measure of SEP. Standard data extraction methods were employed using the PICOCs framework, and were carried out by two independent reviewers. We examined a number of WOC intervention characteristics that may influence differential effectiveness by SEP. These included: interventions that changed the environment in which energy balance behaviours occur, the number of settings in which the WOC intervention acted in, the presence of community engagement, and whether equity was considered in its design. An adapted version of the Effective Public Health Practice Project quality assessment tool was used to assess the methodological quality of studies.

Results: Ten studies were identified for inclusion, which were a mix of longitudinal (n=6) and cross sectional (n=4) study design. Of these, eight reported a greater or equal effect among low SEP groups compared to high SEP groups. These studies commonly featured intervention components that changed the environment in which unhealthy behaviours occur, incorporated more than three settings, and/or employed community engagement. Overall conclusions did not change when considering only moderate to high quality studies (n=5).

Conclusions: WOC interventions represent an effective and equitable approach for the reduction of population weight. It will be essential that future WOC interventions are evaluated for their health equity impact to further delineate intervention components, so that the likely health equity impact can be optimised.

SO2.2.2

The Sydney Diabetes Prevention Program: weight loss maintenance at 4 years

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

The Sydney Diabetes Prevention Program (SDPP) was a translation study, delivered in a community setting through primary health care. The Program tested a modified type 2 diabetes prevention intervention in order to improve nutrition, increase physical activity and reduce weight. The aim of this study was to assess if participants maintained modest weight loss achieved during the 12-month program and if the program was effective at preventing or delaying the onset of diabetes.

Methods:

Using the Australian Diabetes Risk Assessment tool, doctors screened and referred eligible high-risk patients aged 50-65 years into a 12-month lifestyle modification program (n=1238 started the program). The intervention consisted of an initial individual session and three group sessions, followed by three-monthly health coaching phone calls and a final review after 12-months. Participants were contacted by telephone to self-report their weight and diabetes status at 24, 36 and 48-months after commencing the program. Repeated measures mixed models were used to determine the mean change in weight from starting the program in participants who had at least 1 follow-up time point (n=868, 70%).

Results:

Participants lost a mean of 2.0 kg (95% CI: -2.3, -1.6) during the program (12-months). At 24, 36 and 48-months mean change in weight from baseline was -3.3kg (95% CI: -3.6, -2.9), -3.0kg (95% CI: -3.4, -2.6) and -3.1kg (95% CI: -3.5, -2.8), respectively. Twenty-two participants developed diabetes during the program and 19 reported being told by a doctor that they have diabetes during the follow-up.

Conclusion:

This moderately intensive diabetes prevention program resulted in modest weight loss after 12 months which was not regained after 48 months. Diabetes status in the follow-up is being confirmed with referring physicians. Diabetes incidence will be compared to a matched cohort in the AUSDIAB study to see if the program was effective at preventing or delaying the onset of type 2 diabetes.

SO2.2.3

Millennials at Work: Are workplaces supportive of healthful eating, physical activity, and healthy weights for young adults?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: We know very little about the importance of workplace environments in promoting healthful weight-related behaviors and outcomes in young adults. The purpose of this study was to describe the workplace environments of young adults and examine associations with diet, physical activity and body mass index (BMI).

Methods: Drawn from participants of Project EAT (Eating and Activity among Teens and Young Adults), a diverse population-based sample, cross-sectional data from 1538 working young adults were examined. Survey measures were used to assess BMI, dietary intake, physical activity and perceptions of the workplace environment and surrounding neighborhood. Linear and logistic regression models adjusted for age, sex, ethnicity, and education were used to examine associations between workplace food and physical activity environments (e.g., estimated distance to gym or fast food, availability of soda and snacks, coworker support for healthy eating and activity) and BMI; fast food, sugar-sweetened beverage and snack intake; leisure-time physical activity; and active transportation.

Results: Over one third of young adults (mean age=25.4, SD=1.5) worked within a 30-minute walk from home and a five-minute walk from a fitness facility or fast-food outlet. More than 80% of young adults reported availability of soda and snacks/sweets at work; more young adults reported colleagues who care about physical activity (71%) than eating a healthy diet (66%); and only half indicated that it is easy to be active (58%) and to eat a healthy diet (50%) at work. In adjusted models, ease of being active ($b=-.80$, $p<.001$) and eating a healthy diet ($b=-.60$, $p=.01$) at work and a greater number of healthful workplace food environment characteristics ($b=-.42$, $p=.03$) were associated with a lower BMI. The direction of associations was similar for diet and physical activity outcomes, yet factors associated with specific outcomes differed across models. Perceived distance to fast-food outlets was not associated with any outcomes.

Conclusions: There is considerable room for improvement in the food and PA workplace environments of young adults, and some aspects of these environments were related to more favorable weight-related behaviors and outcomes. Employer- and community-initiated policies may represent one way to create healthier workplace environments for young adults.

SO2.2.4

Long-term cost-effectiveness of a combined lifestyle intervention aimed at improving quality of life from a societal perspective.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

The economic burden of an unhealthy lifestyle is high. Consequently, the cost-effectiveness of combined lifestyle interventions for adults with overweight and obesity is of increasing interest. Therefore, we studied the cost-effectiveness of two intensities of a combined lifestyle intervention to improve physical activity and nutritional behaviour. The one-year intervention comprises guidance by a team of a lifestyle advisor, physical therapist and dietician. Programs differ in amount of physiotherapy: 6 physiotherapy sessions in the start-up program versus 32-41 physiotherapy sessions in the supervised program. The objective is to increase quality of life and reduce healthcare utilization and subsequent costs in adults with overweight and obesity.

Methods:

In a clustered RCT (29 clusters) 164 participants were included in the start-up program and 264 were included in the supervised program. Healthcare utilization, quality of life (QALY) and health effects were assessed by means of self-administered questionnaires every three months during two years. A cost-effectiveness and cost-utility analysis was done from a societal perspective with a time horizon of 24 months. Differences in costs and effects are presented in Incremental Cost-Effectiveness Ratios. Uncertainty was assessed by means of 1000-times bootstrap and sensitivity analyses.

Results:

Baseline characteristics were comparable between the groups. Program costs of the supervised program were higher compared to the start-up program, but other healthcare costs during the intervention period of 12 months were lower for supervised program. Utilities increased in both groups after the start of the intervention, decreased somewhat and finally increased two years after the start. The overall two-year QALY was higher in the supervised program. After the one-year intervention the ICER revealed that the supervised program showed somewhat higher costs and somewhat higher effects compared to start-up, which was confirmed by bootstrap and sensitivity analyses.

Conclusions:

After one year, the more expensive supervised program showed less healthcare utilization, resulting in only slightly higher total costs with additional QALYs compared to the start-up program. Therefore the supervised program is perceived to be cost-effective. Moreover, it shows higher QALYs after two years. Further research and modelling is needed to assess whether this conclusion remains after longer follow-up.

SO3.2. SHORT-ORAL:

Nutrition and eating behavior over the lifespan

SO3.2.1

Tell us about exercise, not diet: adults' preferences for obesity-control messaging

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: As part of ongoing attitude tracking research relating to current anti-obesity media campaigns in Australia, this qualitative study investigated normal weight and overweight adults' preferences for various campaign message themes. The aim was to assess whether future communication strategies focusing on diet and/or physical activity would be equally acceptable to different target audiences.

Methods: Eight focus groups were conducted with adult Western Australians residing in Perth, Western Australia. The groups were segmented by age (18-29 years, 30+ years), gender, and weight status (normal weight, overweight/obese). On average the groups ran for 90 minutes, ranging in duration from 75 to 101 minutes.

Results: The focus group participants expressed a desire for specific behavioural recommendations in anti-obesity messages. This was perceived to be a more appropriate and useful approach than merely attempting to increase awareness of obesity as a health problem. While this sentiment was apparent among both normal weight and overweight participants, it was especially pronounced among those who were overweight. Many of these individuals reported that they felt that awareness-focussed messages made them feel negative about themselves but unable to address the highlighted problem. In terms of the content of messages containing specific behavioural recommendations, there was a distinct preference among participants for messages that focus on physical activity rather than diet. This appeared to be the result of a perceived greater level of control over their physical activity levels and the attribution of poor eating patterns to external factors that reduce their ability to consume a healthy diet (e.g., prevalence of fast food outlets, perceived high cost of healthy food, and pervasive junk food advertising). Locus of control therefore appeared to be a key construct of relevance.

Conclusion: The findings indicate that anti-obesity messages that focus on specific recommendations relating to methods of increasing physical activity are likely to be considered appropriate, acceptable, and useful by a broad range of adults. The consistency in responses between normal weight and overweight participants indicates that campaigns adopting this approach may be suitable for both the prevention and treatment of obesity because of their resonance with individuals of varying weight status.

SO3.2.2

Fear of fat phenomenon in young adolescent females and males

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: Current obesity prevention strategies identify schools, children and youth as prime intervention targets. In youth, health promoting efforts must consider the social dynamics of adolescence such as the development of autonomy. This study's initial purpose was to better understand the sociocultural dimensions of eating and physical activity in young teenagers. During data analysis, fear of fat emerged as an unexpected theme. Further inductive analysis and literature searches on this topic were thus carried out to explore this theme.

Methods: Fifty youth (22 girls, 28 boys) from four schools participated in one-hour long face-to-face interviews using a semi-structured interview guide. Schools were selected to maximize differences in socioeconomic status and ethnicity and were located in urban and rural areas. Interview topics were guided by the Ecological Systems Theory. Inductive thematic analysis of the transcribed interviews using N'Vivo was based on the scientific literature on fear of fat and adolescent's development. Fear of fat must be conceptually distinguished from "drive for thinness". The latter refers to an ideal to which one strives while "fear of fat" involves the stigmatization of body fat.

Results: More than half of adolescents mentioned fear of fat when they talked about their eating behavior and physical activity. Surprisingly, given the previous literature, we found a similar proportion of boys and girls that exhibited a fear of fat. Fear of fat was observed mainly in the schools that were classified as being middle and high income. In high income schools, more girls than boys showed fear of fat. Accordingly, this issue was barely mentioned by youth that attended school in the rural area.

Conclusions: Weight stigma and the social norm of thinness could in part explain youth's fear of fat. In addition, young teens experience morphological changes associated with puberty. Being uncertain of the body they will have once puberty has ended may make them particularly vulnerable to fear of fat. Finally, youth are not immune to sensationalist media coverage of obesity that reinforces stigma and individual responsibility at the expense of broader environmental determinants (Lorenc & Oliver, 2010; Cho & Salmon, 2007; Shapiro et al., 1997).

SO3.2.3

Changes in response to food and eating behavior following weight loss

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Previous research has revealed differences in response to food and eating behavior after weight loss. Decreases in hedonic hunger, defined as an individual's susceptibility to eat when presented with environmental food cues, have been shown to be associated with better long-term weight loss. Conversely, increased hunger and disinhibition have been associated with poor weight loss maintenance. The current study examined changes in food response and eating patterns in obese adults 6 months and 1 year after weight loss by either bariatric surgery or an intensive lifestyle weight loss program (ILWLP). It was hypothesized that changes in food response and eating patterns would be most pronounced among those receiving bypass or sleeve gastrectomy compared to gastric banding and the lifestyle program, as sleeve and bypass procedures have been associated with significant changes in gut hormones associated with ingestive behavior.

Methods: Obese participants enrolled in Heads Up, an ongoing insurance-sponsored observational study, completed the Power of Food Scale (PFS), the Three Factor Eating Questionnaire (TFEQ), the Questionnaire of Eating and Weight Patterns - Revised (QEWP-R) and demographic information prior to, at 6 months and 1 year after undergoing weight loss by either (1) ILWLP including a low calorie liquid diet phase, and a 20 week group behavioral intervention (n=246) (2) gastric banding (n=116) or (3) gastric bypass or sleeve gastrectomy (n=55).

Results: The changes in 6 month and 1 year scores from baseline were estimated using a linear mixed effect model adjusted for baseline covariates. TREQ scores showed significant changes ($p<0.01$) for all groups. Significant changes ($p<0.01$) were also observed in the PFS scores for the surgery groups, but not the ILWLP. The surgery groups showed larger albeit not significant changes on the QEWP-R. Further analysis showed the changes in scores occurred mostly at 1 year and not 6 months.

Conclusions: Changes in response to food appear more pronounced following bariatric surgery than a lifestyle program, despite impressive weight loss among the lifestyle group (14.5% at 6 months and 11.3% at 1 year). Findings will be discussed in terms of implications for weight loss maintenance.

SO3.2.4

Association between changes in added sugar intake and body mass index in older Australians

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: To investigate the association between changes in added sugar (AS) intake and body mass index (BMI) in older Australians during 15 years of follow-up.

Methods: Subjects were participants of Blue Mountains Eye Study (aged ≥ 49 years). Dietary and BMI data were collected in five-year intervals between baseline (1992-1994) and follow-up (2007-2009). Six hundred and seventeen participants who had dietary and BMI data at all three time intervals were included in the study. Dietary data were collected using a 145-item Food Frequency Questionnaire (FFQ). AS content of FFQ items was determined using recipes, food labels and other estimation methods. For each time interval, change in AS intake and BMI was assessed using paired t-test. In preliminary analysis, linear regression model was used to investigate the association between change in AS intake and BMI in each time interval. Each regression analysis was adjusted for gender, age, changes in energy and fat intake.

Results/findings: Mean (SD) AS intake at baseline and each successive follow-up were 46.5 (31.9) g, 51.3 (30.0) g, 51.2 (28.6) g and 46.5 (28.2) g, respectively. There was a significant increase in AS intake during the first interval and significant decrease in AS intake during the third interval ($P<0.01$). Mean (SD) BMI at baseline and each successive follow-up was 26.1 (3.9) kg/m², 27.4 (4.3) kg/m², 27.2 (4.4) kg/m² and 26.9 (4.7) kg/m², respectively. The change in BMIs for all three intervals was significant ($P<0.05$). There were no significant association between change in AS intake and BMI in the first interval ($\beta=-0.001$, $P=0.70$), and the second interval ($\beta=0.002$, $P=0.62$). A significant association was observed between changes in AS intakes and BMI in the third interval ($\beta=0.008$, $P=0.02$).

Conclusions: The patterns for increasing and decreasing mean consumption of AS and BMI followed a similar trend over time. However, only at older ages was the association significant. The clinical relevance of this finding warrants further investigation.

SO4.2. SHORT-ORAL: Active transportation

SO4.2.1

Safe Routes to School Legislation: What do underserved communities want decision makers to know?

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: Current research examining ways in which childhood obesity research evidence is used in policymaking process highlights several gaps, including engaging communities to have influence on policy decisions. This project seeks to bridge information gaps that exist between underserved communities, researchers, and policy makers/implementers to address health equity through a process of community engagement.

Methods: Safe Routes to School (SRTS) legislation was passed in Minnesota (USA) in 2014 providing significant funds for community grants. We identified three community groups (e.g., Somali, American Indian, and LGBTQ Two-Spirit) in the region experiencing weight/activity relevant health disparities and with traditionally underrepresented voices in the policy making process. Each community was empowered with evidence based SRTS practices and was tasked with hosting listening sessions within their respective communities. Community members were asked (1) What is happening in your community now related to SRTS and active transportation? (2) What are the main challenges to addressing these in your community? (3) What do you want to tell policymakers and implementers about how SRTS/active transportation relates to your community?

Results: Over 180 residents participated in the community listening sessions. Overall, residents expressed strong concerns about SRTS legislation and active transportation which varied by community, including sex trafficking/solicitation, second hand smoke exposure in public parks and residential facilities, exposure to predatory tobacco advertising soliciting children to smoke en route to school, physical/verbal fighting on school and city buses, lack of cultural competence and trust in transit and police authorities. Overall, recommendations fit broadly into 3 areas: infrastructure, crime and education/training. Brief community specific reports were developed and presented to various decision makers including state legislators and agencies (e.g., Dept. of Transportation) and local leaders (e.g., city council, school board, and law enforcement). Discussions and outcomes remain ongoing.

Conclusions: Legislation and implementation of policies like SRTS and active transportation that do not take into account the unique community and cultural assets and barriers of all communities will not only have limited success, they can inadvertently widen the already existing disparities in physical activity and obesity. More support for research, community, and policy maker engagement models is needed.

SO4.2.2

Street network and transport walking: Applications of space syntax

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: There is strong evidence showing that highly connected street networks are positively associated with walking, especially transport walking. Within walking and built environment research, the street network has been mainly operationalized using metric measures such as intersection density. However, space syntax concept provides alternate, relational measures of the street network that consider spatial relationships between streets. This paper has two aims: (a) to examine associations of both metric and relational measures of street network with transport walking; (b) to examine whether the relationship between integration measure of street network and transport walking is accounted for by availability of local destinations.

Methods: Data were collected in 2003-2004 from adult residents (n=2593) living in 154 Census Collection Districts (CCD) in Adelaide, Australia. Participants reported transport walking frequency in the past week. The availability of local destinations was calculated as the mean number of destination types (self-reported) available within a 10-minute walk. Intersection density (metric measure) and street integration (relational measure) were calculated for each CCD using geographic information systems (GIS) and space syntax software. Negative binomial regression was used to correct the over-dispersion in transport walking frequency.

Results: Higher intersection densities and street integration were positively associated with transport walking. Our study found that street integration, a space syntax measure, is distinct from intersection density that has been commonly used as a measure of street network. We also found that areas with high street integration were associated with residents' transport walking partly because of the availability of local destinations.

Conclusions: Our study found that street integration, a measure of space syntax, is a useful and distinct measure from intersection density. Our findings suggest that a space syntax measure of street network is spatial by definition but also accounts for a functional aspect (e.g. land uses) of urban forms. Using space syntax methods, it is possible to identify the most 'likely' locations in which commercial non-residential destinations will gather or should be located to be relationally closest to all residents. Adding a new perspective, space syntax concept has potential to advance research on the built environment and walking.

SO4.2.3

Benchmarking policy performance for active living: Developing and validating national transport liveability indicators

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

One method for improving chronic disease outcomes is to decrease use of private motor vehicles, and increase physical activity via adopting forms of active transport (walking and cycling) and public transport (incidental physical activity). Government policies relating to access and availability of transport infrastructure and services likely to contribute to modes of transport used. This study aims to develop and test policy-relevant, spatially-derived transport measures that are independently associated with selected chronic disease risk behaviours and health outcomes.

Methods:

A review of state-based transport policies across five Australian States and Territories was conducted. The review identified transport-related urban planning policies that could be developed into spatial built environment measures using a Geographic Information System (GIS). Spatial data available to populate these measures nationally were simultaneously identified. Australian urban planning policies related to walking, cycling, public transport, car access, street design and aesthetics were included. The proposed list of measures was circulated to policy-makers prior to finalisation.

Results:

The review found five spatial policy-relevant measures related to transportation including: street design (connectivity/layout, cul-de-sac, intersection spacing, block length and traffic volume), public transport (access and frequency), cycling (bicycle network, bicycle racks) walkability (block length, walking catchment) and private motor vehicles (road network and speed limits). Once developed, the measures will be tested using data from the How Areas in Brisbane Influence healTh and ActiviTy (HABITAT) study in Queensland Australia (~11,000 participants). Measures that are associated with health and health behaviour outcomes will be up-scaled and applied nationally to create a set of validated transport indicators.

Conclusions:

Government policy that facilitates the adoption of more active forms of transportation has potential to improve the health behaviours and chronic disease risk factors of its citizens. The development and validation of these spatial measures could allow for the creation of a national set of built environment indicators to spatially measure transport access and infrastructure across Australia. These can be used to bench mark policies and equitable access within and between cities, and to evaluate policy reform over time.

SO4.2.4

"Can we walk?" Environmental supports for active travel in India

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objectives:

Rapid rates of increase of obesity, diabetes, and associated non-communicable diseases (NCDs) (e.g., cardiovascular diseases, some cancers) are being documented in India, yet in-country research is lacking. Research from high-income countries suggests that environmental supports for physical activity (e.g., walking, bicycling, etc.) represent promising modifiable strategies to curb the rise in NCDs at a population level. This study is the first of its kind to conduct mixed-methods, interdisciplinary analysis of built environment impacts on physical activity in India. To address the inapplicability of existing measures, a first step of this study is to culturally adapt and test the reliability and validity of the Neighborhood Environment Walkability Scale (NEWS) in India.

Methods:

Qualitative data from field observations, structured participant and key informant interviews was collected in October 2013 in Chennai, India. All data was coded and thematically analyzed using NVivo software (QSR, 2012). Comments and quotations from narrative data were grouped by common themes. These were organized in a hierarchical order with a primary parent node containing multiple secondary child nodes; major themes (e.g., healthy and active living) formed parent nodes with sub-themes (e.g., walking, bicycling) as child nodes. Sections of visual data (photographs, maps) were also coded thematically and used to adapt NEWS for India. We are currently collecting quantitative data about the built, social environments and physical activity in Chennai using the adapted NEWS-India and the International Physical Activity Questionnaire.

Results:

Emerging themes from on-going fieldwork highlight the lack of pedestrian infrastructure to support walking, particularly among women and older adults. Local residents express the desire to engage in everyday physical activity, but attribute the inability to do so to non-existent sidewalks and high volumes of traffic. Residents recall engaging in leisure physical activity in local parks previously, but report being increasingly sedentary for leisure at present (watching TV, desk-bound jobs).

Conclusion:

The present study is being conducted in an understudied region and has the potential to add to the international literature on worldwide relevance of healthy environments. Findings have the potential to advance understanding of built environment factors that represent paramount priorities for urban planning across India.

SO5.2 SHORT-ORAL: Physical activity correlates in children

SO5.2.1

THE CORRELATES OF PHYSICAL ACTIVITY IN EARLY YEARS CHILDREN (AGED 0-6): A SYSTEMATIC REVIEW.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Introduction: Being physically active during the early years (0-6 years) is vital for the healthy development of children. Identifying factors associated with physical activity during the early years is crucial to guide effective interventions. The purpose of the systematic review was to synthesise findings from studies investigating potential correlates of physical activity in the early years and to assess the quality of those studies.

Methods: A systematic literature search was conducted in nine electronic databases. Each database was searched from the year of inception until September 2014. Included studies had to be: written in English, peer-reviewed, participants not in formal education, and a potential correlate must have been statistically assessed for its association with a quantitative measure of physical activity. The methodological quality of included studies was also assessed (STROBE checklist). Correlates assessed <4 times were graded inconclusive (?), and those assessed ≥4 times were graded: positive (+), negative (-), no association (O), or inconclusive (?). If >60% of high quality studies reported a consistent association or no association, correlates were coded ++, -- or OO. Correlates of total physical activity (TPA) and moderate-to-vigorous physical activity (MVPA) were reported based on a social-ecological model.

Results: Of 22045 identified studies, 131 were included. The most consistently reported correlates of TPA were sex (male,++) time spent outdoors (++), parental support (+), parental weight status (OO), parental work status (OO), attending preschool (OO), age (O), socio-economic status (O) and time of the day (afternoon,-). The most consistently reported correlates of MVPA were sex (male,++), age (O) and parent education (O). Ethnicity, age, gross motor-skills and sedentary behaviour(s) were tested frequently but reported associations were inconclusive (?). Nine studies (7%) were graded as high quality and 45 (34%) low quality.

Conclusion: Numerous published studies have investigated potential correlates of physical activity during the early years, but few were classified high quality. A small number of demographic, biological and social/cultural factors showed enough consistent evidence to support associations. Future studies need to be higher quality, explore new correlates (e.g. environment) and explore whether the found established correlates in this review are seen in alternative/sub-group populations.

SO5.2.2

Objectively Measured Physical Activity among Low-Income Toddlers: Correlates and Methodology

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SIG: Yes, Early care and education

Awards: No

Background: Toddlerhood is an important age for physical activity (PA) promotion to prevent obesity and support a physically active lifestyle throughout childhood. Due to the limited availability of objective and validated measures for toddlers that can be used in community studies, it is unclear which subgroups of toddlers are at the highest risk for inactivity. Using Actical ankle accelerometry, the objectives of this study are to develop valid thresholds and to examine reliability, validity, feasibility, and demographic/anthropometric correlates of moderate-vigorous PA (MVPA) among low-income toddlers.

Methods: Two studies were conducted with toddlers (12-36 months). *Laboratory Study* (n=24)-Two Actical accelerometers were placed on the ankle. PA was observed using the Child Activity Rating Scale (CARS, prescribed activities). Analyses included device equivalence reliability (correlation: activity counts of 2 Acticals), criterion-related validity (correlation: activity counts and CARS ratings), and sensitivity/specificity for newly generated thresholds. *Community Study* (n=277, low-income)- An Actical was worn on the ankle for >7 days (goal >5, 24-hour days). Height/weight was measured. Mothers reported demographics. Feasibility was examined using descriptive statistics. Correlates of MVPA were examined using bivariate (Spearman correlations/ t-tests) and multivariate (stepwise multiple linear regression, sMLR) analyses.

Results: *Laboratory Study*- Actical demonstrated reliability (r=0.980) and validity (r=0.75). Thresholds demonstrated sensitivity (86%)/specificity (88%). *Community Study*- 86% wore accelerometer, 69% had valid data (mean=5.2 days). Primary reasons for missing/invalid data were: refusal (14%) and wear-time ≤2 days (11%). The MVPA threshold (>2200 counts/minute) yielded 54 minutes/day. Bivariate analyses identified correlates of MVPA to include in sMLR (age, gender, recruitment location, race, and obese status), with additional variables not associated with MVPA (maternal age, marital status, education, and overweight/obese status, and household poverty and composition). In sMLR, MVPA (square root min/day) was associated with age (older>younger, b=2.8, p<0.001), gender (boys>girls, b=-0.8, p=0.026), and recruitment location (suburban>urban, b=1.2, p=0.002) or race (non-Black>Black, b=1.2, p=0.003); no association was observed with toddler obese status.

Conclusions: Ankle accelerometry is a valid, reliable, and feasible method of assessing PA in community studies of low-income toddlers. Sub-populations of toddlers may be at increased risk for inactivity, including toddlers that are younger, female, Black, and living in an urban location.

SO5.2.3

Predictors of physical activity in female youth: Longitudinal findings from the Children's Sport Participation and Physical Activity Study.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Trends in physical activity (PA) show a clear decline, particularly in females, with increasing age in adolescence. Community club sport (CCS), extra-curricular sport (ECS), active transport (AT) and physical education (PE) offer means of daily PA to this age group.

The purpose of the study was to assess the relative contribution of four modes of PA (CCS, ECS, AT and PE) to meeting the physical activity guidelines (PAGL) over key transition periods in female youth.

Methods: CSPPA Plus is a 5-year longitudinal study (n = 608; baseline age 10-18years) that includes three cohorts. Cohort 1: pre to mid-adolescence (n=149). Cohort 2: early to late adolescence (n=309). Cohort 3: late adolescence to young adulthood (n=150). Valid and reliable self-report surveys include data on frequency of participation in CCS, ECS, AT, PE, and days of meeting the PAGL.

Binary logistic regression models examined the relative contribution of the modes of PA at baseline to meeting the PAGL at that time, and using baseline modes of PA to predict meeting PAGL at follow-up, in all cohorts.

Results: Days of meeting the PAGL declined in all cohorts over the 5 year period. The proportion achieving 5+days PAGL declined from 40.1% at baseline to 18.2% at follow-up ($p \leq 0.01$).

The main predictor of PA was CCS. At baseline, the frequency of CCS (4+days per week) predicted meeting 5+days PAGL at baseline; overall ($\text{Exp}(B)=7.02$, CI 95%[3.91-12.60]), in cohort 2 ($\text{Exp}(B)=12.146$, CI 95%[5.46-27.00]) and in cohort 3 ($\text{Exp}(B)=5.118$, CI 95%[1.66-15.79]). Frequency of CCS (4+days per week) at baseline also predicted meeting 5+days PAGL at follow-up; overall ($\text{Exp}(B)=2.328$, CI 95%[1.18-4.59]), in cohort 1 ($\text{Exp}(B)=9.0$, CI 95%[1.03-79.03]) and in cohort 2 ($\text{Exp}(B)=2.755$, CI 95%[1.12-6.87]).

Conclusions: Involvement in CCS can impact on girl's current PA and have a lasting effect 5 years later on those still in school education. A lack of longitudinal findings in cohort 3 suggests a possible disconnect between activities offered during school years and young adulthood. CCS may be useful for the promotion of PA in adolescent girls, at a time where PA declines. Further research should investigate the changes that occur upon school leaving.

SO5.2.4

Who's Doing What in the Gym? Gender, Age and Weight Status Effects on Adolescents' Physical Activity during Physical Education Lessons

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The aim of this study was to examine individual differences in adolescents' physical activity (PA) levels during physical education (PE) lessons. PE lessons have the potential to make an important contribution to public health campaigns targeting adolescents' PA. Previous studies have described mean PA levels during PE lessons; however, there is little understanding of the effect individual differences, such as age, gender, and weight status, may have on the PA students accumulate during PE.

Methods: This study employed a cross-sectional, observational design. Grade 8 students (N = 1,177, M age = 12.93 years) from 73 PE classes in 14 schools in Sydney, Australia, reported their age and gender, had their height and weight measured, and wore an accelerometer during at least one PE lesson (M = 2.32 lessons per student). The proportions of lesson time spent in (a) moderate-to-vigorous PA (MVPA) and vigorous PA (VPA) were calculated. Linear mixed model analyses, accounting for class-level clustering (random effect), were used to examine the fixed effects of gender, age and BMI weight status on the PA variables.

Results: Overall, students engaged in MVPA for 17.2% of lesson time, including 8.7% of lesson time in VPA. Gender was the only variable associated with MVPA, as boys accumulated more MVPA than girls ($p < .001$). Further analysis, however, showed that all three individual difference variables were associated with VPA during lessons ($p < .05$). Boys and younger students achieved more VPA than girls and older students, respectively. Obese students spent a lower proportion of time in VPA than their underweight, normal weight, and overweight peers ($p < .001$).

Conclusions: Many students accumulate very little health enhancing PA during PE lessons. This issue appears particularly salient for girls, older students and obese students. Interventions designed to increase PA during PE lessons may require specific techniques to target these students who are less active than their peers during PE.

SO6.2. SHORT-ORAL:

Physical activity and sedentary behavior in older adults

SO6.2.1

I am too old to work out! Perceived age norms affect autonomous motivation to exercise

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: When older adults are aware of their age, their perception of age norms for physical exercise can affect their exercise motivation. Based on an integration of the Social Identity Approach and Self-Determination Theory, the aim of the present study was to investigate the effects of the salience of older age and of age norms for exercise on basic need satisfaction and autonomous motivation.

Methods: 120 older adults between 65-70 years old were invited to evaluate a (fictional) new exercise activity, labeled 'Pattern Stepping'. They were randomly assigned to one of four experimental conditions in which the salience of their age was manipulated together with the age norms for pattern stepping. Participants completed measures of basic needs satisfaction and different forms of motivation before and after performing pattern stepping.

Results: Repeated Measures ANOVAs revealed that basic need satisfaction was reduced when older age was made salient. By contrast, basic needs satisfaction increased when pattern stepping was presented to be normative for younger adults. In addition, autonomous motivation decreased when older age was salient and pattern stepping was presented to be age normative for older adults. By contrast, autonomous motivation increased when pattern stepping was presented as age normative for younger adults.

Conclusions: Considering that most participants did not identify themselves as an older adult (72.5%), the findings suggest that age norms for exercise should match the subjective (and not the objective) age of an older adult to benefit autonomous motivation. Identification potentially determines whether norms elicit autonomous or controlled motivation.

SO6.2.2

Older Adults and the Acceptability of Physical Activity: A Meta-Synthesis

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objectives: For older adults, being physically active can reduce the risk of chronic illnesses and frailty, and slow deterioration of cognitive function. Despite this, the number of older adults engaging in the levels of physical activity recommended by governments decreases dramatically as age increases. In order to develop and implement effective physical activity programmes for older adults, we need to ascertain which aspects of physical activity interventions are most acceptable to this population. Qualitative research has provided insights into this central issue of acceptability, but this research has not been systematically analysed to consolidate findings. The present research aims to systematically review and meta-synthesise this literature.

Methods: Studies that reported qualitative experiences of physical activity interventions in non-clinical populations where all participants were ≥65 years old and independently dwelling in the community were included. A systematic search identified 2612 papers, of which 14 met inclusion criteria. These were analysed using Thematic Synthesis, a meta-synthesis method with a rigorous three stage process: Line-by-line Coding; Descriptive Themes; and Analytical Themes.

Results: Intrinsic enjoyment of a physical activity as well as enjoying the social interaction possible from group interventions may be more of an incentive for older adults to engage in and maintain physical activity than reducing health risks. Promoting awareness of the tangible physical and psychological improvements experienced in daily life may also make physical activity more acceptable to older adults. A sense of personal safety is key to older adults being able to enjoy themselves whilst performing physical activity.

Conclusions: Intervention acceptability to older adults appears to result from activities being intrinsically enjoyable or producing valued short-term outcomes. Interventions which focus on the need for physical activity to improve health are likely to have limited success with older adults. Promotion should focus on physical activity as a fun, sociable pastime for older adults to enjoy to increase engagement. Helping older adults identify a physical activity that they would enjoy and having first-hand experience of novel physical activities with a trained professional would facilitate this.

SO6.2.3

Duration of bouts of physical activity and sedentary behaviour in relation to adiposity and insulin resistance: a cross-sectional study of community-dwelling older men.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Older adults have low levels of physical activity (PA) and high levels of sedentary behaviour (SB). We evaluated the independent associations between total amounts and bouts of different duration of moderate to vigorous physical activity (MVPA) and SB in relation to obesity, insulin resistance and metabolic syndrome.

Research Design and Methods: Cross-sectional study of community-dwelling men (71-91 years) recruited from 24 UK primary care centres, who wore an accelerometer had physical measures (height, weight, bioimpedance and resting blood pressure) and provided fasting blood samples which were analysed for lipids, insulin and glucose.

Results: 1528/3137 (49%) responded and returned an accelerometer with adequate data (≥ 3 days with ≥ 600 minutes/day wear time). 450 men with pre-existing chronic disease were excluded. 1029 men with full covariate and PA data were included in analyses. In linear regression models adjusted for wear time, season, region of residence, age, social class, living alone, smoking and alcohol consumption, each additional 30 minutes per day of SB (< 100 counts per minute, cpm) was associated with an adjusted BMI difference of 0.32 (0.23, 0.40) kg/m², whereas each 30 minutes of MVPA (> 1040 cpm) was associated with a much larger reduction in BMI; -0.72 (95%CI -0.93, -0.51) kg/m². Patterns for waist circumference (WC), fat mass index (FMI), and fasting insulin and metabolic syndrome were similar. Associations with bouts of SB and MVPA of different durations were investigated; men with most (top quartile) sedentary bouts/week lasting 60-120 minutes compared with the least (highest vs lowest quartile 11.7 vs ≤ 5 bouts), had higher BMI, WC, and FMI (1.43 kg/m², $p < 0.001$; 3.67 cm, $p < 0.01$; 0.70 kg/m², $p < 0.06$ respectively), adjusted for total SB and MVPA time. Men taking > 1.9 (median) weekly MVPA bouts lasting ≥ 10 minutes had lower BMI 0.71 kg/m², WC 1.94 cm and FMI -0.48 kg/m², all $p < 0.05$, than men taking ≤ 1.9 bouts/week (adjusted for total MVPA and SB time).

Conclusions: In community-dwelling older men, intensity of PA and patterns of accumulation of MVPA and SB were all independently associated with metabolic health. The finding that bouts of SB lasting ≥ 60 minutes are detrimental could help refine current SB guidelines, which currently suggest avoiding unspecified "long" periods of SB.

SO6.2.4

Multiple lifestyle behaviours and all-cause mortality in older adults: Evidence from a large population-based Australian cohort

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Background: Lifestyle risk behaviours are responsible for a large proportion of disease burden and many premature deaths worldwide. Risk behaviours, such as poor diet, physical inactivity, and excessive sitting tend to correlate and cluster with other risk factors within populations. An integrated multiple risk factor approach could delineate complex interactive effects of lifestyle behaviours on health.

Objective: In this study we examined the association between multiple lifestyle risk factors and all-cause mortality, using a newly developed lifestyle risk index (LRI).

Methods: We linked the baseline data of a large Australian cohort study ($n = 190464$, 2006-2008) to all-cause mortality registry data from Feb 2006 to Jun 2012. Smoking, excessive alcohol use, poor diet, physical inactivity, sedentary behaviour and sleep duration were measured by questionnaire. Lifestyle risk indices were created by summing individual risk factors and the c-index was used to select the LRI which had the best risk classification. Cox proportional hazards analysis was used adjusted for age, sex, educational attainment, marital status, country of birth and urban/rural residence. We tested effect modification by age, sex, educational status, and cardio-metabolic disease.

Results: During an average of 4.2 years of follow-up for 802976 person years, 7460 deaths were registered. Of all participants, 31.7%, 36.9% and 31.4% reported zero, one, and multiple lifestyle risk factors. There was a strong dose-response relationship between LRI score and all-cause mortality. Compared with those who reported zero risk factor, all-cause mortality hazard ratios (HRs) were 1.29 (95%CI: 1.21-1.38), 1.81 (1.69-1.94), 2.78 (2.57-3.01), 3.42 (3.05-3.85), 5.52 (4.39-6.93), and 7.13 (3.83-13.3) for those with an LRI score of 1-6 respectively. The association between LRI score and all-cause mortality was consistent across age groups, educational categories, and among those with and without cardio-metabolic disease. However, the association appeared stronger among women than men ($p < 0.001$). Among the common combinations of risk factors, insufficient physical activity and excessive sitting (HR=2.36) and insufficient physical activity and short/long sleep durations (HR=2.56) had the strongest associations with all-cause mortality.

Conclusions: Adherence to healthy lifestyles for smoking, alcohol use, diet, physical activity, sedentary behaviour, and sleep was associated with reduced risk for deaths from all causes.

SO7.2.1

Using traffic light labels to improve food selection in recreation and sport facility eating environments

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Many recreation and sports facilities have unhealthy food environments, however managers are reluctant to offer healthier foods because they perceive patrons will not purchase them. Preliminary evidence indicates that traffic light labeling (TLL) may increase purchase of healthy foods in away-from-home food retail settings, however very few studies have been conducted. We examined the effectiveness TLL of menus in promoting healthier food purchases by patrons of a recreation and sport facility concession, and among various sub-groups.

Methods: TLL of all menu items was implemented for a 1-week period and sales were assessed for 1-week pre- and 1-week post- implementation of TLL (n=2101 transactions). A subset of consumers completed a survey during the baseline (n=322) and intervention (n=313) periods. We assessed change in the proportion of patrons' purchases that were labeled with green, yellow and red lights from baseline to the TLL intervention, and association with demographic characteristics and other survey responses. Change in overall revenues was also assessed.

Results/findings: There was an overall increase in sales of green (52.2% to 55.5%; $p<0.05$) and a reduction in sales of red (30.4% to 27.2%; $p<0.05$) light items from baseline to the TLL period. During TLL, sales of green light main dishes increased by 21.8% ($p=0.01$) and sales of green light snacks and desserts increased by 14.1% ($p<0.01$) relative to baseline, while sales of red light main dishes decreased by 36.1% ($p<0.001$) and sales of red light snacks and desserts decreased by 30.1% ($p<0.001$) compared to baseline. Beverage sales did not change significantly during the study. The effectiveness of TLL did not differ according to any of the demographic or other factors examined in the survey. Daily revenues, the number of transactions, and dollars spent per transaction did not differ between the baseline and TLL periods

Conclusions: TLL of menus increased purchase of healthy, and reduced purchase of unhealthy foods in a publicly funded recreation and sport facility, with no loss of revenue. Policymakers should consider extending menu labeling laws to public buildings such as recreation and sports facilities to promote selection of healthier items.

SO7.2.2

What is healthy food? Objective nutrient profile scores and subjective lay evaluations in comparison

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Previous research on food hazards has shown that lay and expert perceptions sometimes diverge entirely. The goal of this study was to investigate consumers' health perceptions of various foods and relate these lay perceptions to objective nutrient profile scores.

Methods: Eighty-five adults served themselves meals from a fake food buffet (FFB) and evaluated the healthiness of the 54 presented foods and beverages. The FFB is a validated methodology for food choice research that is based on the usage of authentic food models. Nutrient contents of presented foods were used in regression analysis as predictors of consumer's healthiness ratings of the products. Further, consumer's healthiness evaluations were compared to objective UK Ofcom nutrient profile scores, which have been previously shown to have strong agreement with expert opinions.

Results: Lay evaluations and nutrition profile scores were highly correlated ($r=.83$, $P<.001$). This indicates that lay people judged the foods similarly to nutrition experts overall. Regression analysis further revealed that lay consumers based their judgments on fruit- ($\beta=.42$, $P<.05$), sugar- ($\beta=-.32$, $P<.05$), total fat- ($\beta=-.24$, $P<.05$) and fiber content ($\beta=.21$, $P<.05$) of the foods, but neglected the amount of saturated fat, protein and sodium.

Conclusions: Future interventions should focus on educating the consumer about the negative impact of diets high in sodium and saturated fat, while the positive aspects of nutrients such as protein should be emphasized.

SO7.2.3

When is an image a health claim? Data from a novel false-memory procedure.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Regulators continue to debate how health related imagery on product packaging might influence consumers' understanding. However, this debate relies on sparse empirical evidence that is largely derived from direct measures. Such measures only assess those inferences that consumers are aware of making and are willing to report. Conversely, indirect measures permit us to assess consumers' inferences without assuming their awareness of making those inferences. We know that people's inferences can shape what they remember, and that people often falsely remember seeing information that in reality they only expected to see. We therefore proposed a novel indirect, memory-based method to explore this issue.

Method: We conducted an experiment to assess the effects of images on people's understanding of products' health properties. This online study was completed by 372 volunteers from five European countries. Participants were shown a series of 12 fictional product packages each accompanied by one of three different types of written claims: either [1] an EU-approved health claim [2] a nutrition claim or [3] a generic claim. Some of the packages contained images that implied health-functions, such as an image of a brain, whereas some contained no function image. Participants subsequently completed a free recall memory task and recognition test.

Results: The data from this study showed that participants often misremembered written claims. However, the addition of function images to the packaging led to systematic memory biases, causing subjects to more regularly misremember nutrition claims as having been health claims. This result was replicated in the recognition test.

Conclusions: Our findings represent strong evidence in support of the standpoint that images can indeed act as health claims, insofar that they can lead people to implicitly infer health benefits that arise from consuming specific products. Moreover, they suggest that such inferences might often occur outside of consumers' conscious control, and thus could be highly pervasive. These findings underscore the importance of regulating the imagery on product packaging. We therefore propose that novel indirect methods such as ours represent innovative ways to measure the leading (or even misleading) capacity of specific images.

SO7.2.4

Stakeholders' positions on sugar-sweetened beverage taxation to prevent obesity: findings from a Canadian press review (2008-2013)

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: taxing sugar-sweetened beverages (SSB) to prevent obesity is controversial. Although it has been recently adopted in some countries, proposals have often been defeated. To contribute to inform decision-making in Canada, it appears worthwhile better documenting stakeholders' positions on the topic.

Methods: a comprehensive review of the Canadian press (2008-13) has been implemented to retrieve stakeholder positions. 1690 articles were identified via a combination of keywords (English & French languages) submitted in four databases (Eurêka, CPl.Q, CBCA, Repères). After removing off-topic contents, duplicates and foreigners' positions, 322 articles were selected. This step has been partly duplicated to increase reliability. From these articles, stakeholder positions (i.e. views expressed by an actor at a given time or occasion) have been extracted. The text related to each position has been coded in QDA miner @ software using typologies of stakeholders and arguments inspired from the literature.

Results: the extraction and coding processes enable to document 'who took a stance, how often and using which arguments'. A descriptive analysis is provided by date, province, stakeholder category (politician, expert, advocacy group, industry, media, etc.) to illustrate the use of pro and cons arguments related to the rational, potential efficiency, unintended effects, cost, equity, legal/technical feasibility and social/political acceptability of SSB taxation. Findings indicate that Québec is the province where SSB taxation has been most covered in the press between 2008 and 2013. A pro-taxation obesity-related advocacy coalition has played a critical role in prompting incremental press coverage during our study period. Health concerns linked to SSB consumption and aggressive marketing practices of the industry have been two recurrent arguments used by this coalition. The debate has been much polarized, with opposite reactions from industry spokespersons contesting the tax rational and effectiveness. However, few decision makers have made a stand on the issue.

Conclusion: over the last years in Canada, the debate on SSB taxation intensified in the province of Quebec, where advocacy groups have frequently exposed contradictory arguments. A formal stakeholders dialogue may contribute to raise political awareness and facilitate decision-making.

SO8.2.1

Trends in adult sedentary behaviour in 27 European countries - Is sitting time increasing?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Sedentary behaviour has emerged as a potential new chronic disease risk factor in public health. There is a widespread assumption that time spent in sedentary behaviours is increasing, but there has been limited population surveillance data to confirm or refute this notion. Eurobarometer is among the first cross-national serial studies to provide temporal trend estimates for adult sedentary behaviour. The aim of this study was to examine trends in sitting time across 27 European countries.

Methods: Data were from the Eurobarometer 58.2, 64.3, and 80.2 surveys, collected in 2002, 2005, and 2013 respectively. Sitting time data across all three time points were used to categorise respondents into 'low' (0 to 4h30mins), 'middle' (4h31 to 7h30mins), and 'high' levels of sitting (>7h30mins). We modelled the likelihood of being in the high sitting group within a given country and overall across the three time points. These models controlled for age group, education, gender, and reported physical activity.

Results: In total 17 countries/regions had valid sitting data for 2002, 2005 and 2013, and a further 10 countries/regions had valid data only over the latter two time points (2005, 2013). In the pooled sample of countries that had data at all three time points, the prevalence of 'high sitting' decreased steadily from 23.1% (95% CI = 22.2 - 24.1) in 2002 to 21.8% (95% CI = 20.8 - 22.8) in 2005, and 17.8% (95% CI = 16.9 - 18.7) in 2013. In the 10 countries with data only at the latter two time points, the prevalence of high sitting decreased from 27.7% (95% CI = 26.0 - 29.4) in 2005 to 19.0% (95% CI = 17.6 - 20.5) in 2013.

Conclusions: Although there is a widely accepted view that time spent in sedentary behaviours among adults is increasing, the results of this pan-European analysis suggest the opposite. This finding may have important implications for the sedentary behaviour debate and the policy response, and emphasises the importance and utility of monitoring trends in health-compromising behaviour over time.

SO8.2.2

Correlates of sedentary behaviour across 12 countries: The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE)

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: Many studies have examined sedentarism, including several that have used direct (i.e., accelerometer) measurement to assess total sedentary time (SED); however, most have been limited by small sample size, limited geographic area, and limited socio-cultural variability. ISCOLE represents the most up-to-date, directly-measured, harmonized information in this area. The aim of this study was to investigate correlates of total SED and self-reported screen time (ST) in 10 year-old children from 12 countries around the world.

Methods: ISCOLE study sites include: Australia, Brazil, Canada, China, Colombia, Finland, India, Kenya, Portugal, South Africa, the United Kingdom, and the United States. Child- and parent-reported household, socio-demographic, behavioural, and diet-related data were collected; directly-measured anthropometric and accelerometer data were also collected for each child. Participants with complete demographic, anthropometric, accelerometer, and ST data from ISCOLE were included in this analysis (n=6349, 45.8% boys). Twenty-two potential correlates of SED and ST were examined using multilevel linear models that controlled for age, sex, ethnicity and household income, and treated school and site as random effects. Variables associated with SED and/or ST in single-variable analyses (p<0.10) were included in the final models. Variables that remained significant in the final models (p<0.05) were considered independent correlates of SED and/or ST.

Results: Children averaged 8.6 hours of SED, and 60.8% of children did not meet screen time recommendations of ≤2 hours of ST per day. Computer in the bedroom (SED: p<0.0001; ST: p=0.0003), unhealthy diet score (SED and ST: p<0.0001), not meeting physical activity guidelines (SED: p=0.0006; ST: 0.0074), and <2 hours of after-school outdoor time (SED: p<0.0001; ST: 0.0126) were associated with higher SED and ST. Healthy diet score was associated with lower SED and ST (SED and ST: p<0.0001). Outdoor time before school, and on weekends, was inversely associated with ST (p<0.0001); having a TV in the bedroom was positively associated with ST (p<0.0001).

Conclusions: In this global sample many common correlates of SED and ST were identified, some of which are easily modifiable (e.g., computer in the bedroom). Future work should adapt this work to provide culturally meaningful public health messages.

SO8.2.3

Standing time and all-cause mortality in 221,240 adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Sitting time is detrimentally associated with a range of non-communicable diseases. Increasing standing time has been suggested as a way to reduce sitting time, but relatively little is known about the health benefits of standing. The present study aimed to determine the association between standing time and all-cause mortality.

Methods: Self-reported standing time from 221,240 individuals from the 45 and Up Study (Australia) were linked to mortality data from the New South Wales Registry of Deaths. Hazard ratios for all-cause mortality according to standing time at baseline were estimated using Cox regression modelling, adjusted for sex, age, education, urban/rural residence, physical activity, sitting time, body mass index, smoking status, self-rated health and disability.

Results: During 937,411 person years (mean follow-up=4.2 yr) 8009 deaths occurred. All-cause mortality hazard ratios were 0.90 (95% CI 0.85-0.95), 0.85 (95% CI 0.80-0.95), 0.76 (95% CI 0.69-0.95) for standing 2-≤5 hr/d, 5-8 hr/d, or >8 hr/d respectively, compared to standing two or less hours per day. Further analyses revealed no significant interactions between standing and sex ($p=0.93$), the presence/absence of cardiovascular disease or diabetes ($p=0.22$), BMI ($p=0.78$), physical activity ($p=0.16$) and sitting time ($p=0.22$).

Conclusions: This study showed a dose-response association between standing time and all-cause mortality in Australian adults aged 45 years and older. Increasing standing may hold promise for alleviating the health risks of prolonged sitting.

SO8.2.4

Changes in sedentary behaviours over the transition to retirement

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: When transitioning to retirement daily activity patterns need restructuring. However, if increased time is spent in sedentary behaviours, health may be affected due to the association between sedentary time and a number of chronic illnesses. Few studies have investigated this topic and, of those, most use a limited range of sedentary activities. Therefore this research investigated: "How do sedentary behaviours change across retirement?"

Methods: A longitudinal, observational study of activity patterns across the transition to retirement was undertaken between April 2012 and July 2014. Participants ($n = 140$) were aged 50 years or more, about to retire and living in Adelaide or Brisbane. A range of use of time measures were applied at pre-retirement and three, six and 12 months post-retirement, with 115 participants completing the final assessment. This paper describes self-reported use of time from the Multimedia Activity Recall for Children and Adults (MARCA). The MARCA is a computer assisted telephone interview which provides data on 24-hour activity type and duration. Fixed-effect regression modelling analysed changes in minutes per day spent in total and specific sedentary behaviours.

Results: Total time spent sitting significantly decreased ($p < .05$) from pre-retirement to the three post-retirement time points (mean decrease = 49.9 min/day). No significant changes occurred between the three post-retirement time points. Results for specific sedentary behaviours included a significant increase ($p < .05$) for time spent watching television (mean increase = 27.4 min/day) but a significant decrease ($p < .05$) in the time spent in passive transport (mean decrease = 11.8 min/day).

Conclusions: While overall sitting time decreased across retirement, specific types of sedentary behaviours showed mixed results. As studies are now indicating that different sedentary behaviours are associated with different health outcomes the information gained from this study will assist in accurately targeting interventions to reduce time spent in detrimental sedentary behaviours during retirement.

SO9.2.1

Multilevel interventions aimed at adult obesity prevention: enhancing and impeding factors across three countries

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Most countries in Europe invest in the promotion of healthy lifestyle behaviours to treat or prevent obesity. There is an increase in the adoption of multi-level interventions, aiming at both individual-level and environmental-level factors (coherent with socio-ecological frameworks). All sorts of barriers and facilitating factors determine whether a multilevel intervention approach will succeed or not. The aim of this study was to identify factors associated with successful Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) of multilevel interventions.

Methods:

We used public databanks and snowball sampling to identify three multi-level interventions targeting adult obesity prevention in Denmark, the UK and the Netherlands. Information was collected via questionnaires (based on the WHO Good Practice Appraisal Tool and the MacLellan-Wright community capacity tool) and in-depth interviews with professionals involved in the intervention. Interviews were conducted between October 2013 and January 2014 and were transcribed and analysed within each country. This was followed by a within- and between country thematic analysis of the success and failure factors of the three case studies.

Results/findings:

Based on 24 interviews conducted in Denmark (7), the Netherlands (8) and the UK (9) pre-identified themes (28) were confirmed and new themes (6) were identified. Proactive project management, close collaboration between involved parties and a bottom-up approach were identified as enhancing factors. A lower RE-AIM of interventions was perceived to be caused by a lack of i) resources, ii) target group participation, iii) needs assessment, and iv) shared vision and ownership. Those who where hardest to reach had other overwhelming issues to deal with. New themes included a flexible approach, underlying philosophy and use of language.

Conclusions:

Common themes in the different cases are that multilevel interventions require investments in a good alignment between all involved organizations. Finding common interests and creating a sense of urgency improves cooperation and increases likelihood of sustained impact of the intervention. The participation of the target group is crucial for further success of the intervention, and a tailored approach (appropriate language and activities) can enhance adoption.

SO9.2.2

Flow and cost of recruiting young adults into the TXT2BFiT weight gain prevention randomised controlled trial: from enquiry to randomisation

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Purpose:

Effective engagement of young adults into studies for prevention of weight gain is rarely researched, with limited reporting of recruitment procedures, success rates and costs involved. The aim of this research is to analyse the flow and associated costs from initial enquiry by participants to randomisation into the mobile-phone based program, TXT2BFiT, a randomised controlled trial aimed at encouraging healthy lifestyles and weight gain prevention among young adults.

Methods:

Participants were recruited either via letters of invitation from general practitioners (GP) or via advertisements in electronic or print media including university electronic newsletters, posters, mailbox drops and newspapers. Screening appointments were booked for participants recruited from participating GPs, whereas those recruited from other methods were sent an information pack to see their own GP. The total number and source of enquiries were categorised according to eligibility and subsequent completion of steps to enrolment and percentages calculated.

Results:

A total of 1181 people enquired. Of those, 10% were ineligible, and 30% did not enquire further. The remaining 714 were sent the screener survey with 119 people ineligible and 198 people not completing the screener survey. GP appointments were made for 137 people and GP information packs were sent to 260 people. Nearly half (43.5%) who were sent a GP information pack did not return the pack. Electronic media was the least expensive; however, Facebook cost \$945 per enrolment. The most expensive was print media at \$213 and GPs cost \$145 per enrolment. Over half of the participants resulted from recruitment strategies other than GP letters. A total of 250 participants were randomised costing \$139 per person.

Conclusions:

Almost one in three people enquiring about an m-health program did not progress past initial enquiry with further losses after electronic-based screening for eligibility. Recruitment via GPs, even when a free consultation was offered, appeared to be a barrier for enrolment. These findings have cost and time implications that must be considered when planning interventions. Procedural frameworks for recruitment protocols are suggested in association with systematic reporting of the success of recruitment strategies to build the evidence base.

SO9.2.3

“When I first started, I couldn’t get up those stairs without having breathing problems”: can a football-club based weight management model engage male prisoners in positive lifestyle change?

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: Professional football clubs can attract high risk groups to healthy lifestyle initiatives. The Football Fans in Training programme (FFIT) uses football to engage obese, Scottish men aged 35-65 from across the socio-economic spectrum in losing weight through improving their diet and becoming more active. The prevalence of inactivity, poor diet and overweight/obesity among male prisoners in the UK is ‘unacceptably high’. Adapting FFIT for prisoners aimed to capitalise on the known appeal of football to this disadvantaged and excluded population, and reflected national recommendations to use prison settings to promote physical activity, healthy eating and wellbeing.

Methods: A mixed methods feasibility and iterative programme redevelopment study, with observations of session deliveries (N=55), interviews (N=54) and focus groups (N=3) with prisoner participants and prison staff facilitators in three Scottish prisons, and before-and-after measures in two prisons, with follow up to 12 months.

Results/findings: The FFIT model succeeded in attracting prisoners: a total of 92 enrolled in 6 deliveries across the three prisons. Prisoners attended weekly programme sessions that included education on healthy eating and weight management and practical physical activity in the prison gym, and found ingenious ways of using a pedometer to fit physical activity into their highly-constrained daily routines “... you can walk up and down the hall. When we finish our work in here, I’ve got an hour so I spend an hour speed-walking round here five days a week.” The initial focus on weight was problematic for some, who reported many other benefits including improved fitness, wellbeing and sleep quality: “... it helped me at night ‘cause I was sleeping. At ten o’clock I was going to sleep”. The facilitators found it hard to keep some prisoners engaged during education activities. Redevelopment included changing the emphasis from weight to more holistic lifestyle improvement, and simplifying the education component. The high rate of transitions (between prisons, release) have made long term follow up challenging

Conclusions: The FFIT model demonstrates good potential to improve the lifestyles and wellbeing of a highly disadvantaged population. Full scale evaluation is now warranted, although obtaining long term outcomes may be unrealistic.

SO9.2.4

The Keeping the Body in Mind Program. Preventing antipsychotic-induced weight gain in first episode psychosis with lifestyle interventions

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Antipsychotic medication initiation in youth with first-episode psychosis induces rapid clinically significant weight gain and metabolic deterioration. This study evaluated the effectiveness of early lifestyle intervention initiated within four weeks of antipsychotic medication commencement, in attenuating weight gain.

Methods: A prospective intervention study in youth experiencing a first-episode psychosis consisting of a 12 week structured, individualised lifestyle coaching program delivered by specialist clinical staff (nurse, dietician and exercise physiologist). The intervention comprised of health coaching, dietetic education (including shopping and cooking), exercise prescriptions, with availability of an on-site gym. Participants were recruited from a community-based service between February 2013 and February 2014 (n=16). The control group (n=12) were recruited from another community-based service who underwent standard care. Primary outcomes were weight and waist circumference. Additional metabolic and cardiovascular measures (blood lipid profiles, blood pressure and fasting blood glucose) were obtained.

Results: The lifestyle intervention resulted in significantly less weight gain at 12 weeks compared to standard care (1.8 kgs 3.0 versus 7.8 kgs SD 4.7, p<0.001) and waist (0.1 cm SD 4.0 versus 7.1 cm SD 3.6, p<0.001). Intervention prevented deterioration in blood pressure, blood lipid profiles or fasting blood glucose, induced clinically significant improvements in aerobic fitness and reduced energy intake.

Conclusion: Lifestyle intervention attenuates antipsychotic-induced weight gain in youth with first episode psychosis. Including lifestyle intervention programs as part of routine care in youth with severe mental illness may reduce future disease risk and close the life expectancy gap for people living with serious mental illness.

SO1.3. SHORT-ORAL: Research methods in nutrition

SO1.3.1

Differential attrition in health behaviour change trials: a systematic review and meta-analysis

Rik Crutzen, Wolfgang Viechtbauer, Mark Spigt, Daniel Kotz
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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Attrition is a common problem in health behaviour change (HBC) trials focusing on, for example, increasing physical activity or improving dietary intake. When the degree of attrition differs between treatment conditions, then this is called differential attrition and is regarded as a major threat to internal validity. This increased risk of bias is due to bias-reducing measures (e.g., blinding) being difficult to implement in HBC trials. However, insight into the degree of differential attrition is limited. Therefore, the primary research question of this study was: How often and to what degree does differential attrition occur in HBC trials?

Methods: A systematic review and meta-analysis of a random selection of HBC trials ($k=60$). This is one of the rare cases where a meta-analysis can be said with confidence to provide a representative sample of studies because there is a clearly defined population of studies from which a random sample of studies was taken. We meta-analysed the relative attrition rates using a random-effects model and examined the relationship between the relative attrition rates and potential moderators: the amount of human contact in delivery and the intensity of the intervention/control condition, the type of control condition, and the follow-up intensity and duration.

Results: The average attrition rate was 18% ($SD=0.15$; median=0.15) in the intervention and 17% ($SD=0.13$; median=0.13) in the control conditions. The estimated average relative attrition rate was 1.10 (95%CI: 1.01-1.20, $p=.02$), suggesting an overall higher attrition rate of 10% in the intervention conditions. This relative attrition rate was not related to any of the potential moderators. There was no significant heterogeneity, which strengthens our confidence to draw general conclusions about the degree of differential attrition in HBC trials.

Conclusions: There is indication of a slightly higher amount of attrition on average in the intervention conditions of HBC trials. A non-random missingness mechanism that operates in the same way for both groups leads to bias. Future research should systematically study attrition at the individual level with methods that permit detecting biases that a trial-level analysis of studies cannot detect.

SO1.3.2

Dietary behavior: Developing a taxonomy of outcomes related to diet, eating and nutrition

Marijn Stok, Britta Renner, on behalf of WP 2.1 of the DEDIPAC project, and the DEDIPAC consortium.
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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

"Dietary behavior" is a multidisciplinary object of research. Intriguingly, "dietary behavior" is a fuzzy umbrella term that can mean and represent quite different things across disciplines and researchers, hampering communication and comparison across disciplines. When epidemiologists investigate eating behavior for example, they focus on different outcomes compared to public health researchers, and economists' view of dietary behavior outcomes again differs greatly from that of psychologists. In order to better understand the diversity and scale of dietary behavior research, the current study involved drawing up a taxonomy of the different outcomes studied by a diverse and broad group of scholars investigating dietary behavior.

Methods:

A four-step interactive Delphi method was employed. Input was provided by the 65 scholars involved in Work Package 2.1 (Determinants of Diet) of the DEDIPAC (Determinants of Diet and Physical Activity) project. In Step 1, an online mind mapping tool was employed to allow each partner to contribute their outcomes. In Step 2, these outcomes were combined, reduced and categorized into a compact taxonomy. In Step 3, this compact taxonomy was fed back to all scholars involved, discussed extensively, and adapted. In Step 4, the adapted taxonomy was finalized.

Results / Findings:

In Step 1, more than 100 dietary behavior outcomes were specified, at various levels of detail and with myriad relations being indicated between the different outcomes. In Step 2, these outcomes were structured and reduced to 21 outcomes at a comparable level of detail. Furthermore, they were categorized into 4 different main categories. In Step 3, discussions among the participants led to restructuring, re-categorizing and further reduction of the taxonomy. In Step 4, the final taxonomy was agreed upon, consisting of 3 main categories (Eating Behavior, Food Choice, and Dietary Intake/Nutrition) and 17 specific outcomes.

Conclusions:

The term "dietary behavior" covers a wide and diverse range of outcomes. Being aware of this diversity is a prerequisite to successful cross-disciplinary cooperation and, as such, important to the agenda of obesity research. The current taxonomy can be used as a tool to facilitate discussion and cooperation between different disciplines investigating dietary behavior.

SO1.3.3

Applying the Dietary Approach to Stop Hypertension (DASH) score to children: Is adherence to a kidDASH associated with childhood overweight or obesity?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Background: Diet quality is an important determinant of childhood obesity. However, no agreement on the best measure of diet quality exists. Diet pattern/whole-diet analysis is emerging in research investigating child, diet, disease associations. An a-priori approach, comparing children's adherence to a pre-defined healthy diet pattern, is one measure of diet quality and the Dietary Approach to Stop Hypertension (DASH) is a healthy diet pattern. The DASH diet plan has been successfully used in adult populations to assess diet-obesity relationships and is under-utilised in children. Therefore, the aim of the present research is to adapt the DASH score (kidDASH) for use in children to assess whether adherence to a DASH style diet is associated with a reduced risk of childhood overweight/obesity.

Methods: A cross-sectional survey of 1075 children aged 8-11 years from primary schools in Cork, Ireland. Measured Child height and weight were used to calculate BMI. Children completed a 3-day estimated food diary. The kidDASH score was developed by assigning foods to food groups that matched the DASH diet. Food weight in grams were used to divide each kidDASH component into quintiles. The quintiles were assigned a positive score of 1-5 for quintile 1-5, based on higher scores for higher consumption of healthy foods (e.g. fruit) and reverse scoring of 5-1 for quintiles 1-5, based lower scores for higher consumption of unhealthy foods (e.g. processed foods). Energy underreporting was identified using standard methods. Linear regression models, stratified by energy misreporting were used to explore the relationship between kidDASH and BMI.

Results: In fully adjusted models kidDASH was inversely associated with BMI plausible energy reporters $\beta = -0.04$ (95% CI -0.08 -0.01). Overweight/obese children had a higher per cent contribution to their overall mean daily energy intake from unhealthy kidDASH components compared to normal weight children ($p = 0.02$)

Conclusions: A DASH style diet in children was associated with a lower BMI. Public health strategies should promote healthy dietary patterns to help curb the current high level of childhood overweight and obesity.

SO1.3.4

Validation of a brief self-report index to assess DASH diet quality

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Hypertension is the most prevalent chronic condition in the US. Current guidelines suggest that individuals with hypertension should adopt a healthy, low-salt diet. In randomized control trials, the Dietary Approaches to Stop Hypertension (DASH) diet has been efficacious in reducing blood pressure. However in practice, adherence to the DASH diet is below what is needed to achieve meaningful reductions in blood pressure. Robust measures of diet quality require costly dietary recall interviews coupled with complex nutritional analysis to determine nutrient intake. The purpose of this study is to report on the development and validity of a population-based, self-report index of DASH diet quality, the DASH-Q.

Methods: Data were collected using an online survey from 2 separate samples: a national sample of adults using Amazon's MTURK system ($n = 407$) and working adults in a Southern US university ($n = 405$). Psychometric analyses were conducted using corrected item-total correlations and principal component analyses (PCA).

Results: Both samples were predominantly female, white and well-educated. PCA indicated a single dominant component which accounted for 32-40% of the variance depending upon the sample examined. The resulting 11 item tool assessed intake of healthy foods over the previous 7 day period; items were summed and scores ranged from 0-77. Internal consistency in both samples was good ($\alpha = .85$ in the national sample and $\alpha = .78$ in the university sample). Scores for the DASH-Q were correlated against another validated self-report diet instrument and criteria were established for diet quality. Further validation was determined by comparing scores against self-reported diet quality ($F = 37.95$, $p = .000$), number of days following a healthy eating plan ($F = 22.57$, $p = .000$), and frequency of reading nutrition labels ($F = 23.66$, $p = .000$). Less than 5% in each sample reported eating a high quality diet consistent with DASH guidelines.

Conclusions: The development of valid, self-report measures of nutritional quality are vital for advancing population-based research. Future studies will examine the relationship between the DASH-Q and systolic and diastolic blood pressure. We encourage researchers and practitioners working with individuals with hypertension to use the DASH-Q as an easy and valid measure of diet quality.

SO1.3.5

Five methods for assessing weight status change among elementary school children: Which one is right?

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Compare five methods for assessing change in weight status across 11 data collection points among elementary students: mean standardized body mass index (BMIz) by time, change in BMIz, average change in BMIz, Markov chain transition analysis, and group based trajectory modeling (GBTM).

Method: Participants included partial data on 7,866 students from a Southeast Texas Independent School District from 41 elementary schools in fall and spring from kindergarten to the beginning of 5th grade and complete data on 1,494 children. Heights and weights were measured by trained school nurses.

Results: Mean BMIz score revealed a general upward trend over time, with some seasonal variation. The change in mean BMIz score revealed distinct increases in BMIz in the summers and decreases during the school years. The change in BMIz score averaged over the 5 years permitted stronger tests of the summer-school year differences by demographic categories. Markov chain analysis revealed stability of students in groups (healthy weight, over-weight, and obese), and a small, but relentless, increase in the overweight and obesity groups over time, especially among boys, ethnic minority groups, the initially overweight, and lower SES groups. GBTM identified five developmental trajectories with different probabilities of overweight/obesity over time (persistently healthy weight: 49.6%; early-onset overweight/obese: 9.8%; late-onset overweight/obese: 10.4%; becoming healthy weight: 8.4%; and chronically overweight/obese: 21.9%).

Conclusions: Each approach provided different insights into the development of obesity. Analysis of mean BMIz scores emphasized the general upward trend implying a need to intervene early. The analysis of mean change in BMIz emphasized the seasonal differences in change with a previously unrecognized increase in BMI during the summer months with decreases during the school year. Markov Chain analysis revealed that children already obese when entering kindergarten were at very high risk of remaining obese, and are an important target for intensive early obesity treatment. The GBTM identified subgroups for intervention: post first and second grade summer months were critical for some children initiating developing into overweight/obesity and thereby identify candidate developmental stages for obesity prevention. Which analysis leads to the most effective times and locations for intervention remain to be seen.

SO1.3.6

SenseCam and the missing peach: exploring the use of digitally captured images to prompt dietary recall

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Many challenges are associated with the accurate assessment of diet behaviours and no 'gold standard' method exists. Dietary recall is a commonly used method but is prone to recall bias and misreporting. The use of image recording from wearable cameras to enhance validity and reliability of recall methods is an emerging area in public health research. We aimed to examine differences between dietary intake reported using a standard 24-hour recall interview and a 24-hour recall using digitally captured images as visual prompts.

Methods: Five adult volunteers wore SenseCam for 24 hours. The SenseCam is a camera worn around the neck using a lanyard which automatically takes photographs every 20-30 seconds. After the 24 hour period, a standard 24-hour dietary recall interview (24hr) was completed. After a break of at least thirty minutes, dietary intake was recalled for the same period while viewing the images collected by SenseCam (24hr+SC).

Results: We collected 120 hours of image data. A total of 143 food items were recalled using the 24hr method and a total of 158 food items were recalled using the 24hr+SC method. SenseCam images prompted the recall of 22 extra food items that were not reported using the 24hr method. Seven food items were reported using the 24hr recall but not identified using the 24hr+SC method. The majority of these items were from three main groups: fruit and vegetables; drinks; additional items (ketchup, gravy, salad dressing).

Conclusions: Our findings suggest that digital image capture is a promising method to improve dietary recall accuracy. These findings corroborate earlier findings from two different studies (Gemming *et al.*; O'Loughlin *et al.*) and also echo their limitations, particularly the small study time frame and the problems with low light situations. However, images can be successfully captured over a 24-hour period and used to prompt enhanced dietary recall, which may have significant utility in surveillance programmes, but further study is warranted to expand on these exploratory findings.

References

Gemming *et al.*, (2013) *Eur J Clin Nutr* 67 (10) 1095-99
O'Loughlin *et al.*, (2013) *Am J Prev Med* 44 (3) 297-301

SO1.3.7

Evaluation of food photography and computer imaging algorithms to identify foods in images and estimate food intake

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SIG: Yes, e- & mHealth

Awards: No

Purpose: The Remote Food Photography Method® (RFPM) and SmartIntake® smartphone app accurately measure the food intake of free-living adults. Participants capture images of their food selection and plate waste with the SmartIntake® app, which sends the images to a server for computer-assisted analysis that has relied historically on humans to estimate portion size. This project tested the ability of computer imaging algorithms to identify foods and estimate portion size.

Methods: Thirty-nine participants (62% white, 85% female) with mean±SD age 39.6±12.9 years and body mass index 31.5±5.2 kg/m² used the RFPM/SmartIntake® app during a laboratory-based meal. RFPM data were analyzed using computer imaging algorithms that: 1) identified foods in the images, 2) estimated portion size/food intake without human input, and 3) estimated portion size/food intake with human input using a semi-automated approach.

Results: The computer generates a rank-ordered list of foods during identification (the food that the computer believes is in the image is listed first, followed by the computer's second choice, etc.). This allows the operator to quickly select the correct food if it is not listed first, particularly if the correct food is near the top of this list (e.g., in the first 10 foods listed). The computer correctly identified 23.5% of foods, with 63.6% of foods appearing in the first 10 foods listed. The computer correctly identified more foods in the plate waste vs. food selection images, which is a function of the computer learning to better identify foods over time and limiting the number of possible foods in the plate waste image based on the food selection image. Compared to directly weighed food intake, the computer alone significantly underestimated food intake by 56±91 kcal (42.5%), $p<0.001$ (mean±SD). With human input using the semi-automated approach, the computer underestimated food intake by only 7±61 kcal (5.1%), $p=0.18$.

Conclusions: Computer algorithms cannot correctly identify all foods in images, though performance increases over time as the algorithms "learn". Computer algorithms inaccurately estimate portion size/food intake in the absence of a semi-automated approach that relies on a human operator to correct the computer algorithms' errors.

SO1.3.8

Exploratory Study of Correlates With the Healthfulness of Foods Parents Offer Their Preschool-Aged Children While Grocery Shopping, Measured Using Micro-Camcorders

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: To assess the relationship between the healthfulness of parental in-store food purchasing offers (FPOs) to their children and the healthfulness of their children's food purchasing requests (FPRs), and examine factors associated with the healthfulness of these parent FPOs.

Methods: Parent-child dyads were recruited at preschools in Central Texas and via an email mailing list. Dyads each completed one grocery-shopping trip at their usual store and time. The trip was recorded using a child-worn micro-camcorder attached to a hat. Videos were coded for behavioral factors such as parent FPOs and child FPRs. After the shopping trip, parents completed a questionnaire assessing factors including education, race, self-reported height and weight, parent diet, perception of healthful food cost relative to unhealthful food cost, use of nutrition facts labels, income, family size, family fast-food frequency, and child age and sex. For this study, "healthy" foods were considered to be fruits and vegetables, while "unhealthy" foods were sugar-sweetened beverages and snack foods.

Results: Dyads ($n=38$) consisted of Caucasian parents (76%), mothers (92%), with 26% of families income-eligible for WIC, children aged 3.7 ± 1.1 years, and 21 boys and 17 girls. Parents made 210 total FPOs (5.5 ± 3.7 per trip) with 130 (62%) being either "healthy" ($46\pm31\%$ of FPOs on average) or "unhealthy" ($18\pm24\%$). Parents of boys had higher "healthy" FPO percentages than parents of girls ($55\pm27\%$ vs. $34\pm31\%$; $P=0.026$). "Unhealthy" parent FPO percentage was significantly correlated with "unhealthy" child FPR percentage ($\rho=0.349$, $P<0.05$). For "healthy" child FPR percentage, though not statistically significant, the association with "healthy" parent FPO percentage was in the expected direction. Other factors examined in this study were not statistically significantly associated with the healthfulness of parent FPOs.

Conclusions: The healthfulness of parents' FPOs is reflected in the healthfulness of their children's FPRs, suggesting modeling effects, and parents offered more healthful food to boys than girls. These results demonstrate the important role parent in-store food modeling plays in shaping child food preferences, and shows parents may behave differently depending on child sex. Though more research is needed, these results can be used to help guide future family-based interventions targeting grocery-shopping healthfulness.

SO1.4. SHORT-ORAL: Nutrition and social and built environment

SO1.4.1

Examining the Influence of Acculturation on the Perceived Risk and Protective Factors for Childhood Obesity among Southeast Asian Communities

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SIG: Yes, Children and families

Awards: No

Purpose: Refugee status and level of acculturation may negatively influence health behaviors among individuals in the United States. Southeast Asian (SEA) refugee children (i.e. Hmong, Laotian and Cambodian) have higher rates of obesity than other Asian subgroups and racial groups. As SEA acculturate to American lifestyles, they may adopt obesogenic Western diets and physical inactivity patterns and consume fewer traditional foods. Despite these risks, research on childhood obesity and acculturation among SEA refugee populations is limited. This study explores whether the perceptions of risk and protective factors for childhood obesity among SEA parents and grandparents differs by level of acculturation.

Methods: We used a community-engaged mixed methods research design that involved collecting and analyzing qualitative and quantitative data using concept mapping methodology. Fifty-nine participants completed surveys and concept mapping which included: nominal group meetings to elicit statements related to weight status and structuring meetings where participants sorted and rated statements based on similarity and relative importance. To examine level of acculturation (high/low), we used the SEA Acculturation scale. Concept Systems® Software generated clusters of ideas, cluster ratings, pattern matches and t-tests of significant differences in cluster ratings by acculturation group.

Results: Cluster analysis yielded eleven clusters related to risk/protective factors. Participants in the low acculturation group rated "Healthy food changes made within school," cluster as the most important (average rating 3.59) whereas participants in the high acculturation group rated "Children's psychosocial health and sedentary behaviors" cluster as the most important (average rating 3.65). The pattern match demonstrated low correlation ($r = 0.29$) in average cluster ratings between high/low acculturation groups. Of the eleven clusters, four cluster ratings significantly differed between high/low acculturation groups. When we examined statement importance separately for each group, participants in the low acculturation group rated more SEA cultural statements as most important.

Conclusion: The findings indicate that level of acculturation is associated with differences in the average perceived importance of risk and protective factors for childhood obesity. Knowing these key differences as well as identifying important themes for both high/low acculturation groups will be essential for any childhood obesity interventions developed for SEA refugees.

SO1.4.2

Shaping the school environment to promote healthy diet and lifestyle habits

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SIG: Yes, Policies and environments

Awards: No

Objective: Child health is a vital public health concern. Schools are a protected environment where children, their families and school staff including caterers can be reached with key messages about healthy diets and lifestyles. Accordingly, school-based interventions aim to specifically improve children's behaviour e.g. as concerns fruit & vegetable intake, water consumption, or physical activity. School food policies can help set the scene, but proper monitoring and evaluation is needed to assess their impact. The JRC is interested in understanding success factors that can help optimise the school environment and related policies for promoting healthier behaviours.

Methods: As a first step, we have mapped school food policies in the European Union (EU) and described them thoroughly and systematically. Moreover, we brought together experts to discuss national school food policies across Europe, identifying best practices and the potential to explore the policies or the schools further.

Results: The mapping revealed that all 30 countries considered have a school food policy in place; half of them being voluntary and the other half mandatory. Standards and guidelines provided commonly offer food-based instructions, but they also consider the dining environment, vending services, catering practices, and staff training among others. Crucial success factors were the building of partnerships, local engagement (focus on head teachers), and increasing the availability of healthier options. At the same time, further work is needed on ways to communicate better between all stakeholders, improve the image of school food, and target resources effectively. Knowledge gaps include the influence of diet on school attainment and the role of portion sizes for energy intake and weight management.

Conclusions: We will be assessing concrete school based interventions to indeed support European policymakers in their efforts to further improve the school environment and thus promote healthy behaviours in children and beyond, in line with the EU Action Plan on Childhood Obesity 2014-2020.

SO1.4.3

Food Insecurity and Adolescent Personal Health, Home and Academic Environments

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: The impact of food insecurity on rural adolescents is not widely known and literature is limited. Using data from project BreakFAST, this study aimed to identify personal health, home environment and school environment characteristics unique to rural adolescents experiencing food insecurity.

Methods: This cross-sectional analysis was conducted using baseline data from a group randomized trial aimed at increasing school breakfast participation through policy and environmental-level school changes. Students (N=758) completed an online survey asking about demographics, food security, health, physical activity, home and school environments. Other data sources included school provided data and objectively measured height and weight. Food security was assessed using a 9-item Child Food Security Survey Module, validated for adolescent self-report. Bivariate analysis (Chi-square tests and two-sample t tests) and adjusted and unadjusted linear regression, accounting for clustering by school, was performed using Statistical Analysis Software (version 9.3, SAS Institute Inc., Cary, NC).

Results: Of the total sample, 81% reported sleeping only 5-8 hours each night, less than the recommended hours of sleep for their age group (9 or more hours). Compared to food secure adolescents, food insecure adolescents were more likely to be female (64% vs. 53%, $p=.03$) non-white (42% vs. 29%, $p=.006$) and participate in the government supported meal program, a proxy for low SES (54% vs. 32%, $p<.0001$). Compared to their food secure counterparts, food insecure adolescents were less likely to report excellent or very good health ($p<.0001$) or participate in strenuous exercise more than ½ hour a week ($p<.0001$). At home, food insecure adolescents were less likely to eat dinner as a family ($p=.03$). At school, food insecure adolescents were more likely to fall in a lower GPA percentile (36th) than their food secure counterparts (47th) ($p<.0001$) and less likely to participate in school sports teams ($p<.0001$).

Conclusions: Food insecure students experience a range of less desirable outcomes when it comes to personal health, home and academic settings. Intervention models that address all three of these categories are needed when aiming to reduce the negative impacts of food insecurity on adolescents.

SO1.4.4

Does the built environment influence your BMI? Using kernel density estimation to understand the influence of destinations on overweight and obesity

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose:

This study sought to examine the relationship between the distribution of destinations (such as shops and service facilities) in local areas, and body mass index (BMI). Using kernel density estimation we investigated whether living in areas of greater destination intensity is associated with lower BMI scores (compared to living in areas with more dispersed destinations), and if so, whether levels of walking and physical activity explain these associations.

Methods:

The sample consisted of 2349 residents of 50 urban areas in metropolitan Melbourne, Australia. Destinations within these areas were geocoded and kernel density estimates of destination intensity were created using kernels of 400m (meters), 800m and 1200m. Using multilevel linear regression, the association between destination intensity (classified in quintiles Q1(least) - Q5(most)) and BMI was estimated in models that were adjusted for potential confounders. Separate models included a walking variable (4/ times a week or more compared to 3/times a week or less) and a physical activity variable (insufficiently active compared to sufficiently active).

Results/findings:

For kernels of 1200m, there was an inverse relationship between BMI and living in areas of more intensely distributed destinations (compared to areas with least destination intensity) (Q4, β -0.89, 95%CI -1.64, -0.14; Q5, β -1.03 95%CI -1.65, -0.41). These effects were attenuated, but remained significant when walking was included in the models (Q4, β -0.81, 95%CI -1.56, -0.05; Q5, β -0.93 95%CI -1.56, -0.30). Significant effects disappeared with the inclusion of physical activity in the models.

Conclusions:

This study found that those respondents living in areas of greater destination intensity had lower BMI values. Effects were only slightly reduced with the inclusion of walking variable, indicating that the effects of destination intensity on BMI may be only slightly explained by increased levels of walking. However effects disappeared with the inclusion of physical activity in models. The results suggest that increasing the intensity of destinations could reduce BMI levels by increasing opportunities for physical activity.

SO1.4.5

Life, physical activity and health in post-Olympic East London: qualitative findings from The ORIEL Study

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objectives:

Sporting mega-events, such as the London 2012 Olympic and Paralympic Games, are framed as unique opportunities to 'inspire a generation'. Although these events are described as having an impact on population physical activity levels there is little evidence to support this and even less understanding of how an 'inspiration effect' might operate. This qualitative study examined the experiences of East London residents after the Games and sought to investigate whether and how the event impacted upon daily life and routine health behaviours.

Methods:

A longitudinal ethnographic study included two waves of post-Olympic data collection (2012 and 2013). Narrative family interviews, go-along interviews and video focus group workshops were conducted with 66 Olympic borough residents at wave one and 40 at wave two. Interviews were transcribed and subject to a narrative analysis which identified and compared accounts of health and wellbeing in terms of the event and associated neighbourhood change. The analysis explored how people constructed causal accounts and drew upon shared meanings in relation to health-related life choices.

Results:

The Olympics was intended to both rejuvenate the area and encourage the wider adoption of physical activity. At wave one, spectacle and celebration were dominant narratives. Participants reported being highly engaged with the event, even if initially cynical, and many were keen to talk about particular sporting events and athletes. However, reports of being 'inspired' to engage in sports and physical activity and other health promoting behaviours were largely absent at both waves. Stories of insecurity, housing problems and safety concerns were much more pervasive than those of health or physical activity.

Conclusions:

The local environments in which people live, and their perceptions of them, are important determinants of health. In the context of prevailing neighbourhood deprivation, aiming to improve physical activity behaviours through sporting mega-events can be somewhat superficial. Participants had more immediate concerns that were chiefly related to everyday the social determinants of health. Sustainable behaviour change through sporting mega-event demonstration effects are unlikely unless more pressing and immediate needs are met first.

SO1.4.6

Healthy Liveable Communities: Bridging gaps between evidence, policy and practice

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SIG: Yes, Policies and environments

Awards: No

Purpose: Growing evidence suggests that creating 'liveable', pedestrian-friendly communities may reduce non-communicable diseases and health inequity by encouraging active living. However, translating health-related evidence to those sectors responsible for creating the built environments (planning, transportation) is challenging. A new NHMRC Centre of Research Excellence (CRE) in Healthy Liveable Communities has been established to create and disseminate evidence, aligned with planning and transport policy and practice. The CRE aims to generate and exchange data, knowledge and information across five themes: 1) measurement of policy-relevant built environment (BE) features associated with leading chronic disease risk factors (physical activity, obesity), health outcomes (CVD, diabetes) and mental health; 2) causal relationships for BE interventions using data from longitudinal studies and natural experiments; 3) 'thresholds' for BE interventions; 4) economic benefits of BE interventions designed to influence health and wellbeing outcomes; and 5) factors, tools, and interventions that facilitate the translation of research into policy and practice.

Method: Our multi-disciplinary team covering seven disciplines, will work with multi-sector national and state (WA, Qld, Vic) Advisory Groups (AGs) comprised of government, industry and NGOs. To ensure policy-relevance and facilitate research translation, the AGs will provide advice and input into new and ongoing research; advise on knowledge translation plus facilitate and advocate for research uptake. A data management platform and translation tools will be developed to support communication and exchange of data.

Results: Following a national CRE launch in March 2014, AGs have been established and have met regularly throughout the year to have input into the CRE Team's work programs and to hear about findings to date. Interdisciplinary teams are working to the work program established for each theme.

Conclusions: A major focus of this CRE is to undertake policy relevant research that can be translated into policy and practice. This requires our team to build relationships with, and work closely with policy-makers and advocates. This presents opportunities and challenges, both of which will be discussed in this presentation.

Acknowledgements: Other investigators on the team include Pettit C, Knuiaman M, Badland H, Hooper P, Gunn L, Rochelle J.

SO1.4.7

Preliminary outcomes of Live Well-Viva Bien - a multilevel intervention in low income housing sites to increase fruit and vegetable consumption

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SIG: Yes, Policies and environments

Awards: No

Purpose: Eating more fruits and vegetables (F&V) is associated with a lower risk for many chronic diseases. However, most Americans, especially low-income, racial/ethnic minorities, do not eat recommended amounts. The purpose of 'Live Well, Viva Bien' is to evaluate whether Fresh to You (FTY), an innovative public-private partnership program that brings nutrition education programming in conjunction with year-round, discount, mobile, fresh F&V markets to subsidized low income housing complexes, is effective at increasing F&V intake among housing complex residents.

Methods: A total of fifteen (15) subsidized housing complexes (one pilot site and eight demographically-matched pairs of sites) were recruited into the study. Project staff with the help of resident assistants from the housing complexes recruited residents to participate in the study cohort. After the baseline surveys were completed, housing sites were randomized to intervention or comparison conditions. The interventions lasted for 12 months. Intervention sites received the FTY F&V markets twice per month at each site as well as two F&V campaigns, monthly newsletters, and a DVD. Comparison sites received physical activity and stress programming delivered by the YMCA. Follow-up surveys were conducted at 6 and 12 months. F&V intake was measured at baseline and follow-up using the NCI F&V screener. Process evaluation was conducted to measure market sales, profits and participation.

Results: Participants (n= 1598) were 73% female, 54% Hispanic; 17% black; 50% born outside the US; 5% employed full-time; 68% had household income < \$12K per year. F&V prices averaged 20% below supermarket prices. Most popular items included bananas, mangoes, grapes, tomatoes, broccoli, asparagus and tomatoes. Preliminary data from 13 sites demonstrates that F&V intake increased from baseline to 12 months in the intervention group by 0.63 cups while control group F&V intake decreased by 0.11 cups, p< 0.0001. The final presentation will include F&V change data from all 15 sites as well as data on changes in mediators.

Conclusions: The FTY program was successful in increasing F&V intake of low income participants. We will also discuss implementation challenges, lessons learned, and plans for the future.

SO1.4.8

Citizen engagement and empowerment for creating healthy community environments

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

The implementation of a comprehensive package of strong policies at the national level to reduce childhood obesity typically takes time and is particularly difficult when the political climate for it is not optimal. To date, the pressure for action to reduce obesity has been predominantly health professional driven, not grass-roots, and this is part of the reason that there has been little policy action. While most of the public are highly supportive of various policies to improve the healthiness of their food and physical activity environments, as shown in multiple studies, it is a quiet support, and strategies, tools and processes are needed to effectively convert that support into vocal demands for increased and stronger actions to reduce obesity.

Methods

Through a formative evaluation process in a range of local New Zealand communities, approaches to engage and empower citizens for creating healthy community environments are being developed. A smartphone application is being developed to crowd source data on nutritional quality of foods in schools and workplaces, outdoor food advertising, food advertising through sport club sponsorships and events, food retail, and local physical activity environments and to provide immediate, tailored feedback about the healthiness of food and activity environments to citizens, Councils, local Members of Parliament, schools, retailers and sport clubs.

Results

These data will allow the local communities, schools and retailers to be benchmarked against each other according to the healthiness of their food and activity environment. This approach aims to support public awareness and improved actions at the local level to reduce childhood obesity. In addition, the data will be used for sustainable monitoring of the healthiness of food and activity environments in New Zealand.

Conclusions

Approaches to engaging and empowering citizens to improve the healthiness of their community environments through crowdsourcing data on these environments and tailored feedback loops to all local stakeholders might show potential for reducing childhood obesity, at times when implementation of strong national policies proves to be challenging and slow. Ultimately, public pressure, in addition to the current pressure of health professionals, might accelerate the implementation of strong policies to reduce childhood obesity.

SO2.4. SHORT-ORAL: Physical activity and the built environment

SO2.4.1

International variation in neighborhood walkability, transit, and recreation environments using Geographic Information Systems: The IPEN Adult study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: The World Health Organization recommends strategies to improve urban design, public transportation, and recreation facilities to facilitate physical activity for non-communicable disease prevention for an increasingly urbanized global population. Most evidence supporting environmental associations with physical activity comes from single countries or regions with limited variation in urban form. This presentation documents variation in comparable built environment features across countries from diverse regions.

Methods: The International Physical Activity and the Environment Network (IPEN) study of adults aimed to measure the full range of variation in the built environment using geographic information systems (GIS) across 12 countries on 5 continents. Investigators in Australia, Belgium, Brazil, Colombia, the Czech Republic, Denmark, China, Mexico, New Zealand, Spain, the United Kingdom, and the United States followed a common research protocol to develop internationally comparable measures. Using detailed instructions, GIS-based measures included features such as walkability (i.e., residential density, street connectivity, mix of land uses), and access to public transit, parks, and private recreation facilities around each participant's residential address using 1-km and 500-m street network buffers.

Results: Eleven of 12 countries and 15 cities had objective GIS data on built environment features. We observed a 38-fold difference in median residential densities, a 5-fold difference in median intersection densities and an 18-fold difference in median park densities. Hong Kong had the highest and North Shore, New Zealand had the lowest median walkability index values, representing a difference of 9 standard deviations in GIS-measured walkability.

Conclusions: Results show that comparable measures can be created across a range of cultural settings revealing profound global differences in urban form relevant to physical activity. These measures allow cities to be ranked more precisely than previously possible. The highly variable measures of urban form will be used to explain individuals' physical activity, sedentary behaviors, body mass index, and other health outcomes on an international basis. Present measures provide the ability to estimate dose-response relationships from projected changes to the built environment that would otherwise be impossible.

SO2.4.2

Does the Built Environment Influence Saudis' Physical Activity?

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SIG: Yes, Policies and environments

Awards: No

Introduction and Objective: Youth who participate in regular physical activity (PA) obtain health benefits. Previous literature representing insufficient levels of PA among Saudi youth have been established. However, to date, the influence of the built environment on physical activity among youth in Saudi Arabia is unexplored. Moreover, this is particularly the case with regard to studying differences between diverse Saudi communities, from contrasting socioeconomic and geographical environments. This study was designed to examine the association between the perceived neighbourhood environment and physical activity among Saudi youth using subjective and objective methods.

Methods: A total of 452 youth (15-19 years) from different geographical locations (i.e., urban, rural farm, and rural desert "Bedouin") agreed to participate in this study. They wore pedometers to assess physical activity and completed two self-report questionnaires (IPAQ-s and IPAQ-e). Body mass index and waist circumference measurements were recorded, and weight status was classified according to International Obesity Task Force criteria.

Results: Significant differences in the PA levels and weight status of youth were evident with regard to gender and geographical area. Active youth were significantly more likely ($P < 0.05$) to cite access of recreational and sports facilities, sidewalks and aesthetics, as reasons for being active, compared to less active youth. Logistic regression analysis showed that Youth who perceived unsafe neighbourhood were 13% more likely to be overweight or obese ($OR = 1.127$, 95% $CI = 1.003-1.266$) and were 33% more likely to be inactive ($OR = 0.675$, 95% $CI = 0.548-0.832$). Youth who live in social environment with many people being physically active were 48% more likely to be active ($OR = 1.483$, 95% $CI = 1.131-1.944$). The availability and quality of places for walking and bicycling in the neighbourhood increase the possibility of being active by 49% ($OR = 1.493$, 95% $CI = 1.065-2.094$).

Conclusions: The findings identified strong associations between some environmental factors with PA levels. Moreover, these findings provide policy makers and urban planners with further evidence that certain features of the built environment may be important in the design of neighbourhoods, to increase sport and recreational facilities and meet the health needs of residents.

SO2.4.3

Neighborhood walkability and health outcomes among older adults: mediating effects of physical activity

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Background: Older adults living in high compared to low walkable neighborhoods have been shown to be more physically active. However, it is inconclusive whether they also exhibit better health outcomes and whether this is explained by their higher physical activity levels. The current study examined the relationships of walkability with older adults' BMI, waist circumference, physical and mental health-related quality of life and functional performance. Additionally, the mediating role of transportation walking and MVPA in these relationships was studied. Finally, we studied the moderating effect of neighborhood income on the relationships between walkability and health outcomes and on the mediation analyses.

Methods: We recruited 508 Belgian older participants in 20 neighborhoods stratified by objectively measured walkability and income. Walking for transport and physical and mental health-related quality of life were self-reported. MVPA, BMI, waist circumference and functional performance were measured objectively.

Results: In low income neighborhoods, participants of high walkable neighborhoods had a lower BMI ($B = -1.5$, $SE = 0.6$, $p < 0.05$) and a smaller waist circumference ($B = -7.9$, $SE = 2.5$, $p < 0.001$) than those living in low walkable neighborhoods. This was partially explained by higher levels of walking for transport and MVPA in high walkable neighborhoods (% mediated ranged from 8.8 to 19.0). In high income neighborhoods, no differences in BMI and waist circumference between high and low walkable neighborhoods were found. Walking for transport inconsistently mediated the relationships of walkability with BMI and waist circumference in high income neighborhoods. Physical and mental health-related quality of life and functional performance did not differ between high and low walkable neighborhoods. However, inconsistent mediations were observed through MVPA and walking for transport.

Conclusions: It is a promising finding that high walkability relates to better health through higher levels of physical activity in low income neighborhoods. The observed inconsistent mediations imply that living in a high walkable neighborhood is beneficial for older adults' health through increased PA, but that other (unobserved) mediators might offset this beneficial effects. Future research on these mechanisms is necessary to inform policy and planning on how to design walkable neighborhoods that optimally promote health.

SO2.4.4

Social and physical environmental factors influencing adolescents' physical activity in urban public open spaces: a qualitative study using walk-along interviews

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

Since sport club membership declines in transition to adolescence, public open spaces (POS) might provide a good alternative to stimulate physical activity (PA) among this age group. Most studies examining PA at POS focus solely on the physical environment. However, according to socio-ecological models the social environment is important as well. The aim of this study was to determine which social and physical environmental factors influence adolescents' leisure time PA in POS in low-income neighborhoods. Since current knowledge on this topic is limited, especially in Europe, a qualitative approach was used to obtain detailed and context-specific information.

Methods:

Participants ($n=30$, aged 12-16 years, 67% boys) were recruited in POS in low-income neighborhoods in Brussels, Ghent and Antwerp in Belgium. Participants were interviewed while walking in the POS with the interviewer. The on-site walk along interviews took place in the POS where the adolescents were present and were continued in a second POS that was not used by the participants. Using this method the interviewer could observe and ask questions while the participant is actually experiencing the environment. Photographs of the discussed environmental characteristics were taken to illustrate our findings. All audio-recorded interviews were transcribed and analyzed using Nvivo 10 software and thematic analysis was used to derive categories and subcategories using a grounded theory approach.

Results:

The most important subcategories that were supportive for PA were accessibility by foot/bicycle/public transport, located close to home or school, presence of friends, upkeep of the POS and features, availability of sport and play facilities, large open spaces, presence of other people who are active and organized activities. The most important subcategories that were unsupportive for PA were presence of undesirable users (drug users, gangs, homeless people), traffic, secluded areas, presence of pubs or restaurants with terraces and bad upkeep of features.

Conclusion:

Our findings revealed a range of factors across all levels of the ecological model influencing adolescents' PA in POS. Easy accessible POS with features of high quality in the close neighborhood of adolescents' home or school might stimulate PA if they also experience a safe and familiar social environment.

SO2.4.5

Assessing the impact of the 'Liveable Neighbourhoods' planning policy on residents physical activity, health and well-being outcomes: A systematic review of results from the RESIDential Environments (RESIDE) project in Perth, Western Australia

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

Twenty-thirteen marked the fifteenth anniversary of the introduction of the 'Liveable Neighbourhoods' (LN) planning policy in Perth, Western Australia and the start of a review of the policy by the Department of Planning. As such there was considerable interest in the results of the RESIDE project that had commenced in 2003 to evaluate the impacts of the policy on local residents' physical activity behaviours and health. This paper synthesised the findings from the 10 years of outputs from the RESIDE project with the view to identifying the key performance indicators of the policy to promote active living and positive health outcomes.

Methods:

All built environmental features measured in each RESIDE paper were mapped against a related LN requirement and associations with the respective health and wellbeing outcomes extracted. All studies were coded for their design (cross-sectional or longitudinal), type of predictor variable (objective or perceptions), statistical analysis and adjustment variables and the direction of findings with the health outcome (positive, negative or no associations). The magnitude, strength and consistency of evidence for each LN principle with each health outcome were then systematically rated.

Results:

Thirty-four RESIDE papers addressing 14 different health outcomes were included (walking for transport; walking for recreation; total walking; cycling for transport; cycling for recreation; children's independent mobility; public transport use; body mass index; mental health; sense of community and connectedness; fear of crime, perceived crime risk, perceived safety and victimisation). The strength of evidence for each of the policy requirement was assessed in terms of the greatest and most consistent associations across the multitude of health behaviours and outcomes.

Conclusions:

This paper synthesised findings from a unique 10 year natural experiment of an operational planning policy designed to create more 'liveable' suburban neighbourhoods. It provides an evidence-based list of the 'key' policy requirements, positively and consistently associated with a number of physical activity or health behaviours and outcomes. These findings are being considered by the Department of Planning for inclusion as key performance indicators in the revised policy due for release in 2015.

SO2.4.6

Are retirement villages promoting active ageing?

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: It is well recognised that being physically active reduces the risk of many chronic diseases associated with ageing. RVs are becoming an increasingly popular residential option for the ageing population and a key area to support physical activity in older people. This study reports on the physical activity (PA) facilities of retirement villages (RV's) and the neighbourhood physical activity barriers reported by RV residents located in Perth, Western Australia.

Methods: Initial contact was made with RVs managers to conduct this research. Observational and self-report data were collected from 50 RVs containing 30+ independent living units (ILUs). The Audit of Physical Activity Resources for Seniors (APARS) was used to determine facilities and programs provided. Brief telephone interviews with the RV residents (n=200) were conducted to identify neighbourhood barriers to walking.

Results/findings: Nine-two percent of RV managers contacted agreed to participate in the study. RV residents (n=200) were aged 43-101y with a mean age of 79 years (SD 67-91y). The larger RVs (101+ ILUs) offered 57 different facilities that supported PA, while smaller RVs (<100 ILUs) offered less (n=26). 'Outside exercise facilities' rated highly in larger RVs with a mean score of 6.67 compared to 1.0 in smaller RVs and 'inside exercise facilities' rated highly with a mean score of 7.5 compared to 1.9 in smaller RVs. Neighbourhood barriers to walking were reported as being a 'significant barrier' by one-third (n= 68) of those surveyed. The main barriers were: 'hills'; 'unsafe streets'; and 'fear of crime/strangers'.

Conclusion: The positive response by RV managers to participate in this study (92%) may indicate increasing recognition of the importance of PA and healthy ageing. the *Health Promotion Journal of Australia's last (the health journal of Oz)*. The focus will be on 'food', so join the conversation Larger sized RV's provided more PA facilities and programs. The age range of residents (43-101y) may indicate the challenges RVs face when trying to provide facilitate and programs for residents. More research is required to better understand the PA supports currently provided and what can be done to better support the PA levels of RVs residents.

SO2.4.7

Identifying and validating policy-relevant, national spatial measures of walkability

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Neighbourhoods with greater land use mix, more connected street networks, mid-high residential densities, and pedestrian and public transport amenities support higher levels of local walking. In Australia to date, measures of walkability have been operationalized within cities, but have not been extended nationally as comparable spatial data have not been available. Furthermore, common measures of walkability have not stemmed from contemporary urban planning policies. Accordingly, we aim to develop a suite of policy-relevant, valid, spatial walkability measures that can be operationalized at the national level.

Methods:

Australian state-government planning policies related to walkability were reviewed. In scope were policies that were spatially attributable and related to 'walkability', such as street design, residential density, land use mix, retail configuration, car parking, public transport provision, and walking paths. Spatial data available to populate these measures nationally were simultaneously identified. The proposed list of measures was circulated to policy makers prior to finalisation. Initially, the spatial policy measures will be validated with geo-coded health data in the state of Victoria, Australia. Behaviours such as overall walking, and walking for transport and recreation, will be tested with the spatial measures. Indicators of measures most highly associated with walking will be generated and mapped at the Statistical Area 2 level (~10,000 persons/area) across Australia.

Results:

Ten spatial policy-relevant walkability measures using national-level data were identified: street connectivity, dwelling density, activity centres, block size, building height, housing and destination diversity, land use mix, retail-floor area ratio, and the overall walkability index. Measures are being developed at different spatial scales (400m - 1,600m street network buffers) and tested with a range of walking behaviours. Once tested, measures with the highest associations will be mapped at the Statistical Area 2 level across urban Australia.

Conclusions:

Creating consistent spatial measures of walkability will facilitate national-level research in Australia. Furthermore, validated, policy-relevant measures of walkability can inform urban planning internationally by identifying intervention points and enabling comparisons between diverse environments.

SO2.4.8

Surrounding community residents' perceived expectations of HOPE VI for neighborhood-based physical activity

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Research studies assessing urban redesign to promote healthier behaviors and wellbeing of community residents often exclude policy level factors or community residents' perspectives for how these changes will influence behavioral outcomes. We used a community engaged research approach to examine surrounding community residents' perceived expectations for a HOPE VI development on changes to their community, health and physical activity. For the purpose of this research, we present results related to physical activity only.

Methods: Fifty-nine women and men from the HOPE VI community engaged in concept mapping, which is a mixed methods approach, where participants generate, sort, and rate ideas. Participants completed surveys and attended concept mapping data collection sessions which included: nominal group meetings to elicit statements related to potential neighborhood, health and physical activity changes related to HOPE VI and structuring meetings where they sorted and rated statements (1 = least important to 5 = most important) based on similarity and relative importance. Concept Systems® Software generated clusters of ideas, cluster ratings and t-tests of significant differences in cluster ratings.

Results: The average age of participants in the study was 45.5 years (±14.3), 37% reported annual household incomes of less than \$11,000 and 25% were unemployed. The majority were female, 72%, and 88% reported high school or more. On average, respondents lived in the community for 16 years (±16.3) and 40% reported that they owned their home. Participants generated 197 unique statements that yielded thirteen thematic clusters related to expected changes for the community, health and physical activity. Three of those clusters specifically referenced physical activity. Themes represented from these clusters were "Increase Leisure Physical Activity" (average rating of 4.15), "Safe Play Areas" (average rating 4.24), and "Generate Health Promoting Resources" (average rating 4.04). T-tests indicated that there were no significant differences in the average relative importance across the clusters.

Conclusions: This research provides insight into the potential impacts of housing initiatives from the perspective of those most affected by such initiatives. The findings also highlight environmental changes as potential mechanisms that may improve residents' perceptions of the community and encourage healthier lifestyle behaviors.

SO3.4. SHORT-ORAL: Physical activity in children

SO3.4.1

The effectiveness of interventions on sustained childhood physical activity: a systematic review and meta-analysis of controlled studies

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Increased physical activity (PA) has been associated with a reduction in non-communicable disease risk factors and outcomes. However, interventions to increase childhood PA typically produce small to negligible effects. Recent reviews are limited due to lack of post-intervention follow-up measurement. This review aimed to examine measured effects at least six months post-intervention.

Methods:

We searched PubMed, MEDLINE, EMBASE, PsychINFO, ScienceDirect, SportDiscus and Google Scholar between 01/01/91 & 01/11/14 for controlled studies reporting six-month post-intervention measurement for children aged 5-18 years. 14 studies met inclusion criteria; 12 reported moderate-to-vigorous PA (MVPA) (n = 5790) and 10 reported total PA (TPA) (n = 4855). We calculated overall effect estimates and 95% CI's using random effects modelling with inverse variance weighting. Mean difference was calculated for MVPA, with standardised mean difference calculated to TPA due to measurement variation. Meta-regression assessed heterogeneity by continuous level variables.

Results:

Negligible mean difference in MVPA existed in favour of the intervention group, amounting to 1.47 (95% CI -1.88, 4.82) mins/day compared to controls, while no difference was recorded on TPA. Sub-group analyses revealed males (2.65 mins/day: 95% CI 2.03, 3.27) reported higher levels of MVPA than females (-0.42 mins/day: 95% CI -7.77, 6.94), community settings (2.67 mins/day: 95% CI 2.05, 3.28) were more effective than school settings (1.70 mins/day: 95% CI -4.84, 8.25), and that treatment (4.47 mins/day: 95% CI -0.81, 9.76) demonstrated greater effects than population approaches (1.03 mins/day: 95% CI -2.54, 4.60). Meta-regression revealed no significant differences by factor on pooled effects. Significant heterogeneity existed between studies and potential for small study effects was present.

Conclusions:

Improved PA levels subsequent to intervention were not maintained six month post-intervention. A potentially useful avenue of future research is to specifically explore community treatment of high risk individuals.

SO3.4.2

Feasibility of short activity breaks for increasing preschool-age children's physical activity levels

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Background: Due to the intermittent nature of preschool-age children's play patterns; researchers have suggested that higher levels of moderate-to-vigorous physical activity (MVPA) could be attained by exposing preschoolers to shorter bouts of structured (SBS) physical activity (PA) throughout the preschool-day.

Objective: To examine the effects of shorter bouts of structured SBS-PA implemented within the classroom setting as part of designated gross-motor playtime on preschoolers PA levels.

Methods: Ten preschool centers were randomized to SBS-PA (centers, n=5; participants, n=141) or unstructured free playtime (UPA, centers, n=5; participants, n=150). SBS-PA consisted of structured PA implemented in the classroom during the first 10 minutes of gross-motor playtime followed by 20 minutes of free playtime. UPA consisted of 30 minutes of unstructured free playtime. Teachers were asked to implement both conditions during morning and afternoon gross-motor playtime, five days/week for six months. PA was assessed with accelerometers (preschool-day) and direct observation (30-min sessions). Generalized linear mixed models were used to examine the impact of the intervention.

Results: Approximately 95% of SBS-PA teachers implemented the 10-minute structured PA intervention; however, only 49% implemented the 20-minute free playtime portion of the intervention. In the UPA group, 75% of teachers implemented the 30-minute free playtime intervention. Relative to 30-minute sessions (direct observation) significant group main effects were observed for intervals at light ($p < 0.0001$) and MVPA ($p = 0.0009$). Compared to baseline, intervals spent in light PA significantly increased in SBS-PA group but did not change in the UPA group. In the SBS-PA group, percent of intervals spent in MVPA increased from baseline to 3-months then decreased at 6-months to baseline values. In the UPA group, percent of intervals in MVPA decreased between baseline and 3-months then increased back to baseline values at 6-months. Relative to preschool-day PA, significant group by visit interaction was observed for percent time spent in total preschool-day MVPA ($F(2, 254) = 3.54, p = 0.03$). Percent of time spent in MVPA significantly decreased in both the SBS-PA and UPA groups at 3-months and at 6-months.

Conclusion: SBS-PA can be implemented into the classroom settings; however, further research is needed to examine its impact on preschoolers PA levels.

SO3.4.3

Child-care center characteristics associated with preschoolers' physical activity at the center and over the full 24-hour day: the importance of giving time and space to play

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SIG: Yes, Early care and education

Awards: No

Purpose: To identify child-care center characteristics associated with children's moderate to vigorous physical activity (MVPA) while in the center and over the 24-h day. No previous studies have identified center influences across a variety of seasons and temperatures or assessed whether center effects persist when including children's physical activity levels outside the center.

Methods: Observational study of 388 preschoolers in 30 randomly-selected child-care centers in Cincinnati, Ohio conducted from Nov 2009-Jan 2011, covering all seasons including 2 winters. MVPA was measured with Actical accelerometers (15-s epoch). Hypothesized independent variables were derived from the socio-ecological model and were directly observed: portable play equipment, indoor gym, playground size and vegetation, TV/computer use, and observed time outdoors. Planned daily outdoor time and staff training were assessed through director/staff surveys. Mixed model analysis of variance, adjusting for age, sex and center as a random effect, was used to evaluate the association between independent variables and time in MVPA over the child-care day and 24-h day.

Results: 90% of directors scheduled ≥ 2 daily outdoor sessions, yet for only 40% of children were ≥ 2 outdoor sessions observed, and 32% had no time outdoors. 83% of directors scheduled ≥ 60 minutes outdoors, yet only 28% of children experienced this. Of the 11.7 h/d awake, children spent a mean (SEM) of 2.0 (0.06) min/h in MVPA. Children were least active at home (MVPA 1.6 min/h) and most active on the child-care gym and playground (MVPA 9.0 and 7.3 min/h, respectively). In the final multivariable model, children with ≥ 60 minutes outdoor time engaged in 0.6 min/h more MVPA over the child-care day ($p=0.003$), and 0.5 min/h over the 24-h day ($p=0.02$) than those that did not. A large playground was also significantly related to children's 24-h MVPA ($\beta=0.48$, $p=0.007$). An indoor gym, portable play equipment, staff training, and TV/computer use were not related to children's MVPA.

Conclusions: Outdoor time occurred less frequently than scheduled. Children with at least 60 minutes of outdoor time at the center were significantly more active than children without. This suggests centers may increase preschoolers' physical activity by following daily schedules and having a large playground.

SO3.4.4

Can physical activity improve cognition in children with ADHD and Reading Difficulties? Findings from a preliminary intervention

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Objective:

Physical activity is beneficial for many psychological factors. Recent longitudinal studies have shown positive relationships among physical activity, academic attainment, executive functions, and behavior in typically developing (TD) young people.

Attention-Deficit-Hyperactivity-Disorder (ADHD) and reading-difficulties (RD) are commonly reported in children, with high rates of co-occurrence. Both of these difficulties are associated with deficits in a range of factors, especially executive functions. Emerging research suggests that programmes of physical activity can lead to positive improvements, however a paucity of interventions have been reported for children with such difficulties. The present study explores whether a pilot physical activity programme improves cognition and behaviour in children with ADHD, RD, and co-occurring ADHD-and-RD.

Method:

68 children, aged 9-12, took part in the present study: 15 with ADHD; 15 with RD; 15 with co-occurring ADHD + RD; and 23 TD. Participants completed tasks assessing: IQ; reading; working memory; inhibition; shifting and planning. Levels of physical activity were recorded using accelerometers. Parents and teachers also completed behavioural questionnaires. Half of the participants took part in a 12 week physical activity programme. Following this, all participants completed the same measures as at baseline. A delayed control design was employed whereby the control group then took part in the intervention before completing the assessments again.

Results:

Levels of moderate-to-vigorous physical activity (MVPA) were similar for all groups at baseline with the ADHD group averaging 62 mins/day, the RD group 61 mins/day, the co-occurring group 66 mins/day and the TD group 64 mins/day. Baseline task performance was controlled for using Analysis of Covariance. Taking part in the intervention led to improvements in working memory scores for those with ADHD and co-occurring difficulties ($p<0.05$, $\eta^2=0.33$). A trend for improvement was also seen for the RD and TD group compared to those who did not take part in the intervention.

Conclusions:

A physical activity programme resulted in selective score improvements for those with ADHD and co-occurring difficulties. Further analysis is planned following the completion of the intervention by the control group in December 2014. These findings have implications for treatment for ADHD and co-occurring difficulties.

SO3.4.5

Predicting Changes in Child Physical Activity and Three Types of Parental Support Behaviors across 12 Months

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: The benefits of regular physical activity for children have been well-established, yet participation rates are extremely low. Parental support has been established as the critical family-level variable linked to child activity with encouragement, parent-child co-activity, and logistical transport as key support behaviors. The purpose of this paper was to model these specific parental support behaviors within an adapted theory of planned behavior framework across three, six-month waves of longitudinal data.

Methods: Participants were a representative sample of Canadian mothers (N = 1,253) with children aged five to 12 years of age, who completed measures of the theory of planned behavior applied to each support behavior, an assessment of each support behavior prevalence, and perceptions of the physical activity of their children.

Results: Three-wave autoregressive structural equation models showed modest fit of these data across all three support behaviors. All three parental supports accounted for significant ($p < .01$) variance in child physical activity between participants (19% logistical; 42% encouragement; 30% co-activity) and within-participant physical activity change with the exception of co-activity (5% logistical; 5% encouragement; 1% co-activity). Intention and perceived behavioral control explained each support behavior while small effects of attitude and large effects of perceived behavioral control explained intention.

Conclusions: Interventions focusing on parental attitudes about support will yield minimal intention or behavior changes. Mothers are inhibited by a low perception of control over support of physical activity, either directly or through intention, and this generalizes to various support behaviors and explains between-participant differences and within-participant changes over time. Interventions aimed at increasing control over support that span a socio-ecological frame are recommended.

SO3.4.6

A PROCESS EVALUATION OF THE NEWHAM'S EVERY CHILD A SPORTSPERSON PROGRAMME

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: In response to the alarming levels of overweight and obesity among children in London and across the UK, focus on increasing physical activity and sport (PAS) among children and young people through innovative interventions was declared a major goal of the legacy of the London 2012 Olympics and Paralympics. The Newham's Every Child a Sports person (NECaSP) programme is one intervention that utilises both school-based and community based strategies to deliver access to more than 20 sports, in addition to the national PE curriculum, to all Year 7 (11-13 year old) pupils from secondary schools in the Newham borough of East London. The purpose of this study is to present the findings of a process evaluation of the intervention.

Methods: A systematic approach was taken to evaluate the intervention delivery quantity, quality and evaluation of the intervention by participants and teachers via questionnaires, content analysis of email and programme records, and direct observation.

Results: The programme was delivered in its entirety for 44% of the Year 7 schools in Newham. Lack of room in their curriculum and costs for transportation and staff time were identified as barriers to participation for schools who did not participate in the programme. Overall, there were few barriers to pupils' participation in the NECaSP programme activities. Participants believed the programme encouraged them to be more sporty and more healthy. Heads of PE, who were ultimately responsible for the delivery of the intervention in their schools also believed that the NECaSP met their expectations and was a good experience for the pupils and themselves.

Conclusions: It is recommended that the intervention components are examined to identify areas that might be eliminated to create a 'light' version of the programme that can be easily delivered within time constrained schools. This process evaluation has identified that further administrative, educational and financial support will help facilitate the success of the programme and its goals for adolescents in East London.

SO3.4.7

Latino Father's perspective on how to best recruit and engage them in research studies and interventions regarding their children's physical activity

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: There is growing evidence fathers have an important role in influencing children's behaviors, but have been difficult to engage in studies. Our objective was to understand how to best recruit and engage Latino fathers in studies and interventions regarding their children's physical activity (PA). Latino fathers were targeted due to obesity disparities found among Latino children in the US.

Methods: Qualitative semi-structured interviews were conducted with 20 Latino fathers of children ages 3- 11 years. Interviews were conducted in English or Spanish and recorded. Transcriptions were coded by two bilingual coders using inductive thematic analysis, with an emphasis on cultural values.

Results: The fathers' mean age was 34.4 (sd 7.9) years, 65% did not finish high school, and 65% were born outside the US. The majority (18/20) of fathers felt that both mothers and fathers should be included in studies regarding their child's PA. Initial themes that emerged included father's perceptions of co-parenting (parents are equal and should have an equal role in their child's activities; parents have different skills and can help each other), familism (having both parents involved motivates child; family can bond together), collectivism (together parents can get better ideas to benefit child), and gender roles (it is the mother's role to feed and care for child). Fathers hoped to learn from a program about being active with their child, how to guide/teach their child, and learn more about their child. Lack of time was a barrier to participate. 18/20 stated they would be willing to wear activity monitors to measure their and their child's PA; those that weren't, was due to work conditions that prohibited wearing electronic devices.

Conclusion: Findings from this study suggests that Latino fathers feel they have an important role in studies and programs regarding PA for their child. To best recruit and engage them, studies should focus on promoting the importance of fathers as guides and teachers for their child, as well as collectivism and familism. While many of the Latino fathers emphasized the importance of co-parenting, others described cultural gender roles in parenting which researchers should consider when designing interventions.

SO3.4.8

The effect of a whole school physical activity intervention on high and low active children's pedometer measured physical activity.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: To assess whether pedometers can be used to promote increased physical activity (PA) in the school day for pupils with different levels of initial PA.

Methods: A quasi-experimental study was conducted with students in Year 3 to 6 in a primary school in NW England. During the 5-week Pedometer Challenge, children wore a Yamax Digi-Walker 200 during school hours, recording their steps at the end of each day.

Results: Following data cleaning, 47 males and 52 females were included in the analyses. To examine the difference in average weekly steps between activity groups, children were separated into the Highest 50th (>6116 steps) and Lowest 50th (≤6116 steps) percentile using mean daily pedometer scores from week one. Results of the gender (2) by activity group (2) by week (2) repeated measures ANCOVA (step length) revealed a significant main effect for week ($F_{(1,93)} = 5.845, p=0.018, d=0.24$), with children accumulating more steps in week five compared to week one. A significant interaction between week and activity group ($F_{(1,93)} = 29.562, p=0.000, d=1.11$) revealed that children in the Lowest 50th group significantly increased their steps from week one to week five (1074 steps; $F_{(1,47)} = 20.847, p=0.000, d=0.93$), while the Highest 50th did not ($F_{(1,47)} = 0.000, p=0.990, d=0$). In the Highest 50th group, but not the Lowest 50th group, a significant gender by activity group interaction ($F_{(1,93)} = 9.293, p=0.003, d=0.63$) demonstrated that males accumulated significantly more steps than the females (1101 steps; $F_{(1,46)} = 14.701, p=0.000, d=0.81$).

Conclusions: Over five weeks, pedometers helped to prompt an increase in measured physical activity of the lowest active children within a primary school. Importantly, this was achieved while integrating these pupils within whole-school activities. Children who are the most active (predominantly high-active boys) may not have capacity to increase their step counts during the school day. Further study is needed to determine the sustainability and feasibility of such an approach on a larger scale.

SO4.4. SHORT-ORAL: Physical activity interventions in adults

SO4.4.1

Adherence and feasibility to a 6-month multicomponent physical activation intervention in young men

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose:

Physical activity (PA) and behavior change intervention studies often neglect reporting of adherence to different components of intervention. The purpose here was to examine adherence and feasibility to a 6-month multicomponent intervention in young men.

Methods:

A population-based sample (N=506) of conscription-aged men (18 years) attending compulsory annual call-ups for military service were recruited to a 6-month activation intervention. The subjects were randomized to intervention (N=255) and control (N=251) groups. Daily PA was measured in both groups. The intervention group utilized an online gamified activation service, including communal youth services, continuous PA measurement and feedback, social networking, tailored health information, and exercise programs. The service was based on transtheoretical behavior change model. The usage of the service was monitored by logs. Monthly reminders about the service and PA data uploading were sent by e-mail and SMS. A questionnaire on health, health behavior, diet, and wellbeing was administered at baseline and at 6 months.

Results/findings:

PA data were obtained from 276 (55%) young men, with 15 364 (76.4%) valid days (wear time >500 min). In the intervention group a total of 161 (63%) men visited the service. The main reasons for not registering were: no need for the information provided by the service, laziness, and forgetting. Totally 1044 visits were logged (individual range 1-202, median 3). The rate of use decreased during the study, being 400 visits during the first month and 69 during the sixth month. The participants considered the personal PA statistics and feedback most important parts of the service. This was confirmed by the log data. At six months, questionnaire data were obtained from 370 men (78% in the intervention group and 68% in the control group). In the intervention group, two thirds of the respondents considered that feedback motivated them to increase PA.

Conclusions:

The multicomponent web-based service appeared to be feasible method for activating in young men.

SO4.4.2

Evaluation of a Community-Based Intervention to Promote Physical Activity to the Inactive Using Sport: Lessons from Fun & Fit Norfolk

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: To test the effects of a community-based physical activity (PA) intervention designed to increase PA using 10 weeks of free structured, coached, sport sessions targeted to inactive adults.

Methods: Data were analysed from 680 adults in the early phases of the Fun & Fit programme, Norfolk, UK. The programme provided a menu of 10 week physical activity courses covering a wide range of sports in the county of Norfolk. The programme was advertised widely using broadcast, print, and electronic media with a particular focus on areas of high deprivation and health need. Participation was open to all members of the population who were classed as 'inactive' from a screening question (<=1d of >=30mins of moderate physical activity per week). Sign-up was largely web based, but telephone sign-up was possible, and participants selected the sport of their choice. Attendance registers were taken at each session and we used the Short International Physical Activity Questionnaire (IPAQ) to assess weekly PA at baseline, week 10, 6 and 12 month follow-up. This was used to calculate change in participant's total weekly physical activity (METS) at follow up and categorise them as having low, moderate or high physical activity levels at baseline.

Results: Participation in the Fun & Fit programme was associated with non-significant increased median (IQR) weekly PA across all participants that was independent of baseline PA level at 10 week (+576.0 METS (-170.6, 2174.3)) and 6 month follow-up, (+693.0 METS (-31.8, 1787.0)). Significant increases in median weekly PA were observed in participants with low baseline PA levels at 10 week, (+931.0 METS (178.3, 2556.8)) and 6 month follow-up, (+858.8 METS (377.8, 2149.5)), compared to baseline. Increases in PA amongst the moderately active at baseline were small.

Conclusions: These findings suggest that offering a free 10 week course of activities targeted to a less active population may increase their weekly physical activity in both the short and long term.

SO4.4.3

PROMOTING EXERCISE IN OLDER MALAYSIANS USING SMS REMINDERS

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Objective: This is the first trial assessing the impact of encouraging SMS reminders to increase exercise adherence in inactive older adults. The aim of this research was to compare the exercise frequency of participants who received an exercise booklet with those who received the same booklet and SMS reminders.

Methods: A 12-week randomized controlled trial (RCT) was conducted in adults aged between 55 and 70 years who did not have an exercise routine. Participants in the non-SMS condition ($n = 21$) received an exercise program booklet, whereas participants in the SMS condition ($n = 22$) received additional daily exercise reminders in the form of text messages. Participants were followed-up for another 12 weeks after the intervention. The primary outcome of exercise frequency was measured via diary self-report. Secondary outcomes included overall physical activity, exercise self-efficacy, BMI, leg- and grip-strength. For the intervention phase, exercise frequency was compared between groups using independent t-test, and ANCOVA to control for significant outcome predictors. Mixed-model ANOVAs were used to assess differences in secondary measures. Follow-up data (24 weeks) were analyzed using mixed-model ANOVAs. All statistical procedures were performed using SPSS version 20.

Results: There were no differences between groups at baseline for all variables. After the intervention period, the SMS group's weekly exercise frequency was higher ($M = 3.7$, $SE = .32$) than that of the non-SMS group ($M = 2.5$, $SE = .4$). This difference was significant $t(37) = 2.304$, $p = .027$ ($d = .76$). The effect remained significant after controlling for the effect of exercise self-efficacy, $F(1, 36) = 6.806$, $p = .013$, partial eta squared = .159.

Conclusions: SMS reminders increased exercise program adherence in older adults. Considering the increasing adoption of technology by older adults, the results of this study present a promising pathway for future health behavior research and intervention.

SO4.4.4

Feasibility and preliminary efficacy of an online intervention to increase physical activity in Nova Scotian cancer survivors

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Student Competition

Purpose: Physical activity (PA) improves symptom control, quality of life and possibly survival in cancer survivors but participation rates are low. Research shows that behaviour change interventions may positively influence PA but traditional behaviour change methods can be time consuming and costly. Previous research into the PA counselling and programming preferences of cancer survivors in Nova Scotia (NS) revealed that approximately 50% of the sample indicated they would be willing to receive PA information online. The purpose of this study was to determine the feasibility and preliminary efficacy of an internet-delivered PA intervention among cancer survivors living in NS.

Methods: 415 cancer survivors previously surveyed were contacted via email, mail or telephone with a study invitation. Once baseline measures were completed, participants were randomized into either a PA behaviour change program for NS cancer survivors on the website UWALK.ca (UCANS) or the usual care group (UC). After the intervention period (10 weeks) post-study measures to evaluate the program and website were completed. Descriptive analyses from surveys and web analytic software were used to assess feasibility and efficacy.

Results: Recruitment concluded on October 15th, 2014 and we randomized 95 cancer survivors in rolling blocks (UCANS=48; UC=47) resulting in a 22.9% recruitment rate. The majority of participants were not meeting minimum PA guidelines (54%). Average logins for those completed was 10.7 over the intervention period (i.e. about once per week). Preliminary evaluation of the program and website is favourable with most having enjoyed the ANS program (85.7%), reporting increased PA (64.3%), reported increased awareness of PA levels (78.5%), found the information modules were useful and relevant (85.7%), liked the videos (71.4%) and didn't find the videos burdensome on their computer (71.4%). The majority also found the UWALK site easy to navigate (64.3%), easy to track PA (71.4%) and would recommend the site to their friends (71.4%).

Conclusions: Preliminary evidence suggests the online Active Nova Scotia program and website are efficacious as an internet-delivered PA behaviour change intervention. The study intervention began September 3rd, 2014 and is ongoing to be concluded December 17, 2014.

SO4.4.5

Program reach and participation in a workplace health promotion program: associations with employee characteristics and physical activity levels.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: The aim of this cross-sectional study was to investigate health factors associated with availability of, and participation in, Healthy@Work, a comprehensive health promotion program implemented in the Tasmanian State Service, Australia.

Methods: Data from 3228 state service employees were collected in 2013 on sociodemographic and work characteristics, health-related behaviours (smoking, nutrition, alcohol consumption, physical activity, sedentary behaviours), and employee-reported availability of, and participation in, types of health-related activities. Ratios of prevalence (PR) of availability and of participation between levels of study factors were estimated using Poisson regression with robust errors. Analyses were adjusted for age, sex, work schedule and further adjusted for reported availability of programs in participation analyses.

Results: Physical activity programs were the most commonly reported activity type available. Among respondents who reported 'walk-and-talk' active meetings or physical activity programs available to them, 51.9% and 54.0% respectively participated. Significant disparities in availability of activities were reported. For example, respondents who reported sitting at work for 6 or more hours on a typical day were 47% more likely to report having more programs available to them (PR = 1.47, 95% CI 1.34, 1.61), compared to those sitting less than 3 hours/day. Prevalence of reported participation in two or more activities was lower for those with reported cardio-metabolic health conditions relative to those without (PR = 0.80, 95% CI 0.68, 0.39), and by current smokers relative to never smokers (PR = 0.68, 95% CI 0.53, 0.88). Alternatively, it was higher among those with higher levels of leisure-time physical activity (LTPA) (trend $p < 0.05$). For example, respondents reporting ≥ 150 mins/week (LTPA) were 23% more likely to have participated in multiple programs relative to those reporting no LTPA.

Conclusions: Availability of activities was variable, and levels of participation were lower among some at risk groups. Efforts to minimise these disparities through flexible or targeted program delivery may improve participation. Programs appear to have been easier to implement in workplaces where occupational sitting is common, but only physically active respondents were more likely to have participated in multiple programs. 'Walk-and-talk' and other physical activity programs are likely to be well received if made available.

SO4.4.6

Effectiveness of a 12-week physical activity coaching intervention at the workplace on well-being, sedentary behaviour and physical activity.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The purpose of the present study was to evaluate the short-term effects of a 12-week physical activity (PA) coaching intervention delivered at the workplace. The intervention was guided by the principles of Self-Determination Theory (SDT).

Methods: A quasi-experimental controlled study was used. The study population consisted of 342 employees (mean age = 41 years, 77.8% women) recruited from a large pharmaceutical company in Flanders (Belgium). Participants were assigned to a control (N = 54) or to an intervention (N = 288) group. Participants in the intervention group received a 12-week behavioural support intervention, which consisted of two face-to-face counselling sessions at the start of the intervention, short contacts by e-mail or telephone at weeks 3, 6 and 9, and two face-to-face counselling sessions at the end of the intervention. The PA counselling sessions were delivered by qualified PA coaches (Masters in Kinesiology) and were aimed to satisfy the basic needs proposed by SDT (autonomy, competence and relatedness). Outcome measures included aerobic fitness (3 minutes YMCA step test), self-reported physical well-being (Marcoen et al., 2002), self-reported sitting time (IPAQ-short version) and objectively assessed steps per day (Sensewear Armband). Data were collected at baseline and post-intervention.

Results: Significant time by group interaction effects were found for self-reported physical well-being ($F=5.29$, $p < 0.05$), self-reported sitting time at weekend days ($F=7.04$, $p < 0.01$) and average steps per day ($F=15.65$, $p < 0.001$). After 12 weeks, no significant changes were found in the control group. In the intervention group, a significant increase in physical well-being, decrease in sitting time at weekend days (-50 min/day) and increase in the average number of steps per day (+1412 steps per day) were found after 12 weeks. No intervention effects were found for self-reported sitting time at weekdays and performance on the 3 minutes step test.

Conclusion: This worksite PA intervention study showed that a 12-week PA coaching intervention is a promising strategy to improve employees' well-being and to decrease their sedentary behaviour and increase their daily levels of PA.

SO4.4.7

Cost-effectiveness of the Active Plus intervention: a Web-based or print-delivered tailored intervention to promote physical activity among adults aged over fifty

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Purpose: This study provides insight in the cost-effectiveness and cost-utility of the different conditions of a computer-tailored physical activity (PA) intervention (Active Plus) among adults aged over fifty. Until now very little research has been conducted on the cost-effectiveness of computer-tailored PA interventions. The economic burden of insufficient PA, which increases in an aging population, stresses the urgency for cost-effective interventions to promote PA among older adults.

Methods: The intervention conditions (i.e. print-delivered basic (PB; N = 439), print-delivered environmental (PE; N = 435), Web-based basic (WB; N = 423), Web-based environmental (WE; N = 432)) and a waiting-list control group were studied in a clustered randomized controlled trial. Intervention costs were registered during the trial. Societal costs, consisting of intervention costs, health care costs, participant costs and productivity losses were identified and compared with the intervention effects on PA (in MET-hours per week) and quality-adjusted life years (QALYs) 12 months after the start of the intervention. Cost-effectiveness ratios (ICERs) and cost-utility ratios (ICURs) were calculated. Non-parametric bootstrapping techniques and sensitivity analyses were performed to account for uncertainty.

Results: As a whole (i.e. the four intervention conditions together) the Active Plus intervention was found to be cost-effective. The PB-intervention (ICER = €-55/MET-hour), PE-intervention (ICER = €-94/MET-hour) and the WE-intervention (ICER = €-139/MET-hour) all resulted in higher effects on PA and lower societal costs than the control group. With regard to QALYs, the PB-intervention (ICUR = €38,120/QALY), the PE-intervention (ICUR = €405,892/QALY) and the WE-intervention (ICUR = €-47,293/QALY) were found to be cost-effective when considering a willingness-to-pay threshold of €20,000/QALY. In most cases PE had the highest probability to be cost-effective.

Conclusions: The Active Plus intervention was found to be a cost-effective manner to increase PA in a population aged over fifty when compared to no-intervention. The tailored Active Plus intervention delivered through printed material and with additional environmental information (PE) turned out to be the most cost-effective intervention condition as confirmed by the different sensitivity analyses. By increasing PA at relatively low costs, the Active Plus intervention can contribute to a better public health.

SO4.4.8

Reach and implementation of the 10,000 Steps pedometer grant scheme for workplaces: A research translation study

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Workplaces launching their own physical activity initiatives frequently cite cost as a barrier to implementation. Over 1,750 Australia workplaces have conducted a workplace physical activity initiative as part of the 10,000 Steps project. This study describes the reach and implementation of a workplace, pedometer grant scheme initiative, administered by 10,000 Steps Australia.

Methods: In August 2014, the 10,000 Steps project initiated a grant scheme inviting workplaces located in Queensland, Australia to apply for up to 200 pedometers to assist in implementing a workplace physical activity initiative. The rationale was that the cost of pedometers is the major cost and barrier to implementation and by reducing this barrier it may be possible to attract a higher proportion of high risk workplaces (eg. transport, mining, small enterprise). Workplaces who received a pedometer grant (grant workplaces) were compared to workplaces (n=34) participating in the 10,000 Steps project in the 6 months prior to the grant scheme and did not receive support in obtaining pedometers (comparison workplaces).

Results: A total of 137 applications were received, 131 grants were awarded. Applications were received for a total of 12,206 pedometers (M = 93.9 pedometers / workplace), 11,977 pedometers were awarded (M = 91.4 pedometers / workplace). The scheme was closed after 8 days as the total number of pedometers applied for had exceeded the maximum available. Approximately 12%, 56%, and 32% of grant workplaces were small (1-19 employees), medium (20-199 employees) and large sized (200+ employees) workplaces respectively compared to 17%, 38%, and 44% of comparison workplaces. Approximately 5%, 4%, and 4% of grant workplaces were from Transport, Construction and Manufacturing respectively compared to 3%, 6%, and 9% of comparison workplaces.

Conclusions: The Pedometer Grant Scheme was popular and attracted considerable interest in a short period of time. The scheme attracted a higher percent of high risk workplaces, though the difference was small. The Scheme was well subscribed to by medium and large sized workplaces likely reflecting their greater capacity to apply for and implement a workplace activity initiative. Individual workplace reports on the intervention implementation are available from April 2015 and will also be discussed.

SO5.4. SHORT-ORAL:

School-based interventions in children and adolescents

SO5.4.1

Maternal and paternal support for physical activity and healthy eating in preschool children

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: To investigate 1) associations between maternal and paternal support for physical activity (PA) and fruit and vegetable consumption (FV), and PA and FV behaviour in preschool children; and 2) to identify familial patterns of maternal and paternal support for PA and FV, and examine their impact on child PA and FV behaviour.

Methods: This cross-sectional study utilised data from 173 parents of preschool children (51% male, aged 2-5 years) participating in the Healthy Home Child Care Project in Oregon, USA. Maternal and paternal social support for PA and FV, and child PA and FV behaviour were assessed through parent surveys using valid and reliable measures. Partial Pearson correlations were used to evaluate associations between maternal and paternal support for PA and FV, and child PA and FV behaviour controlling for child age, parental age and parental education. K-means cluster analysis was applied to identify families with distinct patterns of maternal and paternal support for PA and FV, and one-way ANOVA was used to examine their impact on child PA and FV behaviour.

Results: Maternal and paternal support for PA were positively associated with child PA in girls ($r = 0.45p < 0.001$) and boys ($r = 0.31$ and $r = 0.26$, $p < 0.05$). Maternal but not paternal support for FV was positively associated with child FV in boys ($r = 0.26$; $p < 0.05$) and girls ($r = 0.46$; $p < 0.001$). Cluster analysis identified five distinct family types which differed on the level and consistency of maternal and paternal support for one or both behaviors. Children from families with high maternal and paternal support for both behaviours had significantly higher PA and FV than those with low maternal and paternal support for one or both behaviours.

Conclusions: Maternal and paternal support for PA may positively influence PA in preschool children. Maternal but not paternal support for FV may positively influence FV in this age group. Child PA and FV levels are highest when both parents provide support for PA and FV. Hence, both parents should be involved in interventions to promote PA and FV in young children.

SO5.4.2

Parent and Adolescent Perception of Parental Involvement and Obesity-Related Behaviors: Who Matters Most?

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objectives: A substantial literature has examined the role of parenting practices in adolescents' diet and activity behaviors. However, most studies have relied exclusively on parental reports of their parenting, ignoring adolescent perceptions. This study offers an important scientific advance by taking a dyadic approach to evaluate the unique contribution of parents' and adolescents' perspectives of parenting practices in adolescents' eating and activity behaviors.

Methods: The Family Life, Activity, Sun, Health and Eating Study is a U.S.-based study of parent-adolescent dyads (12-17 years; $n=1532$ dyads). Survey items were drawn from reliable, valid instruments, adapted for parents and adolescents across three obesity-related behaviors (fruit and vegetable intake; physical activity; and sedentary habits). Three parenting practices representing variations in parental involvement were assessed on a 5-point Likert Scale (parent makes the decision, parent makes sure the adolescent engages in the behavior, parent and adolescent make decisions together). Intraclass correlations assessed agreement between parent- and adolescent-perceptions of parental involvement (PPI). Multilevel modeling tested the unique contribution of parent and adolescent PPI on adolescents' diet and activity behaviors, controlling for adolescent age and sex.

Results: Agreement between parent- and adolescent PPI ranged from $r=0.33$ to $r=0.55$ ($ps < 0.001$). Both parent- and adolescent PPI were associated with adolescent fruit and vegetable intake. For every 1 unit increase in parents and adolescents making decisions together, adolescent fruit and vegetable consumption increased by 0.3 ($F=17.33$, $p < 0.0001$) and 0.42 ($F=38.45$, $p < 0.0001$), for parent- and adolescent PPI respectively. Only parental PPI was associated with adolescent physical activity. Parents who reported making decisions had adolescents who reported less physical activity ($\beta = -0.13$, $F=26.62$, $p < 0.0001$). Parent-adolescent joint decision making was associated with greater adolescent physical activity ($\beta = 0.08$, $F=7.51$, $p < 0.001$). Only adolescent PPI was associated with adolescent sedentary behavior (parent decides: $\beta = -0.06$, $F=7.04$, $p < 0.001$; parent makes sure: $\beta = -0.05$, $F=4.64$, $p=0.03$; parent-adolescent decide together: $\beta = -0.07$, $F=8.91$, $p < 0.01$).

Conclusions: This study examined the unique contribution of parent and adolescent PPI to adolescent obesity-related behaviors, illustrating how each are uniquely associated with adolescent diet and physical activity behaviors. Future research should account for the interdependence between parents and adolescents and utilize a dyadic approach when possible.

SO5.4.3

Lessons learned from the AFLY5 RCT process evaluation: Implications for the design of physical activity and nutrition interventions in schools

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Background: Systematic reviews have highlighted that school-based diet and physical activity (PA) interventions have had limited effects. This study used qualitative methods to examine how the effectiveness of future primary (elementary) school diet and PA interventions could be improved.

Methods: Data are from the Active For Life Year 5 (AFLY5) which was a cluster RCT conducted in 60 UK primary schools. Year 5 (8-9 years of age) pupils in the 30 intervention schools received a 12-month intervention. At the end of the intervention period, interviews were conducted with: 28 Year 5 teachers (including 8 teachers from control schools); 10 Head-teachers (6 control); 31 parents (15 control). Focus groups were conducted with 70 year 5 pupils (34 control). Topics included how the AFLY5 intervention could have been improved and issues around how school-based diet and PA interventions should optimally be delivered. All interviews and focus groups were transcribed and thematically analysed across participant groups.

Results: Analysis yielded four themes. Child engagement: Data suggested that programme success is likely to be enhanced if the children feel that they have a sense of autonomy over their own behaviour and if the activities are practical. School: Finding a project champion within the school would enhance intervention effectiveness. Embedding diet PA content across the curriculum and encouraging teachers to role model good diet and PA behaviours were seen as important. Parents and community: Encouraging parents and community members into the school was deemed likely to enhance the connection between schools, families and communities, and "create a buzz" that was likely to enhance behaviour change. Government / Policy: Data suggested that there was a need to adequately resource health promotion activity in schools and to increase the infrastructure to facilitate the teaching of diet and PA lessons.

Conclusions: Future primary school diet and PA programmes should find ways to increase child engagement in the programme content, identify programme champions, encourage teachers to work as role models, engage parents and embed diet and PA behaviour change across the curriculum. However, this will require adequate funding and cost-effectiveness will need to be established.

SO5.4.4

Findings From The Active For Life Year 5 (AFLY5) School-based Cluster Randomised Controlled Trial To Increase Physical Activity, Reduce Sedentary Behaviour and Increase Fruit and Vegetable Consumption

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Aim: To investigate the effectiveness of a school-based intervention to increase physical activity, reduce sedentary behaviour, and increase fruit and vegetable consumption in children.

Background: There is some evidence from mainly poor quality trials that school-based interventions are effective at increasing physical activity, reducing sedentary behaviour and increasing fruit and vegetable consumption.

Methodology: Active For Life Year 5 (AFLY5) was a school-based, cluster randomised controlled trial. AFLY5 consisted of teacher training, 16 lessons and 10 parent-interactive homeworks and materials. The intervention was based on social cognitive theory with a particular emphasis on improving children's self-efficacy to make behavioural change. AFLY5 was delivered in school Year 5 (aged 9-10) in two areas of England (Bristol and North Somerset) during one academic year. The primary outcomes were accelerometer minutes of moderate to vigorous physical activity (MVPA) and sedentary behaviour per day, and reported daily consumption of servings of fruit and vegetables. Baseline assessments were undertaken at the Year 4 or early in Year 5. Outcome assessment was completed at the end of year 5.

Results: 60 schools with more than 2221 children were recruited. None of the three primary outcomes differed between intervention and control groups. The difference in means comparing the intervention group with the control group was -1.35 (95% CI -5.29 to 2.59) minutes per day for MVPA, -0.11 (-9.71 to 9.49) minutes per day for sedentary behaviour, and 0.08 (-0.12 to 0.28) daily servings of fruit and vegetable. The intervention was effective for three out of nine of the secondary outcomes after multiple testing: self-reported time spent in screen viewing at the weekend (-21 (-37 to -4) minutes per day), self-reported servings of snacks per day (-0.22 (-0.38 to -0.05)), and servings of high energy drinks per day (-0.26 (-0.43 to -0.10)) were all reduced.

Conclusions: The findings suggest that AFLY5 is not effective at increasing physical activity, decreasing sedentary behaviour, or increasing fruit and vegetable consumption. Change in these activities may require more intensive behavioural interventions with children or upstream interventions at the family, societal and school levels.

SO5.4.5

Physical activity patterns across SLOTH domains in children

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: To better inform health promotion strategies our study aimed to identify how children allocate their active time in the different domains.

Methods: 374 children (mean age 12) wore an accelerometer and a GPS on opposite sides of the waist for 7 consecutive days. PALMS software were used to combine GPS and accelerometer data and categorized active (>100cpm) and MVPA (>2295cpm) time. GIS allocated activity time into 4 domains: school, leisure, transport and home.

Results/findings: The proportion of time spent in activity were higher in leisure domain (35.5%) followed by school (29.9%), transport (27.5%) and home (7%) domains. However higher proportion of time in MVPA bouts of at least 10 minutes were found in the transport domain (43.6%), school (29.2%), leisure (20.5%) and home (2.9%).

Differences between genders were found for the proportion of time spent in both active and MVPA time across domains. Girls spent significantly more time in transport (29%) than boys (26%); and boys allocated more active time in school domain (32%) when compared to girls (28%). Looking at the proportion of time spent in MVPA bouts significant differences ($p < 0.005$) were observed in all domains except home. Girls (51.8%) had significantly more MVPA than boys (34.1%) in the transport domain, whereas boys spent more of their MVPA bout time in school (35.9%) and leisure (24.2%) when compared to girls (23.5% and 17.2, respectively).

Conclusions: Overall, transport domain emerged as the most important contributor to MVPA, so interventions and policies aiming to increase this regular behavior may be of particular relevance in children. Strategies should consider gender differences when targeting each domain.

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SO5.4.6

School-time allocation for breaks and PE, and physical activity levels in 5-6 year old children.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Opportunities exist within schools to increase levels of children's physical activity (PA), yet there is little evidence of the impact of school PA policies on children's health, and strong evidence that interventions to increase PA in children have only small effects. Some researchers have suggested that increases in PA at school are compensated for by less PA out of school. This study aims to investigate the relationship between school-time allocation for breaks and physical education (PE), and PA levels in 5-6 year old children, within and outside of school.

Methods: We used baseline data from 913 children from 50 primary schools in the West Midlands region of England participating in the WAVES childhood obesity prevention trial. PA was measured using accelerometers worn for up to 5 days, and time for school PA opportunities was identified through a school questionnaire. Initial analyses examined PA levels in and out of school in relation to school time for PA. Random effects multilevel models were used to look at associations adjusted for sex, ethnicity and deprivation.

Results: In adjusted models, children attending schools with more breaktime have significantly greater levels of PA (β 0.21 (0.01, 0.40) $p=0.04$) and moderate-vigorous PA (MVPA) (β 18.39 (2.04, 34.73) $p=0.03$) within school (for every extra hour of breaktime at school, MVPA increased by 18 minutes). When split by gender, the significant associations exist only for boys. For PE time, adjusted models show no significant associations with PA or MVPA levels. However, when split by gender, there is a significant association for school-time MVPA levels in boys (β 10.67 (1.29, 20.05) $p=0.03$). There are no significant associations between school PA opportunity and non-school time PA or total PA.

Conclusions: Opportunities for PA at school are associated with higher PA levels among children in school time, particularly in boys. No strong evidence was found to support the hypothesis of compensation for increased in school PA through less PA out of school, or vice versa. The findings suggest that increasing school breaktime could be an effective way to increase the PA and MVPA levels of children.

SO5.4.7

Starting as we mean to go on: building knowledge translation and exchange into a School Health Research Network in Wales.

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SIG: Yes, Early care and education

Awards: No

Purpose: The School Health Research Network brings together schools, policy-makers, practitioners and researchers to co-produce research evidence on school-based health improvement and facilitate knowledge translation and exchange (KTE) to support evidence-based practice. Strategies to build KTE into the Network have been implemented from the outset as KTE is seen as a prerequisite to robust research as well as a dissemination activity.

Methods: A policy-practice-research partnership was created between two Welsh universities, Welsh Government, Public Health Wales, a cancer charity and a Health Board. Secondary schools participating in the Health Behaviour in School-aged Children Survey were invited to join the Network and offered evidence-based feedback reports based on their students' data, including physical activity, active travel and nutrition. Development of Network structures and processes, including those to facilitate KTE, then began in collaboration with schools, partners and other stakeholders. In particular, collaboration with the well-established national school health infrastructure (the Welsh Network of Healthy School Schemes, WNHSS) was sought to ensure the Network was compatible with WNHSS and responsive to their research and data needs.

Results: Schools welcomed the feedback reports and identified various uses for them, including teaching, student voice and parent engagement. They were supportive of regular cycles of student health and wellbeing data collection and have determined its frequency (biennially). Communication channels for KTE between schools, partners and other stakeholders have been established and continue to be developed, e.g. targeted newsletters, meetings. A process to take forward ideas for research has been instigated. This involves identification of policy-makers, practitioners and academics to form a committed team (a research development group, RDG) around the research idea and support during proposal development and study implementation. WNHSS have supported the Network and closer, ongoing collaboration is being explored.

Conclusions: KTE is still being developed within this young Network, but valuable experiences can already be shared. Feedback reports are a promising KTE tool with potential to engage the school community with data and research. RDGs are likewise a potentially powerful means to co-produce research evidence that is robust and timely. Close collaboration with WNHSS will further enhance KTE capacity within the Network.

SO5.4.8

Advancing Knowledge Translation and Exchange in School Health Research

Elizabeth Waters
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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: fun n healthy in Moreland! was a 5 year cluster randomized controlled trial in an inner urban area of Melbourne, where we sought to examine the effectiveness of an intervention which engaged schools through evidence and a strategic approach to developing strategies based on type 1 and 2 evidence (epidemiology and intervention evidence) and a vision for sustainable change. This presentation will focus on the integration of a knowledge translation approach: push, pull and exchange, and the mapping of intervention implementation over core obesity prevention elements: physical activity, food and nutrition, mental health and wellbeing. The community comprises over 170 languages and cultures, with a strong focus on food and celebration, but relatively socioeconomically disadvantaged.

Methods: 23 schools comprising over 8000 students, with a part time community development worker, participated, using strong theoretical frameworks including the WHO Health Promoting School Framework, Cultural Competency, Diffusion of Innovation, Socio-cological theory and Whitehead inequalities. Intervention Monitoring Tools, Capacity Assessment Rating, and assessment of the level of investment, were used alongside conventional parent and child questionnaires, lunchbox and environment monitoring.

Results: We demonstrated the time required to move from awareness raising to embedding policies within the school context, achieving improvements in nutrition and physical behaviours, policies, school environments, parent participation and sustainability of strategies within the school environmental context. Feedback on the value of a focus on evidence, and its contribution to catalyzing change, and the achievable cost of the program, was provided by principals, staff and parents-alike.

Conclusions: fun n healthy in Moreland! was the first large scale community wide cluster RCT, that focused on the needs, capacity, complexity and cultural richness of individual schools and worked with them to devise solutions to health and education outcomes, using a low resource, but evidence-based and community development approach. 10 year outcomes will be discussed and recommendations for ways in which Knowledge Translation and Exchange approaches can be embedded for sustainable change.

SO6.4. SHORT-ORAL:

Diet and nutrition in children and adolescents

SO6.4.1

The 'Growing Grandchildren' project: Reducing cancer risk factors when grandparents care for grandchildren

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SIG: Yes, Cancer Prevention and Management

Awards: No

Objective:

Seven million grandparents look after their grandchildren every week, with around 44% of children regularly looked after by grandparents. Tensions have been identified around divergent child-rearing practices in relation to cancer risk factors, particularly diet, which may limit the positive experiences that are to be gained from multi-generational parenting. Despite grandparents' increasing role in caring for grandchildren, there has been little intervention work targeting grandparents. The aim of this study is to use the MRC's framework for complex interventions to rigorously develop a logic model to examine the impact of grandparents' child-rearing practices on their grandchildren's risk factors and to design an intervention.

Methods:

We carried out a structured literature review to identify grandparents' child-rearing practices that might impact on their grandchildren's risk factors. We searched four databases (Web of Knowledge, Medline, Embase and Psycinfo) and grey literature using relevant search terms. Explicit inclusion/exclusion criteria helped to identify key literature, and we used a mixed-method approach to synthesise findings from multiple study designs. We also interviewed parents and grandparents living in areas of high deprivation (n=30) about the challenges of divergent child-rearing practices relating to cancer risk factors. Key stakeholders working with families, including academics, social workers, and NHS staff were also interviewed (n=10). Data was analysed thematically using Atlas.ti.

Results:

Within the structured review the majority of papers were focused around diet, and findings suggested that grandparents were more likely to provide children with high sugar diets, and encouraged children to overeat. Parents reported frustration with grandparents' dietary practices. The review highlighted further that interventions around grandparents have not been widely developed. Interview findings focused around the important role grandparents provided in relation to childcare, practices in relation to diet that undermined healthy eating recommendations, and strategies that parents and stakeholders used, or failed to use, to negotiate with grandparents around these issues.

Conclusions:

We are using the findings from the review and interviews to develop a logic model and evaluation plan that clearly maps out the scope of an intervention with families aimed at reducing practices that increase long term cancer risk in children.

SO6.4.2

Underreporting and its determinants among European adolescents: results from the HELENA study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Misreporting of food intake, including underreporting, is a major concern when addressing diet-disease associations and remains a key limitation of self-reported dietary intake. Underreporting and its determinants, however, have been scarcely investigated in adolescents. Therefore, this study aims to examine the prevalence of underreporting in adolescents and to investigate associated determinants.

Methods: Two self-administered computerized 24-hour dietary recalls (24-HDR) were obtained from 2,330 adolescents aged 12.5-17.5 across eight European countries (Austria, Belgium, France, Germany, Greece, Italy, Spain and Sweden). Objective measures of height and weight were obtained. Participants' body mass index was categorised according to Cole/IOTF cut-offs. Parental education, socioeconomic status (SES), total screen time, sleeping behaviours and dietary habits were collected via self-administered questionnaires. Adapted Goldberg cut-offs were applied to identify underreporters. Associations between underreporting and covariates were investigated by multilevel logistic regression analyses after adjustments for age, sex and center.

Results: The degree of underreporting was significantly higher for the second 24-HDR than for the first one (24.9% vs. 22.4%). When considering mean of the two days, 24.9% of the adolescents were categorized as underreporters. The risk of underreporting increased with age (OR=1.13, 95%CI=1.04-1.22) and with lower sleep duration (OR=0.91, 95%CI=0.83-0.99). Overweight (OR=3.95, 95%CI=3.08-5.05) and obese (OR=6.59, 95%CI=4.36-9.94) adolescents were more likely to be underreporters than normal-weight adolescents, whereas underweight adolescents tended to underreport less often (OR=0.51, 95%CI=0.30-0.87). Underreporting was significantly higher in males and among those adolescents who often skipped breakfast. No significant associations were observed with parental education, SES and total screen time.

Conclusions: Underreporting seems to be influenced by adolescents' characteristics, specifically age, sex and weight status, and dietary and sleeping behaviours. These results, however, do not confirm previous findings suggesting higher degree of underreporting among people from lower SES. It should be borne in mind that adolescents reporting low energy intake may reflect attempts to lose weight corresponding to real undereating rather than underreporting. Nevertheless, these results may have implications for the interpretation of studies of diet and comorbidities among adolescents. Factors influencing underreporting should be identified in young populations to improve study designs and the interpretation of potentially biased findings.

SO6.4.3

Child involvement in home meal preparation and its associations with diet quality

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SIG: Yes, Children and families

Awards: No

Purpose:

A better understanding of meal preparation behaviors and its associations with dietary intake is essential to inform health promotion strategies. This presentation describes findings from a provincially representative survey examining the extent to which children were involved in meal preparation at home, and its associations with diet quality.

Methods:

In 2010 and 2014, over 3,000 children (age 10-11 years) and their parents from approximately 140 elementary schools were surveyed each year. Children were asked how often they helped to prepare or cook food at home, while parents were asked if they encouraged their child to help choose and prepare meals. Child diet quality was measured using the Diet Quality Index - International (DQI-I) calculated based on self-reported dietary intake in the Harvard Youth/Adolescent Food Frequency Questionnaire. Data were analyzed using random effects models with children nested within schools.

Results:

More than half of the surveyed children reported helping with home meal preparation, with 62.9% and 67.2% indicating that they helped at least once a week in 2010 and 2014 respectively. In both survey years, children who helped prepare meals at home more frequently had better diet quality, ate more daily servings of vegetables and fruit, and ate more calories. The survey also showed that most parents (67%) often encouraged their children to help prepare meals. Children receiving parental encouragement were more likely to be involved in meal preparation.

Conclusions:

Encouraging increased involvement in home meal preparation could be a viable health promotion strategy to improve diets among children. These findings suggest that parents are an important target of these strategies as children are more likely to be involved in home meal preparation when parents encourage and support these habits. Participation in meal preparation may be instrumental in fostering an increased interest in food and nutrition among children, and presents a key opportunity for parents to role model healthy eating behaviors and to encourage their child to try and enjoy different foods.

SO6.4.4

Child fat-free mass predicts energy intake independent of the response to increasing portion size

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Increases in portion size lead to increases in energy intake in children and adults, an effect known as the portion size response (PSR). We hypothesized that some children would respond more strongly to portion size manipulations than others, which may be related to differences in body composition. Previous research has implicated fat-free mass (FFM) as a key driver of appetite regulation and energy balance, but its relationship to PSR has not been studied. The objective of this preliminary analysis was to test the association between child body composition and PSR.

Methods:

Children (n=38, 7-10 years) ate 4 ad libitum meals of common foods (pasta, garlic bread, cake, broccoli, tomatoes, grapes) that varied in portion size (100% reference, 133%, 167%, 200%) and were randomized across 4 weeks. Body weight (kg) was measured on a standard scale. Percent body fat was measured using bioelectrical impedance analysis (Tanita) and used to calculate absolute fat mass (FM) and FFM (kg). Data were analyzed using linear mixed models to predict intake (kcal) across repeated measures, with portion size as the fixed factor. Covariates included child age, sex, and either FM or FFM.

Results:

There was a significant main effect for portion size condition; energy intake increased with increasing portion size ($p<0.01$). There was a 102 kcal (21%) average increase in intake from the 100% to the 200% portion. When analyzed in separate models, both FM and FFM were positively associated with intake ($p<0.01$ for both), independently of portion size condition. However, when analyzed in the same model, only a main effect for FFM remained significant ($p<0.05$). No interaction effects for PSR arose from the models.

Conclusions:

Increasing the size of portions at a multi-item meal increased energy intake. Although both FM and FFM were positively associated with energy intake, PSR did not vary as a function of body composition. FFM was a better predictor of energy intake than FM, regardless of portion size served. Overall, this research lends support to the literature on FFM as an appetitive driver. A larger sample is needed to determine whether FFM alters the response to portion size manipulations.

SO6.4.5

Vegetable preference in 4th grade children is coupled with cooking and food related attitudes and behaviors but not vegetable availability in the home

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SIG: Yes, Children and families

Awards: No

Purpose: Examine the relationship between parent reported in-home vegetable availability (VA), vegetable preference (VP) of 4th grade children and cooking-related attitudes and practices.

Methods: Baseline measures from tested/validated instruments were collected from 2 cohorts (8 schools, 22 classrooms) in subsequent academic years participating in an impact study of a year-long classroom-based cooking program and parent/family-based enrichment experiences based on Experiential Learning Theory. Students (n=762) completed an in-class survey of attitude toward cooking (AT), self-efficacy related to cooking (SE), and VP; heights/weights were measured. Parents (n=219) responded to online modeling, self-efficacy/outcome expectancy (SE/OE) measures of vegetable-linked behaviors, and VA in the home; height/weight were self-reported. Survey response options were summed for analyses that included correlation, means testing, linear regression and cluster analysis.

Results: Students (49% female) were mostly white (75%), of normal weight (mean BMI z-score 0.24 ± 1.1) with representative survey scores. Scores did not differ by parent participation status. Parents were female (85%), white (91%; 11% Hispanic), highly educated (65% college degree or higher), not obese or food insecure with typical survey scores. VP and VA were not related to school, teacher, cohort, BMI or gender. Child VP was related to their cooking AT and SE (both P<0.001), parent modeling and SE/OE, but not VA. When controlling for child gender, VP and VA were correlated (P=0.049) but r was .14. Children who cooked (in general, with friends, or with family) had greater VP (all P<0.001); VA was not related to child cooking experience. VP was significantly predicted by parent SE/OE (11%) and modeling (9%) but not by home VA. Cluster analyses with VA, VP, and vegetable-related behaviors revealed vegophilic (n=168) and vegophobic (n=26) clusters. Important cluster predictors were parent expectancies that children would eat vegetables if included in a meal or purchased; VA was the least important cluster predictor.

Conclusions: Child VP is related to both parent and child cooking and food related attitudes and behaviors. Home VA is related to parent eating and food selection behaviors, but not child VP. To enhance child VP, interventions that encourage child cooking practices, parent SE/OE and/or modeling opportunities are suggested.

SO6.4.6

Can rewarding healthy food choices induce changes into adolescents' snacking? The development of the REWARD serious game

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose: As high intake of energy-dense snacks is common in adolescents and has been related to overweight, the REWARD-project aims to develop and evaluate an intervention focusing on improving adolescents' snacking patterns. Since healthy nutrition promoting strategies used until now had limited effects, the REWARD-project proposes a paradigm shift: the development of an innovative framework to facilitate healthy food choices in adolescents by introducing the concept of reward sensitivity (RS) and focusing on the reward value of food, food environment and eating behavior.

Methods: A reward-based serious game intervention to retrain adolescents to opt for healthy food choices in the current obesogenic environment is being developed. The intervention is developed according to the stepwise and iterative principles of the Intervention Mapping Protocol and included an intensive participatory approach with several significant stakeholders throughout all phases of the intervention development.

Results: Preliminary studies informing this intervention development were 1) a large-scale cross-sectional study on dietary and game behaviours and its individual and environmental determinants among 1100 Flemish adolescents, 2) focus group research with 100 adolescents to brainstorm about the conceptual model of the serious game, and 3) experimental research to investigate how non-food reward schemas can compete with the rewarding character of palatable foods in adolescents. In contrast to earlier interventions which mostly focused on determinants, the current intervention will be based on the dual process model incorporating strategies to influence both the automatic pathway (i.e., operant learning theory) and the conscious pathway (i.e., a focus on certain determinants). The central idea of the intervention will be that participants will earn credits in the game when scanning healthy (rather than unhealthy) snacks which will influence the advancement of the players in the game. This credit system will be related to the dietary quality index of the consumed snacks.

Conclusion: When this paradigm shift towards reward sensitivity as a basis for adolescents' behavioural change proves to be successful, it will offer a new scientifically-based vision for public health and health promotion (i.e., incorporation of learning theories in intervention programs as well as tailored content of these programs based on individual RS differences).

SO6.4.7

The relation of maternal internalizing problems during pregnancy and postpartum with children's fussy eating. The Generation R Study.

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Abstract:

Objective: The aetiology of fussy eating is not well understood. We aimed to examine the association between maternal internalizing problems and child food fussiness.

Methods: This study was embedded in the Generation R Study, a prospective birth cohort in the Netherlands. A total of 3550 mother-child dyads were included. Maternal symptoms of anxiety and depression were assessed with the Brief Symptoms Inventory during pregnancy and postpartum at two months and three years. Mothers filled out the food fussiness scale of the Child Eating Behaviour Questionnaire when children were four years old. Also, we used maternal and paternal reports on two Child Behavior Checklist (CBCL) items as a proxy for fussy eating at age three. Regression analyses were performed, adjusting for potential confounders such as socio-demographics.

Results: Higher maternal anxiety symptoms during pregnancy were related to an increased food fussiness score in children even after adjustment for depressive symptoms (0.47 points per 1-SD anxiety score, 95% CI: 0.23; 0.75). Likewise, higher anxiety scores at two months postpartum were associated with higher food fussiness scores after adjustment for depressive symptoms (0.31 points per 1-SD anxiety score, 95% CI: 0.02; 0.60). Maternal anxiety symptoms were also associated with paternal reports of child fussy eating on the CBCL (e.g. in prenatal models OR= 1.17, 95% CI: 1.09; 1.28 reported by fathers). However, maternal depressive symptoms were not associated with fussy eating if we adjusted for maternal anxiety.

Conclusions: Maternal anxiety, especially during the prenatal and early postpartum period, should be considered as a potential risk factor for children's fussy eating. Future research should focus on potential mechanisms as fussy eating might be an expression of children's behavioural inhibition.

SO6.4.8

Design and evaluation of a context-based programme to promote healthier eating practices in Scottish children.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Scottish children eat high sugar and low fruit and vegetable diets. In 2010, a new curriculum was introduced with specific food and health outcomes for key stages. School-based interventions to improve children's diets have been widely trialled, however, many focus on individual level influences, and ignore the context in which eating practices occur. With this in mind, the objective of this study was to use the Medical Research Council's framework for developing complex interventions to design a context-based programme to promote healthier eating practices in children, and evaluate its feasibility.

Method:

We developed an intervention using a sociological approach (structuration theory) and findings from a systematic review, ethnographic work and interviews with parents, teachers and children. The intervention was aimed at 11-12 year old Scottish children. It included classroom-based and homework exercises, practical cooking sessions, teacher training and the distribution of water bottles. Four schools were randomised to intervention or control conditions: two from areas of high deprivation and two from areas of low deprivation. Outcomes included: percentage energy from added sugar, fat and saturated fat, fruit and vegetable intake, and frequency of unhealthy drinks and snacks, measured using an online 24-hour recall and a food frequency questionnaire at baseline, 8 weeks and post-intervention. Change was tested for continuous outcomes through linear mixed models. Children and teachers provided written and verbal feedback on the intervention.

Results:

Fifty-three children were in the intervention group, and 84 in the control group. Study retention was high with 90% of children completing measures at all three timepoints. The intervention was highly valued by children and teachers, but more time was required to deliver it. The outcome evaluation suggested the intervention reduced children's frequency of unhealthy snack consumption, and there were promising results for reduced frequency of unhealthy drinks. Other outcomes were not improved.

Conclusion:

Despite an elevation of food as an important area of learning within the curriculum, changing eating practices presents a major challenge. Findings to take forward are that interventions are feasible, changes outside the classroom environment are challenging, and further validation of the measurement tool is required.

SO7.4. SHORT-ORAL: Healthy eating at school and at home

SO7.4.1

MOTIVATORS, BARRIERS AND BENEFITS OF FAMILY MEALS WITH YOUNG CHILDREN IN AUSTRALIA

Alison Spence, Karen Campbell
Centre for Physical Activity and Nutrition Research, Deakin University, Vic, Australia

SIG: Yes, Children and families

Awards: No

Objective:

Family meals are likely to be an important influence on diets, and therefore a relevant setting for nutrition promotion, but little is known about young children's family meals. Informed by social cognitive theory, this study's aim was to investigate parents' motivators and barriers for having family meals with young children, which have not been previously assessed. Additionally, associations between family meals and children's diets were investigated.

Methods:

Using an innovative recruitment strategy, parents of young Australian children (aged six months to six years) were invited through websites and blogs to complete an online survey. Over three months, cross-sectional data was collected using purpose-designed measures informed by the literature. Logistic and ordered logistic regression analyses were conducted.

Results:

Preliminary analysis of data from 992 parents showed 92% viewed family meals as important, with most agreeing they are a time to promote healthy child eating (92%) as well as social behaviours (91-95%). The most common influences when choosing foods for meals were 'choosing food that is healthy for the family' (97%), and 'choosing food that my child likes' (89%). Respondents generally enjoyed family meals (95%), and many wanted to eat together as a family more often (44%). However, 33% reported family meals were sometimes a setting for disagreements, and 39% reported difficulty finding time to eat together, with working hours being a common challenge.

Parents more frequently eating the same food as their child at dinner was associated with serving more types of vegetables at family meals (OR 2.86, CI 2.16-3.78) and higher child usual vegetable intake (OR 1.60, CI 1.21-2.11). Children more frequently watching TV while eating was associated with higher intakes of discretionary snack foods (OR 1.12, CI 1.09-1.15).

Conclusions:

Online recruitment and survey conduct was a successful strategy for this target group. Frequency of family meals is motivated by both nutrition and social factors, but parents face a number of challenges in facilitating family meals. Parents and children eating the same foods at mealtimes, and children watching TV at mealtimes, are likely to be an important influences on child nutrition and hence relevant targets for nutrition promotion.

SO7.4.2

Food for Thought: Evaluation of a Nutrition Curriculum in Afterschool Programs

Rebecca Kyryliuk, Jessica Chandler, Michael Beets, Jessica Jones, Annie Grove
University of South Carolina, Columbia, SC, USA

SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: In hundreds of afterschool programs (ASPs) in the United States, resources have been invested in implementing health curricula. The purpose of this study was to conduct the first evaluation of a widely-disseminated nutrition curriculum in terms of improving dietary knowledge, self-efficacy to consume fruits and vegetables (F&V), and snack preferences of children attending the ASPs.

Methods: Using a randomized controlled design, pre-and post-measures were taken on 389 children (43.7% female, mean age = 7.4 ± 0.1 yrs) from four ASPs (2 intervention/2 control). Food knowledge was measured on 3rd-5th graders using an adapted validated survey. The Child Self-Efficacy Scale was used to measure self-efficacy to consume F&V for 3rd-5th graders. All children were offered one choice from 5 F&V (snack1) and one choice from 14 snacks, including F&V and less healthful alternatives (snack2). Snack selection and consumption were compared. Mixed-method regressions, controlling for ASP and time, were used to determine the impact of the curriculum on the outcomes.

Results: Food knowledge significantly improved for children in intervention (N=40, mean improvement = 2.2 ± 11%) compared to controls (N=36, mean improvement = 0.0 ± 9%) (p=0.05, CI=-0.001,0.177). Self-efficacy did not significantly improve for children in intervention (N=35, mean improvement = 8.3 ± 18.7%) compared to controls (N=35, mean improvement = 4.6 ± 27.5%) (p=0.56, CI=-0.14,0.26). When offered both F&V and less healthful options at post-test, choices did not significantly differ for children in intervention (N=112, 11.6% F&V) compared to controls (N=128, 7.2% F&V) (p=0.57, CI=-1.48,2.65). When offered only F&V, consumption did not significantly differ between children in intervention ASPs compared to control ASPs.

Conclusions: These results indicate that the resources spent implementing this nutrition curriculum might be better spent on serving only F&V, as most children consumed these when offered alone. The age-inappropriateness of this curriculum could have contributed to its lack of effectiveness. And ASPs may not be appropriate settings, as the children prefer to play.

SO7.4.3

Modifying the design of Nutrition Facts tables to improve young people's ability to interpret, compare, and manipulate nutrition information.

Erin Hobin^{1,2}, David Hammond², Gail McVey³, Christine White², Mary O'Brien¹, Judy Sheeshka⁴, Heather Manson¹
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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: To experimentally test the efficacy of modifications to the NFT in Canada on adolescents and young adults' ability to interpret, compare, and manipulate nutrition information.

Methods: An online survey was conducted among 2010 adolescents and young adults (ages 16 - 24) across Canada. Using a between-groups design, participants were randomly assigned to one of six NFT conditions. The NFT conditions were based on a 2x3 factorial design. Current NFT serving size regulations in Canada, which allow manufacturers to determine serving size information were compared to alternative formats listing «standardized» serving sizes across similar food products, and formats for interpreting % Daily Value information on NFTs by including simple «HIGH / MED / LOW» descriptors and/or colour coding. The standardized serving size amounts were based on Canada's Food Guide serving recommendations. Criteria used for categorizing % Daily Values were consistent with Health Canada's recommendations, where ≤5% of a nutrient is 'Low' or green, and ≥15% is 'high' or red. The formats for interpreting % Daily Value information tested were applied to calories and negative nutrients only. The NFTs were displayed on actual crackers boxes, and the nutritional values displayed on the NFTs were similar to actual cracker brands. To assess ability to interpret, compare, and manipulate nutrition information, participants completed a survey with performance tasks based on the NFT displayed on boxes of crackers. Differences in the ability to interpret, compare, and manipulate nutrition information was assessed across experimental conditions using Poisson regression models including an indicator variable for «condition» and adjusting for covariates.

Results: Participants in the NFT conditions with simple descriptors and colour coding for the % Daily Value information were more likely to correctly interpret nutrition information. When comparing nutrition information on NFTs between two boxes of crackers, participants exposed to NFTs with standardized serving sizes were more likely to accurately choose the healthier product. Including both standardized serving sizes plus simple descriptors had a modest effect on participants' ability to manipulate information on the NFTs.

Conclusion: Standardized serving sizes, and simple descriptors or colour coding improves ability to interpret, compare, and manipulate nutrition information on NFTs.

SO7.4.4

School Lunch Salad Bars, their Placement, and Students' Fresh Fruit and Vegetable Consumption

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 Arizona State University, School of Nutrition and Health Promotion, Phoenix, AZ, USA

SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: The school lunches are a key avenue for increasing children's consumption of fresh fruits and vegetables (F&V). School salad bars are encouraged as a strategy to increase consumption of F&V in the U.S.; however, there is minimal research examining the prevalence, contextual factors, and the effectiveness of salad bars in promoting F&V consumption among students in the U.S. or other countries.

Methods: This presentation will discuss results from two cross-sectional studies conducted in Arizona, USA: (study 1) a survey assessing prevalence and predictors of school salad bars (N=653 primary and secondary schools); (study 2) a plate waste study of 6 secondary schools (N=533 students) in which salad bar placement differed between schools (3 with salad bars inside vs. 3 with salad bars outside of the serving line). In study 2, negative binomial regression models regressed amounts of F&V consumed onto salad bar placement, adjusting for gender, grade, race/ethnicity, socio-economic status, day of the week, and nesting of students within schools.

Results: Based on study 1, 62.0% of schools currently had a salad bar; 27.4% never had one, and 10.6% had one in the past; approximately 3 out of 4 schools with a salad bar placed it outside the serving line, with secondary schools least likely to place salad bars outside the line (p<0.001). In study 2, students at schools with salad bars inside the serving line had greater odds of consuming any F&Vs compared to students in schools with salad bars outside the line (adjusted OR=4.83; 95% CI 3.40 – 6.81). On average, students with the salad bar outside the line wasted less F&Vs compared to those with salad bars inside the line (30% versus 48%, respectively).

Conclusions: A majority of schools used salad bars to promote F&V consumption, and the majority of those schools placed salad bars outside of the serving line. However, salad bars inside the serving line resulted in both greater fresh F&Vs consumed and wasted. Implications of these results suggest that salad bar placement is an important contextual variable that influences students' F&V consumption.

SO7.4.5

Nutrient Quality of Preschooler's Lunches as Measured by Dietary Reference Intakes and Acceptable Macronutrient Distribution Range.

Sara Sweitzer¹, Maria Romo-Palafox¹, Nalini Ranjit², Courtney Byrd-Williams², Cindy Roberts Gray³, Deanna Hoelscher²
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SIG: Yes, Early care and education

Awards: No

Objective:

The purpose of this study was to evaluate the nutrient quality of lunches packed by parents for their preschool aged child using the Dietary Reference Intakes (DRI) and the Acceptable Macronutrient Distribution Range (AMDR).

Methods:

Baseline data from the «Lunch is in the Bag» cluster randomized controlled trial in Central Texas was included in this study. Serving sizes of foods packed by parents and the subsequent amount consumed by children were observed and recorded for two non-consecutive days. The Food Intake Analysis System (FIAS) was used to code and calculate the nutrient contents food records. The mean values for energy, macronutrients, sugar, dietary fiber, and select micronutrients were estimated with three-level regression models that controlled for central-level clustering, and repeated measures for each child; all models were adjusted for child age, sex and BMI.

Results:

Baseline data for 607 parent-child dyads from 30 early care and education centers were collected. Mean and SE for energy (kcal) was 602.48 ± 11.70 for packed lunches compared to 374.40 ± 11.70 of consumed lunches. Percent of energy as macronutrients for protein, carbohydrate and total fat were within the accepted AMDR range for the children's ages, 14.8%, 55.9% and 31.2%, respectively. Sugar at 28.9% of energy was above the AMDR recommendation of <25% of calories. Only 24.49% of parents packed 33% of the child's DRI for dietary fiber and only 51.7%, 53.8% and 11.9% packed 33% of the DRI for Vitamin A, calcium and potassium, respectively.

Conclusion:

The dietary quality of preschooler's lunches that are packed by their parents are not consistently providing adequate nutrients. Preschool children rely on the parents to present them with healthy food choices. These findings offer some key points to utilize for future parent education.

SO7.4.6

Do Parents React to their Adolescent Child's Weight Status or their Own Weight Status when Using Parent Feeding Practices?

Jerica Berge, Craig Meyer, Katie Loth, Rich MacLehose, Dianne Neumark-Sztainer
 University of Minnesota, Minneapolis, USA

SIG: Yes, Children and families

Awards: No

Objective: Prior studies have examined the independent influence of mother's weight status or child's weight status on a parent's use of feeding practices in the home environment. However, studies have not examined the mutual influence of parents' and adolescents' weight status on parents' feeding practices. Additionally, examining the influence of a second caregiver's weight status would address whether parents' feeding practices are similarly influenced by their child's or their own weight statuses. This study examines parent/adolescent weight status concordance (i.e., parent/adolescent same weight status) and discordance (i.e., parent/adolescent different weight statuses) in relation to parents' use of food restriction or pressure-to-eat feeding practices.

Methods: Data from two linked population-based studies, EAT 2010 (Eating and Activity in Teens) and F-EAT (Families and Eating and Activity in Teens), were used for cross-sectional analysis. Mothers and fathers (n = 3,163; 63% females; mean age = 42.6 years) and adolescents (n = 2,106; 54% girls; mean age = 14.4 years) were socio-economically and racially/ethnically diverse. Anthropometric assessments and surveys were completed at school by adolescents and surveys were completed at home by parents. Linear regression models were used to predict average food restriction and pressure-to-eat feeding practices by parent/adolescent weight status concordance or discordance. Additional sensitivity analyses were run with adolescents from two parent households.

Results: Parents used the highest levels of pressure-to-eat feeding practices when both parents and adolescents were not overweight (i.e., concordant) as compared to all other combinations of concordant and discordant parent/adolescent weight status categories. Additionally, parents used the highest levels of food restriction when parents and adolescents were both overweight (i.e., concordant) as compared to all other combinations of concordant and discordant parent/adolescent weight status categories. Sensitivity analyses with two parent households revealed similar patterns.

Conclusions: Results suggest that parents tailor their feeding practices when parents/adolescents are concordant on overweight status (i.e., use food restriction) or nonoverweight status (i.e., use pressure-to-eat). Results may inform health care providers and public health interventionists which parent/child dyads are at highest risk for experiencing food restriction or pressure-to-eat parent feeding practices in the home environment and who to target in interventions.

SO7.4.7

Dietary Quality of Parent Packed Lunches for Preschoolers as Measured by the Healthy Eating Index

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¹University of Texas at Austin, Austin, TX, USA, ²University of Texas School of Public Health, Austin, TX, USA, ³Third Coast Research Inc., Galveston, TX, USA

SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Purpose: The purpose of this study was to determine the dietary quality of lunches that parents pack for their preschool child using the Healthy Eating Index (HEI) 2010.

Methods: This study included baseline dietary data from the "Lunch is in the Bag" cluster randomized controlled trial in Central Texas, USA. Food packed by the parent and the amount of each item consumed by the child were recorded using an observation protocol for two non-consecutive days. The Food Intake and Analysis System (FIAS) was used to code and calculate the nutrient content of food records. HEI total and component scores of lunches packed and consumed were estimated with three-level regression models that controlled for central-level clustering, and repeated measures for each child; all models were adjusted for child age, sex and BMI.

Results/findings: Baseline data were collected for 607 parent-child dyads from 30 Early Care and Education centers. Mean and SE for HEI-2010 total scores were 58 + 0.9 and 52.3 + 0.9 out of a possible 100 points for lunches packed and consumed, respectively. Percent of lunches packed that adhered to the HEI-2010 requirements for each component were low for total vegetables (16.8%), greens and beans (7.5%), whole grains (26.4%), seafood and plant proteins (28.2%), saturated fat (24.7%), sodium (22.3%) and empty calories (51.7%). The overall dietary quality of the meals consumed by preschoolers was significantly lower ($p < 0.01$) than that of the meals packed, and lower component scores were evident for total vegetables, greens and beans, total and whole fruit, whole grains, dairy, total protein, and seafood and plant proteins, and for empty calories ($p < 0.01$).

Conclusions: The dietary quality of preschooler's packed lunches is not adequate when measured with the HEI-2010, resulting in poorer dietary quality of foods consumed. Parents need more information about guidelines for packing healthy lunches, as well as behaviorally-based programs to encourage packing of healthier lunches. It is vital to ensure that preschoolers receive meals with high dietary quality to promote their preferences for healthy diets.

SO7.4.8

Cross-cultural comparison of perspectives on healthy eating among Chinese and American undergraduate students

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Understanding views about what constitutes a healthy diet in diverse populations may inform design of culturally tailored behavior change interventions. While previous studies have examined views on healthy eating using qualitative methods, few studies have sought to compare these views in distinct groups of young adults. This study aimed to describe perspectives on healthy eating among Chinese and American undergraduate students and identify similarities and differences between the two groups.

Methods: Chinese ($n=55$) and American ($n=57$) participants composed one- to two-paragraph responses to the following prompt: "What does the phrase 'a healthy diet' mean to you?" Content analysis using qualitative data analysis software was applied to identify predominant themes. Three researchers independently coded each essay and then grouped codes with similar content. Themes representing the main messages conveyed in the essays were identified and then rearranged based on discussion among researchers.

Results: American students most commonly described healthy eating in terms of balance, both with regards to balancing food groups and balancing consumption with exercise. Physical activity was very often cited as an essential component of a healthy diet. While not as commonly reported, healthy eating was also said to be important for mental and spiritual health. Chinese students generally described a healthy diet as yielding desirable physical outcomes, such as maintaining immunity and preventing digestive problems. Other outcomes were also mentioned, such as feeling good and being happy as a result of healthy eating. Timing of eating was considered important, with regular meals emphasized, as well as larger quantities of food during the day than at night.

Conclusions: While both groups described healthy eating in terms of principles guiding current nutrition recommendations, several other themes also emerged, such as those relating healthy eating to psychosocial outcomes. Future studies may further examine themes that may not typically be addressed in nutrition education programs in diverse populations of young adults. Gaining greater knowledge of the ways in which healthy eating is viewed will allow for development of interventions that are sensitive to the traditional values and predominant views of health in various groups.

SO8.4. SHORT-ORAL:

Measurement of physical activity and sedentary behavior

SO8.4.1

A new approach for measuring the degree of implementation of school-based health promotion interventions

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Purpose

Although the importance of evidence-based programmes is widely recognized, such proven effective programmes often show disappointing effects during widespread dissemination. Since the public health impact of such programmes depends on their implementation in practice, it is important to understand if and to what extent a programme is implemented as intended. Therefore, the aim of this study was to develop an index for the degree of implementation that captures a broad range of issues that is considered to be important for effective programme delivery in the school setting.

Methods

Development of the index was based on data of 68 teachers at 18 schools implementing the school-based obesity prevention programme DOIIT. In line with recommendations of Domitrovich et al. (2008) and the implementation index of Dix et al. (2010), a teacher questionnaire including 44 implementation items was developed. Using Mplus, we conducted confirmatory factor analyses (CFA) to test the optimal combination of items. We calculated standardized coefficient scores to estimate a degree of implementation score for each teacher. Data were then aggregated at school level.

Results

CFA resulted for the degree of implementation in 33 items covering 8 dimensions: 1) fidelity to year 1 theory lesson delivery; 2) fidelity to year 2 theory lesson delivery; 3) fidelity to physical education lesson delivery; 4) fidelity to the implementation strategy; 5) dosage of the intervention; 6) dosage of the parental and support activities; 7) quality of intervention delivery and 8) quality of support delivery. The final implementation score ranges from 8 to 31 points (with higher scores corresponding with a higher degree of implementation).

Conclusions

This study contributes to the growing interest in measuring the degree of implementation. Although this new measurement approach should be regarded as a first attempt and not as an established implementation measure, the score on the 8 dimensions can be used by researchers as well as practitioners and policy makers to evaluate implementation. The stepwise development of the implementation measure serves as an example for the development of other implementation measures for future studies.

SO8.4.2

Assessing within- and between-day compensation of children's sitting and physical activity time using activPAL™

Nicola D. Ridgers, Anna Timperio, Ester Cerin, Jo Salmon
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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: The 'activitystat' hypothesis suggests that children compensate for increased physical activity at one time point by reducing their physical activity at another time point to maintain an overall activity set-point. However, compensatory changes across the physical activity spectrum (from sitting through to standing and stepping) have rarely been considered. This observational study examined whether compensatory changes in children's postural positions occur within- and between-days.

Methods: Children aged 8-11 years from 8 primary schools located in Melbourne, Australia, wore an activPAL™ (PAL Technologies Ltd, Glasgow) for 7 consecutive days (n=235). Sitting, standing and stepping time were derived for each day and for specific periods on weekdays and weekend days. Multilevel analyses were conducted using generalized linear latent and mixed models to estimate associations between temporally adjacent values (i.e. pairs of days; pairs of periods within-days) between the outcome variables.

Results: Significant associations were observed between temporally adjacent days and periods of the day. On any given day, an additional 10 minutes of stepping was associated with fewer minutes of stepping (~9 minutes; p<0.001) and standing (15 minutes; p<0.001) the following day. Greater time spent sitting during one period, regardless of being a weekday or weekend day, was associated with less time sitting and more time standing and stepping in the following period.

Conclusions: The results were consistent with the 'activitystat' hypothesis. Children appeared to compensate for increased sitting, standing, and stepping time both within- and between-days. The implications of short-term compensatory changes on the design and delivery of interventions that aim to increase children's physical activity levels require consideration.

SO8.4.3

Physical activity monitoring compliance strategies in children: A formative study

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose:

Satisfactory compliance to free-living physical activity (PA) monitoring protocols remains an issue for researchers. Various research-driven compliance strategies have been reported, however no study has obtained formative feedback on strategies participants perceive to be effective. This formative study explored the views of children and young people (CYP) on strategies to encourage free-living accelerometer wear time compliance with two types of accelerometers.

Methods:

The researcher adopted an interpretivist approach via focus groups to explore the views of children (8-11 years) and adolescents (12-15 years) in relation to using hip-mounted ActiGraph GT3XP-BT and wrist-worn GENEActiv accelerometers. Semi-structured, mixed gender focus groups were conducted in 7 primary schools (n=10; 47 children (25 female)) and 5 secondary schools (n=10; 49 adolescents (28 female)). Focus groups were transcribed verbatim and imported into the NUD*IST Nvivo v2 software package. Deductive and inductive analysis was represented via pen profiles (Mackintosh, et al 2011).

Results/ findings:

Deductive content analysis revealed seven general dimensions for useful or effective strategies to encourage compliance to habitual accelerometer wear: 1) participants to be offered rewards for compliance; 2) daily participant wear time reminders; 3) social conformity to improve accelerometer wear; 4) participants shown their 7 day wear time result; 5) enhanced accelerometer technology; 6) viewing participation as a privileged selection; 7) accelerometer to be provided with a storage box. During inductive analysis, differences in higher order and raw data themes emerged between CYP. Children preferred reminders such as; sticky note reminders (n=10) and electronic app reminders (n=7), whereas adolescents preferred rewards for compliance including; monetary compensation (n=8) and trips (n=6).

Conclusions:

Provision of reminders and rewards for accelerometry wear could be effective strategies to improve compliance to free-living PA monitoring protocols in CYP. In addition, social conformity may have an important role and warrants further investigation. Future research should investigate the effect of the identified strategies on compliance to habitual PA monitoring in CYP of similar racial, ethnic and cultural background to the present sample. Research into PA monitoring in CYP with varied backgrounds to the present sample are recommended to encompass a similar formative research phase.

SO8.4.4

Using objective measures to calibrate self-report tools: The Youth Activity Profile

Pedro Saint-Maurice, Gregory Welk
 Iowa State University, Ames, IA, USA

SIG: Yes, Cancer Prevention and Management

Awards: No

Purpose: Objective and subjective assessments of physical activity (PA) each have inherent advantages and disadvantages. This presentation describes a calibration method employed in the FLASHE Study that allows subjective reports of PA behavior from a brief survey to approximate estimated minutes of moderate-to-vigorous physical activity (MVPA) obtained from an objective accelerometer.

Methods: A total of 693 FLASHE participants (ages 12-17 years) were given a wrist-worn Actigraph physical activity monitor to wear for 7-days and asked to complete the Youth Activity Profile (YAP), a self-report tool specifically developed for calibration. The YAP includes 15 items (3 sections) that asks about physical activity patterns both in school (i.e., commuting to/from school, recess, physical education, lunch) and out-of-school (i.e., before school, after-school, evening, Saturday, and Sunday) as well as reports of time spent in sedentary activities. The raw scores obtained from the YAP are temporally linked to recorded minutes of MVPA and Sedentary time obtained from the Actigraph and modeled to reproduce time spent in activity obtained from these tools. Data processing was done using the R-code described in Presentation 2. By calibrating individual items in each section of the instrument it is possible to create composite estimates of the time spent in MVPA (in school and out of school) and also time spent in sedentary behaviors (SB).

Results: The presentation will describe the similarities between the distributions of YAP and accelerometer scores, and introduces the concept of calibration. We will specifically describe non-linear regression techniques used to scale YAP scores to accelerometer estimates of MVPA and SB. The separate calibration models used to estimate minutes of MVPA and SB in FLASHE will then be summarized. The computed estimates of total activity time will be shared along with reports of compliance in achieving national physical activity guidelines.

Conclusions: Physical activity questionnaires are still the most popular tool among researchers interested in physical activity. The described calibration method used in the FLASHE Study can advance the field by allowing that simple to use self-report tools be used to generate accelerometer-equivalent minutes of MVPA/ sedentary time in groups of youth.

SO8.4.5

Youth Physical Activity in First Nations Communities: An Exploration Using Two-Eyed Seeing

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective: Environmental factors like land-use mix play a critical role in the quality of physical activity (PA) opportunities available to youth (Ding et al., 2011). While the PA-environment link in urban centres is well understood, there has never been an exploration of the unique relationship First Nations youth have with their environment and how it might influence PA. The purpose of this study was to explore the PA-environment relationship with First Nations youth to inform the development of a PA environment assessment tool.

Methods: Guided by Two-Eyed Seeing, First Nations youth (n=14) were trained in art of Photovoice to capture how their community environment influences PA. In Photovoice, youth capture their experiences using photos. Next, youth were asked to be a part of a talking circle following local protocol, where they completed and discussed the Rural Active Living Assessment (RALA) tool in addition to sharing their photos. The RALA tool is a validated measure of the PA environment developed in United States. Data were analysed for themes using NVivo software.

Results: Youth indicated that their PA is influenced by the First Nations community environment through 1) Policy, 2) Community and Cultural Events, 3) Infrastructure, 4) Natural Environment, 5) Social Environment, 6) Transportation, 7) PA Programs, and 8) Relations. A separate theme, 9) Personal Attributes, encompasses individual characteristics that youth co-researchers noted during talking circles. A conceptual model demonstrating how youth PA is influenced by the environment was created and combined with RALA tool commentary to develop a PA environment assessment tool for First Nations communities.

Conclusions: Informed by both Indigenous and Western knowledge, this study represents the first exploration of the PA environment from a First Nations youth perspective. Findings indicate that PA is influenced by features such as wooded areas and bodies of water, which furthers our understanding of First Nations youth PA and provides the basis for a PA environment assessment tool. The resulting tool will be used to strengthen current PA efforts by documenting the PA environment and identifying areas where PA-related programming is needed once it has been validated.

SO8.4.6

Using an interactive ambulatory assessment with an activity-triggered e-diary to assess the association between physical activity and affective reactions in every day life

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Substantial evidence suggests that elderly's positive affective reactions are enhanced after participating in an exercise program. Despite the fact that older people are mostly active during everyday life, little is known about the variability of affective reactions due to everyday life activities. It is a challenge to assess psychological constructs like affective reactions as a function of physical activity because activity can be monitored continuously with a high frequency, but affective reactions can only be assessed in discrete intervals. To optimize the assessment of such an association, we developed an interactive ambulatory assessment with an activity-triggered e-diary. In the current study, we investigated within-subject effects of physical activity on three dimensions of momentary affective reactions (valence, energetic arousal, calmness).

Methods: Older adults (N = 74) between 50 and 70 years were assessed on three consecutive days. Physical activity in everyday life was assessed objectively with accelerometers. Affective reactions were measured as a function of the volume of the past 10 minutes of activity before the affect measurement. Whenever a predefined threshold for activity or inactivity was surpassed, the participants were prompted to fill out an e-diary on a smart phone to assess momentary affects. Data were analyzed with hierarchical multilevel analyses.

Results: When older people were more physically active, they felt more energized (energetic arousal) and agitated (calmness), but they did not feel happier (valence). Interestingly, body mass index demonstrated a significant cross-level interaction for valence. When the BMI score was lower, the participants rated the valence affect subscale higher after they were physically active.

Conclusions: Activity triggered ambulatory assessment is a promising interactive assessment, especially when analyzing the association between variables, which rarely occur (e.g. physical activity of older adults) or cannot be measured continuously, like many psychological variables. Due to the findings of this study, everyday life activities improved affective reactions of older people. However, older people feel energized after physical activity, but not necessarily happier. BMI moderates this association. These findings have implications for interventions that aim to enhance elderly's mental health.

Funding: DFG (Deutsche Forschungsgemeinschaft) KA 3279/1-1

SO8.4.7

R-package GGIR: an open analytical tool for processing multi-day raw accelerometer data

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SIG: Yes, Cancer Prevention and Management

Awards: No

Purpose: Raw accelerometry is increasingly being used in physical activity research, e.g. NHANES. Various reports have been made on data processing methods for raw accelerometer data. The focus of these reports has primarily been on gaining insights or establishing validity and less on making the method accessible and feasible to a broad audience. Therefore, the aim of this project was to develop an open access public tool for the analysis of multi-day raw accelerometer data that can be operated based on a minimal learning curve, preferably without the involvement of the original developer.

Methods: The method has been developed in the programming environment R (<https://cran.r-project.org>). The code is designed to handle various study designs, data formats, sensor brands, and aims to incorporate various analytical techniques as they emerged over time. Key in the development was the access to large scale study data from Pelotas (Brazil) and London (UK) for testing. Further, the close interaction with end-users has been highly instrumental. The method is released as R-package GGIR (cran.r-project.org/web/packages/GGIR/index.html) and can be learnt without prior knowledge of R programming.

Results: The R-package comes with task specific functions and a shell function to wrap all functionalities together and provides a standard routine for processing data. The tool comes with the following core functionalities: Auto-calibration, non-wear detection, feature selection, missing data imputation, and basic descriptive summary measures generation. The tool has now been tested and implemented in a wide range of studies. The running speed per measurement varies between 20 and 60 minutes depending on analysis settings, data format, measurement duration and the computational environment.

Conclusions: The package as it facilitates the analysis of raw accelerometer data with at least the same level of sophistication as traditional accelerometer data. However, the flexibility of data analysis and freedom for ongoing innovation should be particularly instrumental in encouraging a scientific debate about how these data need to be processed. An important challenge for the future is managing the ongoing expansions and growing complexity. Guidance for operating and understanding the tool(s) will therefore become of utmost importance.

SO8.4.8

Objective and self-reported occupational sitting and standing time: validity and responsiveness

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Valid instruments that detect changes in occupational sitting and standing time (e.g. responsiveness to change) are essential when evaluating effects of activity-permissive workplace interventions. Therefore, this study aimed: 1) to determine the criterion validity of the ActiGraph accelerometer, Occupational Sitting and Physical Activity Questionnaire (OSPAQ) and Workforce Sitting Questionnaire (WSQ) to assess occupational sitting and standing time compared to the activPAL, and 2) to determine the responsiveness of the activPAL, ActiGraph, OSPAQ and WSQ to changes in occupational sitting and standing time following the successful introduction of a sit-stand workstation.

Methods: 42 participants took part in the Stand@Work intervention trial that used a randomized controlled crossover design with a waitlist control group and rolling recruitment. Six (T0) and two weeks before (T1) they were introduced to a sit-stand workstation and three weeks thereafter (T2), participants completed the OSPAQ and WSQ and wore an ActiGraph and activPAL activity monitor. The activPAL was used as the criterion validity measure.

Results: The ActiGraph showed strong validity for occupational sedentary time at T0 and T1 (Spearman rho=0.79 and 0.69), but its validity dropped substantially after introduction of the sit-stand workstation (rho=0.10). Correlations of ActiGraph occupational 'light intensity' activity and activPAL occupational standing time varied between 0.31-0.66. The occupational sitting validity correlation of the OSPAQ and WSQ varied from 0.35-0.41 and 0.25-0.30, respectively, and between 0.06-0.68 for the OSPAQ for occupational standing time. The intervention-induced changes in occupational sitting and standing time were well detected by the activPAL, OSPAQ and WSQ (sitting only), but not by the ActiGraph, which had the lowest responsiveness to change.

Conclusion: Since the workplace is regarded as a suitable setting to interrupt prolonged sitting periods, future studies aimed at determining differences in occupational sitting and standing time should contemplate the activPAL-type inclinometers as a preferred objective measure. Simple questionnaires showed sufficient validity and can be used in addition to an objective measure or by itself when objective monitoring is not possible. The hip-worn ActiGraph was unable to distinguish between occupational sitting and standing time, when using uniaxial data and traditional cut-points for sedentary time and light intensity activity.

SO9.4. SHORT-ORAL:

Physical activity, sedentary behavior and health

SO9.4.1

Health gain of physical activity and sedentary behavior interventions: Health modelling approach

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Increasing physical activity (PA) and decreasing sedentary behavior (SB) could reduce the incidence and case fatality of several chronic diseases. We estimated the life expectancy and quality-adjusted life-years (QALY) gain of hypothetical interventions designed to change PA and/or SB among adults (50+) in England.

Methods:

The background PA and SB data for the study population was obtained from the Health Survey for England 2012. The background PA levels by age and gender were based on self-reported work, household work, recreational activity and walking, and SB levels for time spent sitting at work, home and watching TV. The interventions were defined as three scenarios: a) an increase in moderate to vigorous physical activity (MVPA) of 30 minutes per adult among adults who currently do less than 150 minutes per week; b) reduction in sedentary time of 60 minutes per adults; c) scenarios (a) and (b) combined. All scenarios were applied to the adult (50+ year old) population. The health benefits of scenarios were estimated with a proportional multi state life table model that predicted changes in the incidence and case fatality of different diseases. Diseases included were: ischemic heart disease, stroke, dementia, type-2 diabetes, colon cancer, breast cancer, prostate cancer, lung cancer and pancreatic cancer. Health benefits between scenarios were illustrated with the changes in life expectancy and QALYs measures.

Results/findings:

PA scenario increased life expectancy by 0.5 years for males and 0.6 years for females. For SB scenario life expectancy increase would be approximately 0.08 years for both genders. Combined benefits of PA and SB scenarios were similar to the effectiveness of PA scenario alone. QALY gain of the PA scenario was approximately 400 and 500 QALYs per 1000 people for males and females, respectively.

Conclusions:

Small increase of PA would increase life expectancy and QALYs in the population more than moderate decrease of SB. Estimating of the health benefits involved number of uncertainties and assumptions, and in the following phase of the project we will further analyze and illustrate the impact of these uncertainties.

SO9.4.2

Investigating the relationship between active commuting and biological antecedents of cardiovascular disease in mid-life: Evidence from UK Biobank

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objectives: The beneficial effects of physical activity on cardiovascular disease (CVD) outcomes are well understood. Among Western populations however, lifestyles have become increasingly sedentary. Active commuting (AC) has been promoted as a way of incorporating greater levels of activity into daily life. The study objectives are: (i) To describe the prevalence and patterning of AC among adults in mid-life in the UK; (ii) To test associations between AC and biological antecedents of CVD; (iii) To investigate the roles of socioeconomic and behavioural factors.

Methods: This is the first AC study to utilise baseline (2006-2010) data from UK Biobank: a nationally representative sample (n=500,000) aged 40-69. The analytic sample was restricted to 265,704 individuals who commuted. The exposure of interest was operationalised as 3 categories: (i) Active transport; (ii) Public transport; (iii) Private transport. The outcomes were objectively measured: BMI, hypertension, percentage body fat, and cardio-respiratory fitness. Multivariate linear and logistic regression modelling was undertaken. Commute frequency and distance data were utilised to investigate possible dose-response relationships.

Results: Preliminary results suggest strong, independent associations between AC and objectively assessed biological outcomes on the CVD pathway in this large sample of UK adults. In age-adjusted linear regression analysis, men who cycled to work had BMI scores 2.5 points lower on average than their counterparts who used motorised transport (95% CI 2.7 to 2.3). Men who walked to work had BMI scores 0.6 points lower than those who travelled by motorised transport (95% CI 0.67 to 0.50). Results of similar magnitude and significance were observed for women. Findings from multivariate linear regression analysis will be presented, with results adjusted for a range of hypothesised confounding covariates including: diet quality, socioeconomic status, income, limiting illness, leisure and occupational physical activity. Results will also be presented for the other outcomes of interest: percentage body fat, hypertension and cardiorespiratory fitness.

Conclusions: UK Biobank provides a unique opportunity to investigate the relationships between active commuting and cardiovascular health in a large, nationally representative dataset using objectively measured outcomes. Preliminary findings corroborate previous research in suggesting strong, independent associations between AC and objectively assessed CVD-related outcomes.

SO9.4.3

Associations of sedentary time patterns and TV viewing time with inflammatory and endothelial function biomarkers in children

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: The relationship between cardiovascular disease-related biomarkers and sedentary time in children is currently unknown. Thus, our objective was to investigate the associations of TV viewing time and accelerometry-derived sedentary time with inflammatory and endothelial function biomarkers in primary school aged children.

Methods: A cross-sectional analysis based on the Transform-Us! study in 164 (87 girls), 7-to 10-year old children, attending primary schools in Melbourne, Australia. Weekly TV-viewing time was assessed by parental proxy-report and total sedentary time and patterns of sedentary time accumulation (e.g. prolonged bouts) were assessed by accelerometry. The cardiometabolic biomarkers assessed were: C-reactive protein (CRP), homeostasis model assessment of insulin resistance (HOMA-IR), interleukin-2 (IL-2), -6 (IL-6), -8 (IL-8), -10 (IL-10), tumor necrosis factor alpha (TNF- α), adiponectin, resistin, brain derived neurotrophic factor (BDNF), soluble intercellular and vascular adhesion molecule 1 (sICAM-1, sVCAM-1), plasminogen activator inhibitor 1 (PAI-1) and soluble E-selectin. Generalized linear models with standard errors accounting for clustering at the class level were used to assess the associations of sedentary time with biomarkers, adjusting for sex, waist circumference, moderate-to vigorous-intensity physical activity (MVPA) and diet density.

Results: Each additional hr/wk of TV viewing was associated with 4.4% (95% CI: 2.1, 6.7) greater CRP and 0.6% (0.2, 1.0) greater sVCAM-1, independent of confounders. The association of the frequency and duration of 5-10 minute bouts of sedentary time with CRP was positive and approached statistical significance ($p=0.056-0.084$).

Conclusions: This study indicates there is a detrimental association between prolonged bouts of sedentary time with markers of inflammation in healthy children, which adds to the wealth of research supporting a reduction in TV viewing during childhood to benefit health. Given recent recommendations that state children should break up prolonged periods of sedentary time, public health policies would benefit from further work directed at understanding how the accumulation of sedentary time influences health outcomes early in life.

SO9.4.4

Is the relationship between sedentary behaviour and cardiometabolic health in adolescents independent of dietary intake? A systematic review

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: The aim of this systematic review was to explore whether the associations between sedentary behaviour and cardiometabolic risk markers are independent of dietary intake in adolescents aged 12-18 years.

Methods: Online databases (Medline, Global Health, PsycInfo, Web of Science and Embase) and personal libraries were searched for peer-reviewed original research articles published in English before March 2014. Eligibility criteria were: 1) participants aged 12-18 years; 2) included a measure of sedentary behaviour as an independent variable; 3) controlled for dietary intake (defined as intakes of energy, macronutrients, food or beverages) in the analyses; and 4) assessed at least one cardiometabolic risk marker as the main outcome (i.e. adiposity, blood pressure, insulin sensitivity, glucose tolerance or lipid levels) or cardiometabolic conditions. Two reviewers independently screened the full-text for eligibility and rated the methodological quality of the studies.

Results: Twenty-five studies met the inclusion criteria, with all studies considered to be of high quality (quality scores ranged from 60-84%). From the 21 studies examining sedentary behaviours and adiposity, the majority found significant associations between television viewing, total screen time and total self-reported sedentary time with markers of adiposity, independent of dietary intake. However, no consistent pattern in dietary variables was identified. Three studies examined associations between sedentary behaviour and cardiometabolic markers other than adiposity, with no significant associations observed between total screen time and blood pressure. Due to a lack of studies, there was insufficient evidence of associations between sedentary time and the remaining cardiometabolic markers or metabolic syndrome.

Conclusions: This systematic review found consistent evidence that television viewing, total screen time and self-reported sedentary time are independently associated with adiposity in adolescents, irrespective of dietary intake. However, due to the variability of dietary variables that were adjusted for in the analyses, no clear pattern was identified. Additionally, no studies used objective measures to assess sedentary time and there was limited evidence to draw conclusions regarding other cardiometabolic risk markers. Thus, future work is needed to understand the role of dietary intake in the associations between screen time behaviours, objectively-measured sedentary time and cardiometabolic risk markers in adolescents.

SO9.4.5

Objectively assessed physical activity and sedentary behaviour of adults with mental illness

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Given the high morbidity and mortality of adults with mental illness, it is important to understand the levels of physical activity (PA) and sedentary behaviour (SB) in this group. The study aim was to objectively assess PA and SB in non-institutionalised adults with mental illness.

Methods:

This was a cross-sectional study. Participants were recruited from outpatient clinics and community organisations in Brisbane, Australia. Participants wore an ActiGraph GT3X+ accelerometer 24 hrs/day for seven days. Data were considered valid if the accelerometer was worn for at least 90% of their day time on at least four days of the week, including at least one weekend day. Accelerometry estimates of time spent in SB, light activity, moderate-to-vigorous physical activity (MVPA), bout durations, and breaks in sedentary time, were calculated.

Results/findings:

Of those who consented, 12% subsequently withdrew; 101 participants completed the study, 76% of whom met the minimum wear-time criteria. The median duration of the valid days of monitoring was 14.6 hours (range=9.8 to 19.0), which was 98% (range=93% to 100%) of wear-time. MVPA accounted for 3% (26 minutes/day) of wear-time; 7% of this time was in bouts of 10 minutes or more. Light activity accounted for 30% (4.2 hours/day) of wear-time, and SB accounted for 65% of wear-time (9.2 hours/day), 34% of which was in bouts over 20 minutes in duration. The median number of breaks in sedentary time was 87 breaks/day, the median break length was 3.3 minutes, and the median average break intensity was 533 cpm, which is light intensity.

Conclusions:

Adults with mental illness spend about two-thirds of their waking time sitting or lying down (about a third of which is accumulated in prolonged bouts), and break up sedentary time with short bouts of light intensity activity. While accumulating MVPA throughout the day, only a small portion is accumulated in bouts of at least 10 minutes. The results demonstrate a need for further research into interventions to decrease SB in this group.

SO9.4.6

Interrupting sedentary time improves short-term metabolic function in healthy 7-11 year old children

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Children who spend more time engaged in sedentary behaviors have greater risk of developing obesity, independent of physical activity. This clinical study's objective is to investigate whether interrupting sedentary behavior improves metabolic parameters and aspects of cognitive function (working memory and attention), affect, anxiety, and dietary intake. The primary hypothesis is that interrupting sitting with bouts of moderate physical activity would decrease insulin incremental area under the curve (iAUC) compared to insulin iAUC obtained during prolonged sitting.

Methods: In this cross-over study, normal weight (N=20; 50% male) 7-11 year old children underwent two experimental conditions in random order on different days: prolonged sitting (3 hours of continuous sitting) and interrupted sitting (3 minutes of moderate-intensity (80% of anaerobic threshold) walking every 30 minutes). Insulin, C-peptide, and glucose were measured every 30 minutes for 3 hours following an oral glucose tolerance test. Cognitive function, attention, affect, and anxiety were measured at post-test. Children were then presented with a 9800 kcal buffet meal, to determine total energy intake and percent intakes from protein, carbohydrate, and fat. Insulin and glucose iAUC were assessed for each experimental condition. Paired t-tests assessed differences in iAUC and post-test scores and kcal intake by experimental condition.

Results: Consistent with the hypotheses, interrupting sitting resulted in a 37% lower insulin iAUC ($p<0.001$), 21% lower C-peptide iAUC ($p<0.001$), and 7% lower glucose iAUC ($p=0.04$). Subsequent total energy intake did not significantly differ between the prolonged sitting and interrupted sitting conditions (941 ± 380 vs. 910 ± 284 kcal, $p=0.65$), nor did percent intakes of protein, carbohydrate, or fat. There were no significant differences in post-test scores for working memory, attention, affect, or anxiety.

Conclusions: Interrupting sedentary time with short (3 minutes) moderate-intensity walking breaks improves short-term metabolic function, likely through increased glucose effectiveness, without increasing subsequent energy intake in healthy children or adversely altering short-term cognitive function, affect, or anxiety symptoms. These findings suggest interrupting sitting may be a promising intervention strategy for reducing cardiometabolic risk in children. Future studies that investigate the longer-term metabolic effects of interrupting sitting are warranted.

SO9.4.7

School-Based Health Promotion: Improving Physical Activity and Reducing Health Inequalities

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: Comprehensive school health (CSH) is a multifaceted approach to health promotion. The objectives of the present study were to assess whether CSH programs foster positive health behaviours outside school and if they reduce or exacerbate health inequalities.

Methods: This was a quasi-experimental, pre-post trial with a parallel, nonequivalent control group. Intervention schools had to be located in socioeconomically disadvantaged neighborhoods. In 2009 and 2011, pedometer recordings (7 full days) and demographic data were collected from cross-sectional samples of grade 5 students from 10 intervention and 20 comparison schools. Student's height and bodyweight were measured to calculate body mass index and assess weight status. Socioeconomic status was determined from parent self-report. 1157 students participated in the study. Analyses were adjusted for potential confounders and the clustered design.

Results: In 2009, students from intervention schools were less active than those from comparison schools (10,827 vs. 12,265 steps/day $p < 0.001$). Physical activity increased among both intervention and comparison schools from 2009 to 2011, though the increase in steps was greater in intervention schools than in comparison schools (school-days: 1221 steps/day; $P = 0.009$; weekends: 2001 steps/day; $P = 0.005$). From 2009 to 2011, the relative difference in steps between intervention and comparison schools reduced from -11.1% to -1.6% among normal weight students, from -16.8% to -1.4% among overweight students, and was balanced across socioeconomic subgroups.

Conclusions: These findings provide evidence of the effectiveness of CSH to affect children's physical activity during and outside school. They also demonstrate that CSH programs implemented in disadvantaged neighbourhoods reduce physical activity inequalities. Results of this study justify broader implementation of effective CSH interventions for physical activity promotion and obesity prevention in the long term, and may also reduce health inequities.

SO9.4.8

Energy balance-related behaviors at age 2 are associated with adiposity at age 5: results from the EDEN mother-child cohort

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SIG: Yes, Children and families

Awards: No

Purpose: Few longitudinal studies have assessed the influence of physical activity (PA), sedentary (SB) and dietary behaviors during toddlerhood on later adiposity development, accounting for the three behaviors simultaneously. We aimed to analyze the independent associations between PA, SB and diet at age 2 and child adiposity at age 5 using comprehensive measures of adiposity.

Methods: This study included 410 girls and 473 boys from the French EDEN mother-child cohort. Postal questionnaires were sent to parents when their child was aged 2 y, including questions regarding time spent playing outside and in front of a screen, respectively used as proxies for PA and SB. A food frequency questionnaire allowed the derivation of two dietary patterns, labeled "Guidelines" and "Processed, fast-foods". Adiposity was assessed at age 5 by body mass index (BMI) and percentage of fat mass (FM), calculated from anthropometric measures and bioelectrical impedance analysis. First, we analyzed the independent association between PA, SB and diet at age 2 and adiposity at age 5 separately and then simultaneously by multivariable linear regression adjusted for the center, BMI at 2 y and exact age at the "5 y" clinical examination. Finally, we adjusted for socio-economic position (SEP) assessed by maternal education and household income. All analyses were stratified by gender.

Findings: Among girls, lower PA, higher SB and higher "Processed, fast-foods" pattern scores at age 2 were positively and independently associated with FM at age 5, though the association with diet did not remain significant after a further adjustment for SEP. Among boys, SB at age 2 was positively associated with FM at age 5, and PA at age 2 was positively associated with BMI at age 5 in fully adjusted models. There was no association between diet at age 2 and adiposity at age 5.

Conclusions: This study suggests longitudinal and gender differentiated relationships between energy balance-related behaviors and later development of body FM, which appear as early as toddlerhood. These findings underscore the importance of early multi-behavioral obesity prevention interventions.

PO.1

Dietary Patterns and Adherence to the Mediterranean Diet among Breast Cancer Female Patients in Beirut, Lebanon: A Cross-Sectional Study

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SIG: Yes, Cancer Prevention and Management

Awards:

Breast cancer is the most commonly diagnosed cancer site among women worldwide and the second most common cause of cancer mortality. Breast cancer rates differ vastly between geographical areas, countries, and within the same country. In Lebanon, the proportion of breast cancer to all other sites of tumor is 38.2%; these rates are still lower than those observed worldwide, but remain the highest among Arab countries. Studies and evidence based reviews show a strong association between breast cancer development and prognosis and dietary habits, specifically the Mediterranean diet (MD). As such, the aim of this study is to examine dietary patterns and adherence to the MD among a sample of 182 BC female patients in Beirut, Lebanon. Subjects were recruited from two major hospitals; a private medical center and a public hospital. All subjects were administered two questionnaires: socio-demographics and Mediterranean diet adherence. Five Mediterranean scores were calculated: MS, MSDPS, PMDI, PREDIMED and DDS. The mean age of the participants was 53.78 years. The overall adherence to the Mediterranean diet (MD) was low since the sample means of 3 out of the 5 calculated scores were less than the scores' medians. Given that 4 out of the 5 Mediterranean scores significantly varied between the recruitment sites, women in the private medical center were found to adhere more to the MD. Our results also show that the majority of the sample population's intakes are exceeding the recommendations for total and saturated fat, while meeting the requirements for fiber, EPA, DHA and Linolenic Acid. Participants in the private medical center were consuming significantly more calories, carbohydrates, fiber, sugar, Lycopene, Calcium, Iron and Folate and less fat. After conducting multivariate linear regression analyses, the following significant results were observed: positive associations between MD (CPMDI, PREDIMED) and monthly income & current state of health, while negative associations between MD (MSDPS, PREDIMED) and age & employment status. Our findings indicated a low overall adherence to the MD and identified factors associated with it; which suggests a need to address dietary habits among BC patients in Lebanon, specifically encouraging them to adhere to their traditional MD.

PO.2

The Unexplored Relationship between Diet & Mental Health: A review

PREETI KHANNA

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SIG: Yes, Children and families

Awards:

Background & Purpose: In order to understand eating behaviour of adolescents, insight into determinants of intake is necessary. Research has shown that anxiety and depression are associated with an increased risk for diabetes type 2, partly through their association with obesity and the metabolic syndrome, whereas both behavioral and biological mechanisms mediate such relations. Findings from existing research suggest that a more comprehensive approach to children & adolescents with obesity may provide novel methods of obesity management. The objective of this paper is to understand the relationship between diet & mental health.

Methods: Relevant Papers were identified from PubMed, Science Direct, Google Scholar, NCBI & Medline by using all combinations of the search terms: "mental health, dietary intake, eating disorders, obesity, underweight or adolescents & children". Research studies examining the relationship between mental health & food intake among children & adolescents were included in the review process. Based on inclusion – exclusion criteria full text papers were reviewed.

Results: A number of behavioral and emotional parameters connect obesity to anxiety and depression in children. Similarly to adults, children suffering from anxiety and/or depression are typically characterized by poor adherence to self-care activities, by sedentary habits and lack of physical exercise, excessive television and internet viewing and disturbed eating behaviors, such as emotional eating and consumption of comfort foods. The association between diet and depression has previously mainly been studied in cross sectional studies, and only few prospective studies have been published. The evidence suggests that folate and long-chain n-3 polyunsaturated fatty acids (PUFAs) may be connected to the decreased risk of depression. Furthermore, only few studies have concentrated on the association between general dietary patterns and depression.

Conclusion: Dietary intake may also have a direct impact on various biological systems and mechanisms that underpin depression, including oxidative processes, the functioning of the immune system, and levels of salient brain proteins. While considering the role of diet & depression, several points need to be considered. Hence, this relationship needs more exploration.

PO.3

Youth Building Roots Photovoice Project: A Youth Perspective on Where Food Comes From

Samantha Davis^{1,2}, Rickie Brawer¹, Christiaan Morssink²
¹Thomas Jefferson University, Philadelphia, PA, USA, ²The United Nations Association of Greater Philadelphia, Philadelphia, PA, USA

SIG: Yes, Socioeconomic inequalities

Awards:

The primary objectives of the project were: To gain insight on youth perspectives of where young people believe their food comes from and how they understand food systems, on the individual, interpersonal and environmental levels. Explore how culture and access influence food choices and consumption, of adolescent aged students in Philadelphia, Pennsylvania, USA. And to create a dialogue and stimulate social change for sustainable food systems while increasing awareness for food related issues both locally and globally. The project was carried out with middle school students (age range 11-15 years old) in Philadelphia and was a supplement to The United Nations Association of Philadelphia's program titled Youth Building Roots. Photovoice, a form of community based participatory research, is the methodology used to explore project aims. Over two months, students participated in four events, each was tape-recorded and transcribed. Coding, content analysis, theme organization and frequency counting subsequently occurred. To ensure accuracy triangulation was used. Three major themes emerged: culture and food, eating healthy, and food supply and systems, with sub-themes under each. Most frequent of the major themes was eating healthy and the most common sub-theme was school food. Students spoke positively towards healthy eating, demanded a change in school food policy and showed interest in sustainable urban agriculture. Openness about cultural differences in food preferences and a lack of detailed understanding about local and global food networks were observed. Future direction includes empowering youth and other stakeholders to create change in community food systems.

PO.4

PREVALENCE OF PICA BEHAVIOUR AMONG PREGNANT WOMEN IN THE BIBIANI-ANHWIASO BEKWAI DISTRICT IN THE WESTERN REGION OF GHANA. Isaac Boadu¹ (Presenting), Mrs. Faustina O. Mensah² and Jeffery Dadson^{3,1*,2,3} Department of Biochemistry and Biotechnology - Kwame Nkrumah University of Science and Technology (KNUST) - Kumasi. Isaac Boadu1*-domainjnr14@gmail.com

Isaac Boadu, Faustina O. Mensah, Jeffery Kweku Dadson
 Kwame Nkrumah University Of Science and Technology, Kumasi, Ghana

SIG: Yes, Policies and environments

Awards:

Purpose: The purpose of this study was to find the prevalence of pica behaviour among pregnant women residing in rural and urban environs of Bibiani-Anhwiaso Bekwai District in the Western Region of Ghana and to evaluate the possible medical risk associated with the pica practices.

Methods: A total of 400 pregnant women who were receiving antenatal care at two health centres, Divine Love hospital and Bibiani government hospital were interviewed using a comprehensive questionnaire. Information on maternal haemoglobin levels, blood pressures as well as available birth weights of babies of the pregnant women were recorded based on their medical records.

Results: The prevalence of pica in the total population studied during pregnancy was 30.25% (n= 121) with a prevalence of 63.64% (n=77) in the rural group and 36.36% (n = 44) in the urban group. The ingestion of white clay (61.16%), red clay (16.53%) and ice (8.26%) were high among the 400 pregnant women. White clay (58.44%, n=45) was the common pica item among the rural group and ice (20.45%, n=9) recorded the highest in the urban group. Haemoglobin levels of pregnant women practising pica were lower than the non-pica pregnant women in all the three trimesters of pregnancy (p<0.05). There was no significant difference in the mean birth weight of the babies of pica and non-pica pregnant women (p>0.05).

Conclusions: The findings suggest that pica is prevalent among pregnant women in the District and hence the need for education to create awareness. There is also the need to educate pregnant women about healthy nutritional practices particularly in developing countries like Ghana.

PO.5

Salt intake behaviors: assessment of psychosocial determinants according to sociodemographic and clinical factors in hypertensive individuals.

Milena Sia Perin, Maria Cecilia Gallani, Marília Estevam Cornélio
UNICAMP, Campinas, São Paulo, Brazil

SIG: Yes, Socioeconomic inequalities

Awards:

Purpose:

This study was aimed at evaluating the association among sociodemographic and clinical characteristics of hypertensive outpatients and the psychosocial determinants of behaviors related to salt intake.

Methods:

Two behaviors related to salt intake were evaluated; 1- 'adding less than 4g of salt/day during cooking' and 2- 'avoiding the consumption of high salt content foods/industrialized foods', among 108 hypertensive outpatients. A validated questionnaire based on an extended version of the Theory of Planned Behavior was used to measure behavior, intention, attitude, subjective norm, perceived behavioral control, habit and self-efficacy. Associations were investigated by correlation (Spearman coefficient), comparison (Mann-Whitney) and (Chi-square) analyses.

Findings:

Regarding behavior 1, higher body mass indexes (BMI) were associated with lower intention and lower self-efficacy to reduce salt addition, but with higher habit scores of not restricting salt addition. Positive correlations were observed between perceived behavioral control and length of hypertension diagnosis. Additionally, non-white women had lower scores of self-efficacy than white women. For behavior 2, the lower the monthly income, the lower the intention, the perceived behavioral control and the self-efficacy related to the intake of salty foods. Indeed, men presented lower intention to avoid the consumption of salty foods than women.

Conclusion:

Our data point that the psychosocial determinants related to the different behaviors of salt intake vary according to sociodemographic and clinical characteristics of hypertensive outpatients. Then, further educational interventions must consider carefully those patients with higher BMI, recently diagnosed as hypertensive, male and non-white women, as well as those with lower incomes with possibly higher risk of experiencing difficulties in changing their behaviors related to salt intake.

PO.6

Optimization of Complementary feeding Practices in resource limited setting: A behaviour change Intervention.

fahmina anwar, Ratan srivastava
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SIG: Yes, Children and families

Awards:

The period of complementary feeding (6–23 months) is a time when young children are most vulnerable to under nutrition and consequent growth faltering. It is time when complementary foods are initiated, often coinciding with decreased breast milk consumption and increased micronutrient deficiencies and diarrheal illness. Inappropriate care and feeding practices are recognized as some of the underlying causes of under nutrition.

Objective: Behaviour change interventions aiming to improve complementary feeding practices.

Methodology: The study was conducted in rural India (June 2012 to march 2013), 107 mother and child pair was selected from two village of Varanasi district by random sampling methodology and further study villages were enumerated to identify mother and child pair (6–23 months) to develop a sampling frame. Appropriate sampling methodology was adopted to enrol the study subjects. Study was approved by the ethical committee of the institution and informed consent was taken from mothers. Four short-term behavioural change intervention trials were recommended.

Results: Following recommendations to increase the amount of food provided to infants, the mean intakes from single meals increased from 35 ± 18 g during pre intervention to 55 ± 25 g in post intervention phase ($p < 0.05$). The mean meal frequency increased from 2.0 ± 1.3 during pre intervention to 3.1 ± 1 post intervention phase ($p < 0.05$). Provision of high-energy-density diets, prepared by adding oil in feed, increased single-meal energy consumption from 48 ± 25 kcal to 65 ± 32 kcal ($p < 0.05$).

Conclusion: It is possible to change short-term child-feeding behaviours to promote increased food intake, meal frequency, energy density however the long-term sustainability of these change requires further study.

PO.7

Food-choice motives among public junior-high school students in Jakarta, Indonesia

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SIG: Yes, Socioeconomic inequalities

Awards:

Background: Dietary behavior during adolescence can establish habits that endure through adulthood. Adolescents in Indonesia today have some freedom in making food choices, which may be unhealthy. Interventions to help them make healthy choices should be based on evidence of their motives in choosing foods. Steptoe's modified Food Choice Questionnaire (FCQ) can be used to measure those motives, but it has never been adapted and used properly in Indonesia. We therefore carried out psychometric testing of the FCQ among adolescents in Indonesia. We then studied associations between their socio-demographic characteristics and their food-choice motives.

Methods: This cross-sectional study was conducted among 681 students (13 to 14 years old) at public junior high schools in Jakarta, Indonesia. Food-choice motives were measured with the FCQ. The independent variables included gender, parents' educational level, parents' occupation, family affluence, family dinner frequency, and body-mass index. After principal factor analysis of the FCQ data, subscale reliabilities (coefficient alpha) were computed. Mixed-effects linear regression was used to quantify the associations of the independent variables with food-choice motives.

Results: Three food-choice motives (subscales) were obtained from factor analysis and reliability testing: *comfort*, *convenience and price*, and *health*. The subscale with the greatest mean value was *health*. Family affluence was inversely associated with the *convenience and price* subscale ($b = -0.05$, $P = 0.01$), and also with the *health* subscale ($b = -0.04$; $P = 0.02$). Female students were less likely than male students to consider health when choosing a food ($b = -0.16$; $P = 0.03$).

Discussion and Conclusions: The Food Choice Questionnaire can provide reliable measures of food choice motives among these adolescents while its factor structure differed from those found in previous studies of adults. Students from less affluent families placed more importance on food's convenience and price, but those who were more affluent did not necessarily make healthier choices. Male students were more likely than female students to choose healthy foods. Adolescents from different socioeconomic groups have different barriers to healthy food choices. Thus, interventions should be tailored, on the basis of the socioeconomic status of the target group. For example, subsidized meals might be provided to students from less affluent families.

PO.9

The validity of the Feeding Practice and Structure Questionnaire in an American sample

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SIG: Yes, Children and families

Awards:

Purpose:

The purpose of this study was to study the validity of the Feeding Practice and Structure Questionnaire (FPSQ) in an American sample. Jansen, Mallan, Nicholson and Daniels [1] recently published the construction and validation of the FPSQ in IJBNPA. This validation study was conducted with mothers of 21-27 month olds in Australia. The FPSQ is unique in that it merges important items and concepts across existing questionnaires that were already central to feeding literature [1].

Methods:

We replicated the published correlations [1] between the FPSQ and the Child Eating Behavior Questionnaire (CEBQ) [2] to determine if this measure performed well amongst a different sample-mothers and fathers of preschool aged children living in the United States. In addition to this replication, we correlated subscales from the FPSQ with the Tan and Holub Self-Regulation in Eating Scale [3] to establish further convergent validity. In order to make this measure appropriate for dissemination to a sample in the United States, we made minor wording adjustments to the original scale.

Results/findings:

We found results consistent with Jansen and colleagues [1] but some differences existed; for example, Reward for Behavior was insignificantly related to less Enjoyment of Food in their sample, and it was significantly related in our sample ($p < .05$). Additionally, the non-responsive feeding practices, Distrust in Appetite, Reward for Behavior, Reward for Eating and Persuasive Feeding were significantly negatively correlated with Self-Regulation in Eating, whereas the present study found that Structured Meal Setting and Family Meal Setting correlated with higher Self-Regulation in Eating.

Conclusions:

This study provides evidence for convergent validity of the FPSQ beyond the original validation sample. Non-responsive feeding practices and those related to structure of the meal environment appear to be correlated with less and more adaptive eating behaviors respectively.

References

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PO.10

Changes in children's meal orders following healthy menu modifications at a regional US restaurant chain: One year follow-up

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SIG: Yes, Policies and environments

Awards:

Objective: Children frequently consume food from restaurants that tends to be less nutrient-dense and more energy-dense than food prepared at home. Previously we showed healthier ordering patterns following the implementation of a healthier children's menu at a regional US restaurant chain. The new menu, implemented in April 2012, featured: 1) more children's meals meeting the National Restaurant Association's Kids LiveWell (KLW) nutrition standards; 2) healthy side dishes (strawberries, mixed vegetables, salad) bundled with meals by default; and 3) removal of French fries and soda, which could still be substituted for free. The current study uses newly-available data to assess children's meal orders >1 year after the implementation of the healthier menu.

Methods: Orders of children's menu items were abstracted from the Silver Diner's central database. Previous assessments took place PRE- (September 2011-March 2012) and POST- (September 2012-March 2013) healthier menu implementation. For the current study, orders were abstracted one year after the POST assessment (FOLLOW-UP, September 2013-March 2014) across the same 13 locations.

Results: Across the three study periods, 512,100 kids' meals were ordered. At PRE, 3% of meals ordered met KLW standards, while 46% did at POST and 45% at FOLLOW-UP. Across study periods, French fry orders decreased from 57% to 22% to 20% of bundled side dishes; strawberries increased from 29% to 63% to 66%; and mixed vegetables/salad shifted from 5% to 7% to 6%. Orders of soda decreased from 35% to 30% to 25% of children's beverages, and orders of milk and juice increased from 37% to 40% to 41%, and 28% to 31% to 33%, respectively. All paired proportions tests comparing PRE vs. POST and POST vs. FOLLOW-UP were significant ($p < .0001$).

Conclusions: Ordering patterns continued to improve in many cases. Increases in healthier side and beverage orders and decreases in less healthy side and beverage orders continued from POST to FOLLOW-UP, with the exception of bundled vegetable sides. In cases where healthy ordering patterns did not continue to improve (vegetable sides, KLW-eligible meals), orders at FOLLOW-UP still exceeded those at PRE. Similar interventions have the potential to promote healthier ordering patterns among children over time.

PO.11

Sodium content of Brazilian food products targeted at children with and without nutrient claims

Vanessa Mello Rodrigues^{1,2}, Giovanna Medeiros Rataichesk Fiates^{1,3}, Mike Rayner², Ana Carolina Fernandes¹, Renata Carvalho de Oliveira¹, Rossana Pacheco da Costa Proença¹
¹Federal University of Santa Catarina, Florianópolis, SC, Brazil, ²University of Oxford, Oxford, UK, ³University of Surrey, Guildford, UK

SIG: Yes, Policies and environments

Awards:

Purpose: Nutrient declaration is mandatory in Brazil, but additionally many manufacturers display nutrient claims on their product labels, including food products targeted at children. This study aimed to compare the sodium content of foods products targeted at children with and without nutrient claims, which has not been investigated before in the country.

Methods: A cross sectional study which audited all retailed food products in one store of the main supermarket chains in Brazil. Information on nutritional composition and nutrient claims (nutrient content claims and nutrient comparative claims) were collected from labels, using tablet computers. Food products targeted at children were defined according to classifications from food marketing studies, and were categorised into eight food groups according to the Brazilian Regulation. Sodium values per 100g of food were calculated based on serving size information. Comparison of sodium content between food products targeted at children with and without nutrient claims employed the Mann-Whitney U test ($p < 0.001$).

Results: From the 5620 food products identified, 535 (9.5%) were targeted at children, of which 270 (50.5%) displayed nutrient claims. The most common nutrient claims were related to the presence or increased amount of vitamins and minerals. The overall content of sodium/100g was three times higher in food products targeted at children with nutrition claims than in those without claims (226.7mg; 74.5mg, respectively). This was equivalent across some categories of foods, i.e. group 1 - baking goods, breads, cereals, legumes, roots and tubers (416.7mg; 22.5mg); group 7 - sugars, sweets, confectioneries, biscuits, snacks and soft drinks (225.0mg; 52.7mg); and group 8 - gravies, sauces, ready-made seasoning, broths and ready meals (1720.0mg; 392.6mg). A higher amount of sodium was observed only in food products without nutrient claims of group 4 - milk and dairy products, which showed a median of 14.5mg/100g less sodium.

Conclusions: Higher amounts of sodium were found in most of food products with nutrient claims targeted at children. This should be considered in discussions regarding public policies about the marketing of foods targeted at this group. It is also necessary to address other nutrients, as well as investigate parents' perceptions about these claims.

PO.12

University students' perceptions of the relationship between bus pass ownership and physical activity levels

Hieu Ly, Jennifer Irwin
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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

The purpose of this study was to assess university students' perceptions of how having a discounted bus pass influences their physical activity levels.

Methods:

A sample of 545 Canadian undergraduate students completed an online survey during the Fall semester of 2014. The survey consisted of sixty closed-ended questions (along a five-point Likert scale) and one open-ended question that assessed: (a) students' perceptions of the discounted bus pass; (b) transit-related physical activity; and (c) weekly physical activity levels. Ten undergraduate students and five graduate students from Western University pilot tested the survey to assess face validity. The analyses of this study included full-time undergraduate students who received the discounted bus pass as part of their tuition package from Western University. Data was analyzed using descriptive statistics, three bivariate correlations, and three independent samples *t*-tests. Inductive content analysis was conducted on the open-ended responses to identify major themes from supporting quotations.

Results/findings:

Approximately 84% ($n = 452$) of participants were ≤ 24 years and seven part-time undergraduate students were excluded from data analyses as per the inclusion criteria. Students' perceptions of the discounted bus pass and their transit-related physical activity had a moderate positive relationship at $r = .44, p < .001$ with a $R^2 = .19$. Male and female students' weekly physical activity levels were significantly different at $t = 2.06, p < .05$. The following major themes were identified from the open-ended responses: the discounted bus pass is a facilitator of physical activity; the discounted bus pass is a barrier to physical activity; and, the discounted bus pass does not influence university students' physical activity levels.

Conclusions:

The results of this study suggest that university students who are provided with discounted transit passes may have increased physical activity levels during their daily commutes using public transit. The findings provide insight for innovative campus-based programs looking to enhance university students' physical activity levels. Furthermore, the findings can potentially be utilized in future work to identify ways to increase or decrease bus pass ownership in service of enhancing physical activity levels among university students.

PO.13

"Being physically active helps me regulate my eating!" But is it always so?

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SIG: Yes, Motivational Dynamics

Awards:

Objective: Prior research suggests that exercise facilitates the regulation of eating behavior by promoting more autonomous (internal) motivations and greater attentiveness to body signals (intuitive eating). Yet, the reasons underlying people's decision to be active might affect these associations. This hypothesis was examined by comparing three groups of individuals, those reporting weight reasons for exercising (ACT-WR), those exercising for non-weight related reasons (ACT-NWR), and those not exercising (INACT).

Methods: A total of 1581 adult women (age: 45.5 ± 3.2 yr; BMI: 26.3 ± 5.9 kg/m²), participating in a nationally representative survey in New Zealand, fulfilled a psychometric battery of questionnaires assessing intuitive eating (i.e., reliance on hunger/satiety cues, unconditional permission to eat, and eating for physical rather than emotional reasons) and eating-related motivational regulations. Analyses of variance were conducted.

Results: ACT-NWR participants reported higher levels of intuitive eating compared to ACT-WR ($0.29 < d < 0.72$; all $ps < 0.05$) and INACT ($0.29 < d < 0.31$; $ps < 0.05$). In general, ACT-WR participants presented the lowest scores on intuitive eating variables. Regarding motivations to regulate eating, ACT-WR showed the highest levels of autonomous motivation ($0.27 < d < 0.78$; $ps < 0.05$), and introjected motivation ($0.29 < d < 0.61$; $ps < 0.05$). ACT-NWR (vs. INACT) participants also reported higher levels of autonomous motivation ($d = 0.50$; $ps < 0.05$). External motivation was not substantially different between ACT-WR and INACT, but it was higher than in ACT-NWR participants ($0.26 < d < 0.40$; $ps < 0.001$). INACT participants presented the lowest levels of autonomous motivation and the highest levels of amotivation ($0.52 < d < 0.54$; all $ps < 0.05$).

Conclusions: Being active to lose weight appears to be associated with the highest motivation levels, but not necessarily the best motivation quality, since both autonomous and controlled motivations are higher in these individuals. An intuitive eating style (more reliant on physiological signals), which has been shown to facilitate weight control, is also reduced in this group. Interestingly, being active for non-weight related reasons may facilitate weight control, as it appears to be linked to a more intuitive eating style and better motivation quality.

PO.14

PHYSICAL ACTIVITY PROFILE OF PREGNANT WOMEN WITH AND WITHOUT GESTATIONAL DIABETES IN URBAN INDIA

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Moderate levels of prenatal physical activity have been shown to improve maternal and fetal outcomes in pregnancy. There is little data on the physical activity levels of pregnant women in India, and even less so on women with gestational diabetes mellitus (GDM). We therefore attempted to assess the physical activity profile of women with and without GDM in Chennai, the largest city in south India.

Methods: As part of the ongoing **Women in India with GDM Strategy (WINGS)** programme, 770 pregnant women (174 with GDM and 596 without GDM) from any of six maternity centers were administered a culturally relevant, validated questionnaire for use in India called the Madras Diabetes Research Foundation(MDRF)- Physical Activity Questionnaire(MPAQ) at their booking(baseline) visit. GDM was diagnosed using the World Health Organization(WHO) criteria. Participants were categorized into sedentary, moderate and vigorous activity levels based on their physical activity level(PAL) scores.

Results/ findings: The mean age, gestational age and BMI of the participants screened were 27.0 ± 4.0yrs; 17.8 ± 6.6 weeks; 24.8 ± 5.0 kg/m² respectively. Based on PAL scores, it was found that 73.0% of all the pregnant women were sedentary and 26.9% were moderately active with no differences between those with and without GDM. On an average day the mean minutes spent being inactive was significantly higher than active in all domains(work domain-268.8 ± 102.6 vs 97.3 ± 83.3 min/day; activities of daily living:254.7 ± 94.9 vs 135.5 ± 97.5 min/day; and recreation:175.0 ± 113.0 vs 45.9 ± 54.9 min/day) except transport(25.4 ± 36.4 vs 42.4 ± 40.3 min/day). On average, women reported watching 175.3 ± 99.8 minutes of TV per day. Only 15% women reported walking as an exercise(29.5 ± 15.4 min/day). There were no differences in activity patterns between women with and without GDM.

Conclusions: Pregnant women(both with and without GDM) in urban India have a very high prevalence of sedentary behavior with most of their activity coming from work and activities of daily living. Increasing awareness about the need for improving physical activity levels in general and recreational activity in particular could help improve pregnancy outcomes in this population.

PO.15

How do home food availability, parental modeling and feeding practices work together to influence adolescent dietary intake?

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 University of Minnesota, Minneapolis, MN, USA

SIG: Yes, Children and families

Awards:

Purpose: Research has demonstrated that parents can positively influence their children's dietary intake by providing healthy foods at home, modeling healthy food choices and using of non-controlling feeding practices. The objectives of this study were to: 1) examine individual associations between aspects of the family eating environment (home food availability, parental modeling, and food control) and adolescent dietary intake and 2) explore associations between different profiles, reflecting these aspects of the family eating environment in combination, and adolescent dietary intake in order to identify what matters most and how different aspects of the environment work together.

Methods: Adolescents [mean age=14.4 (SD = 2.0), XX% ethnic/racial minority] and their parents (N=2383 dyads) participated in two coordinated, population-based studies in Minneapolis/St. Paul, Minnesota during 2009-2010. Adolescent participants completed surveys food frequency questionnaires, and anthropometric measurements at school. Parent participants completed surveys by mail or phone.

Results: Home healthy food availability was positively associated with fruit/vegetable intake and negatively associated with sugar-sweetened beverage and palatable snack food intake. Parental modeling of healthy food choices was negatively associated with sugar-sweetened beverage consumption. Food control was positively associated with palatable snack food intake. Examination of dietary intake across family eating environment profiles revealed that consumption of fruits/vegetables was driven primarily by home food availability. Parental use of high food control was not associated with consumption of fruit/vegetables, but was associated with greater consumption of sugar-sweetened beverages and palatable snack foods.

Conclusions: Findings indicate that among the aspects of the family eating environment explored here, making healthy food available at home was most consistently associated with markers of healthy dietary intake in adolescents. Further, given that high food control was not associated with fruit/vegetable intake, but was associated with greater sugar-sweetened beverage and palatable snack food intake, parents should be encouraged to support their adolescent in developing self-regulation of food intake.

PO.16

The Consumption of Energy Drinks Amongst 14-17 Year Old Danish Adolescents: An Examination of the Top Two Energy Drinks Consumed by this Target Group.

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SIG: Yes, Policies and environments

Awards:

Objective: To examine the prevalence of energy drink (ED) consumption amongst 14-17 year-old Danish adolescents and determine the top two brands consumed by this target group. Furthermore, to test the hypothesis being that acute consumption of ED pose a risk of exceeding the maximum recommended intake (MRI) for caffeine and recommended daily intake (RDI) for vitamins B6 and B12 amongst 14-17 year-olds when dietary intake is considered. The study innovatively emphasizes dietary intake of the substances, since these have previously been disregarded in other studies.

Methods: Findings are based on data from the descriptive cross-sectional study; 'Consumption of energy drinks among 10-35-y-old Danes' conducted by the Danish Technical University of Food (2014). Data was collected through a web-based FFQ where participants (n=757) were required to register all alcoholic and nonalcoholic beverages and chocolates consumed within the recent month. Descriptive statistics were used to describe overall prevalence of consumption. Nutrient profiling of the top two ED were applied to three different defined consumer groups to determine whether acute consumption could result in overconsumption of either caffeine or vitamins B6 and B12.

Results: Prevalence of ED consumption amongst 14-17 year-old Danish adolescent was 34% (n=259) within the recent month, with Red Bull™ (27%, n=141) being the number one priority brand followed by Monster™ (11%, n=56). Based on three defined consumer groups findings suggest that acute consumption of ED pose a risk of exceeding both MRI for caffeine and RDI for vitamins B6 and B12.

Conclusions: Despite findings it is concluded that the content of vitamins B6 and B12 present in ED are not a concern nor are related adverse health effects however, further research is needed. Based on findings and due to the well-known adverse health effects of caffeine, focus should remain on this substance for future public health policy initiatives. Front-of-package-labeling (FOP) was proposed as primary prevention strategy to potentially limit sales and thereby reduce consumption of ED amongst adolescents. However, no studies have yet examined to what extent FOP-labels have an effect on the consumer decision-making process in adolescents. More mandatory regulations imposed by the government should be considered.

PO.17

Co-participation in physical activity and mothers' and young children's objectively assessed physical activity levels

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SIG: Yes, Children and families

Awards:

Purpose:

Identifying common correlates of physical activity amongst multiple family members may be useful for increasing this behavior within families. This study aimed to identify the prevalence of mother-child co-participation in physical activity and the association between co-participation and physical activity levels of young children and their mothers.

Methods:

One-hundred twenty-three 4-6 year-old children and their mothers were recruited from preschools in Belgium between November 2010 and January 2011. Mothers completed a questionnaire assessing the frequency of co-participation in five activities relevant to families with young children. Both mothers and children wore ActiGraph GT1M accelerometers concurrently for minimum 7 days to assess the time spent in moderate-to vigorous-intensity physical activity (MVPA). Separate linear regression analyses examined the association between co-participation and mothers' and children's MVPA on weekdays and weekends.

Results/findings:

Most mothers reported infrequent co-participation in physical activities with their children. On weekdays, walking or cycling for short trips was positively associated with children's MVPA while attending a park or similar more than once per month was negatively associated with children's MVPA. No associations were observed between any co-participatory variable and mothers' MVPA. On weekends, walking or cycling with their child in their free time was positively associated with both children's and mothers' MVPA. Going to an indoor play centre together 1-3 times/month was associated with lower MVPA in children.

Conclusions:

Reported rates of co-participation in physical activity amongst mothers and their preschool children are low. The association with maternal and child MVPA may be dependent on the co-participatory behaviour assessed and may differ between weekday and weekends. Promoting walking and cycling together may be an effective strategy to increase both mothers' and children's MVPA.

PO.18

Relation between obesity and physical activity: a study of urban adolescent girls in West Bengal, India

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective:

To explain the relationship between the incidence of obesity and physical activity among adolescent girls.

Methods:

The present cross-sectional study involved 1619 adolescent girls aged 14-19 years from 15 higher secondary schools of Kolkata and Howrah, West Bengal, India. Physical activity was assessed using a structured questionnaire showing various activities performed daily and reported in minutes on a weekly basis. The incidence of obesity was measured using anthropometric indices like, body mass index (BMI), waist hip ratio (WHR), waist height ratio (WHT), conicity index (CI), arm fat area (AFA) and percent body fat (PBF). Canonical correlation analysis (CCA) was conducted to show the relationship between predictor and criteria variables. Physical activity variables and the incidence of obesity were used as predictor and criterion set respectively.

Results:

The results of CCA show that first canonical function shared 50.99% of total variance. The first canonical correlation was 0.301 ($p < 0.001$) demonstrating a moderate correlation between the incidence of obesity and physical activity variables. Loadings of function 1 indicate that the most important indicators of obesity were BMI, WHT, AFA and PBF and the most relevant variables defining physical activity were watching television, listening music, using computer, newspaper and magazine reading, regular study, physical exercise and commuting related to studies. Only physical exercise and commuting related to studies showed negative relationship with the indicators of obesity.

Conclusion:

The types of activities performed usually by urban adolescent girls remain unfavorable to combat obesity.

PO.19

Outcomes of a workplace biofeedback physical activity intervention aimed at customer service and call-centre employees.

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SIG: Yes, Policies and environments

Awards:

Objective:

Office-based workers represent the single largest occupational group in Australia. The adverse health outcomes associated with physical inactivity, sedentary behaviour and workplace sitting puts this group at greater risk of chronic disease. Interventions implemented in these settings have a potential high reach amongst diverse populations at greater risk of poor health. This study aimed to assess the impact of a workplace biofeedback physical activity intervention among office-based employees.

Methods:

The study was a non-randomised controlled trial based in Geelong, VIC, Australia. The intervention group (N=221) received Fitbit activity trackers, motivational messages and online goal-setting for 10-weeks. The control group (N=127) received pedometers only. Objectively assessed physical activity was measured daily using step count data. Secondary outcomes included blood pressure, waist circumference and self-reported chronic disease risk factors measured at baseline, midpoint and immediately post intervention.

Results:

Total weekly step count and was significantly higher in the intervention (N=209, M=40.1 years, 77% female) than the control group (N=37, M=43.6 years, 84% female) across all 10 trial weeks. Adjusted mean difference in total weekly steps at weeks 1 and 10 increased in the intervention group by 2,504 steps/week and decreased in the control by -3,738 steps/week. Adjusted mean difference in total weekly steps in the intervention group was not significant between weeks 1 and 10 (95% CI: -6,682 to 31,673, $p = .238$); suggesting that their increased step count was retained from baseline to end point. There were no significant differences in secondary outcome measures in either group.

Conclusions:

Physical activity biofeedback combined with motivational messages and online goal-setting may be a more effective way to improve the physical activity levels of office-based workers than via physical activity trackers alone. In response to increased consumer demand for digital health technologies, strategies which incorporate online health promotion platforms within health promoting environments may be more likely to improve workplace physical activity behaviours. As part of a suite of interventions to increase physical activity and reduce sedentary behaviour, the relatively low cost and portable nature of physical activity trackers make them a potentially effective tool in which to reach large populations in a workplace setting.

PO.20

Barriers to a Mediterranean diet in a Northern European population

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective:

Strong evidence links consumption of the Mediterranean diet (MD) to a reduced risk of CVD and type II diabetes, however there is uncertainty about whether non-Mediterranean regions will adopt this dietary pattern. General barriers to dietary change are well documented in the literature, but there is limited information on the specific barriers that may exist in relation to adoption of a MD by Northern European populations. This research aimed to investigate attitudes towards a MD in individuals at high CVD risk in a Northern European population.

Methods:

A qualitative methodology using focus group discussion was undertaken. Focus groups (n=12) were held with the target group and explored awareness of a MD, attitudes towards key MD components and barriers to dietary change towards a MD. Discussions were audio-recorded, transcribed verbatim and analysed thematically by two researchers independently. Quotations were used to represent views. Nvivo qualitative indexing software was used to manage the coded data.

Results:

Sixty-seven high CVD risk adults (60% female, mean age 64 y) took part. Participants were aware of the MD and associated it with a hot climate and foods including olive oil, salads, pasta and wine, but knowledge of the specific composition of a MD was limited. Several barriers to following a MD were identified, most of which were similar to barriers associated with general healthy eating, such as cost, availability of key MD foods, lack of knowledge, lack of cooking skills and taste. However, further barriers specific to following a MD were identified, including food specific barriers, culture, climate and negative perceptions of the body image of those from the Mediterranean region.

Conclusions:

This research indicates that although there was good awareness of the term MD in this Northern European sample at high CVD risk, knowledge of the specific composition of a MD was limited. In addition to the usual barriers to dietary change, a number of barriers specific to a MD were identified. Interventions to encourage adoption of a MD in non-Mediterranean populations will need to ensure appropriate education and support is provided to address these knowledge gaps and barriers.

PO.21

School health programming improves dietary intakes, physical activity and fitness levels of grade 6-8 Indigenous youth from a community in northern Ontario, Canada

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SIG: Yes, Policies and environments

Awards:

Objectives: In a remote Indigenous (First Nations) community in northern Ontario, Canada, we assessed the impact of school health programming on the diets, physical activity (PA) and fitness of grade 6-8 youth, and elucidated impediments and facilitators to program sustainability.

Methods: The First Nations-administered school began a healthy food provision program in 2009, and after-school sports were incorporated in 2012. At baseline, diets were measured via 24-hour recalls (2009) and PA was measured via accelerometry over three school days (Fall 2012). Fitness was measured using the 20-m shuttle run and standard field tests following the Canadian Physical Activity, Fitness and Lifestyle Approach. All measures were repeated in June 2013. Changes in diet, PA and fitness were assessed via t-tests, or Chi-square tests, using a level of significance of $p < 0.05$. Student and staff focus groups and semi-directed interviews were used to elucidate impediments and facilitators to program sustainability. Qualitative data were analyzed inductively by hand and summarized.

Results: After four years of food provision, youth (n=49, 12.7±1.0 years, 59% male) consumed more vegetables and fruit ($p=0.048$), milk and alternatives ($p=0.017$), 'other' foods ($p=0.030$), carbohydrates ($p=0.025$), fibre ($p=0.019$), thiamine ($p=0.040$), riboflavin ($p=0.008$), folate ($p=0.006$), calcium ($p=0.015$), iron ($p=0.046$), potassium ($p=0.007$), zinc ($p=0.042$) and kilocalories ($p=0.021$) compared to baseline (n=43, 13.1±0.9 years old, 60% male). Following one year of after-school sports (n=57, 12.8±1.0 years, 60% male), moderate-to-vigorous PA increased by 50.8 minutes/day ($p=0.040$) and cardiorespiratory endurance by 2.5 mL/kg/minute ($p=0.035$) for boys. Boys and girls improved their muscular strength by 8.2 kg ($p<0.001$) and 5.6 kg ($p=0.016$), respectively. Impediments to sustainability included having few resources, limited staffing and inconsistent funding, though many mitigating strategies were developed. Community ownership, the presence of local advocates and champions, and local government support were identified as important facets of longer-term program maintenance.

Conclusions: School health programming was sustainable in a northern First Nations community with relatively few pre-existing resources. As compared to baseline, the physical fitness, PA levels and diets of youth improved, meeting or moving towards Canadian standards. Further development and support of existing programming will be necessary to further impact these measures of health.

PO.22

Pre-service teachers' views on factors facilitating school-time physical activity of primary school children

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: School represents an important setting for promoting children's physical activity (PA). School-time PA in children may be influenced by various factors. Among these, physical education (PE) teachers play an essential role. Thus, this study explored the perceived facilitators of PA within the primary school environment by pre-service PE teachers.

Methods: Thirty eight pre-service PE teachers studying in a university in Hong Kong were interviewed using the Nominal Group Technique (NGT) in four groups. The question proposed during the NGT interviews was "What school environmental factors (including built environments, e.g. sports facilities; social environments, e.g. support from teachers; policy environments, e.g. physical activity related policies) do you think make the students to do more physical activity in school setting?" Responses were prioritized by the participants in order of the perceived importance to children's PA.

Findings: A total of 14 PA facilitators were identified by the pre-service PE teachers; 8 items regarding the school policy (School valuing and promoting PE, PA-related extracurricular activities, School providing individualized sports training for students, Active morning recess, Financial support to students, PE with various contents, Longer PE/recess duration, and School's sports tradition), 4 items regarding school social environment (Peers' accompany, Peers' influence, Parental support, and Teacher's encouragement), and 2 items regarding school built environment (School space and Availability of open area).

Conclusion: Specific PA facilitators within the primary school environment were identified by the pre-service PE teachers. The findings of this study can inform future epidemiological investigations and foster PA intervention studies targeting the school environment.

PO.23

Cardio respiratory fitness not physical activity predicts body fat percent in English children.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

The association between physical activity (PA) and body fat (BF) has been widely reported in the literature, and cardio respiratory fitness (CRF) has been shown to be a predictor of percent BF in childhood. This study aimed to examine whether the association between BF and PA in children becomes more positive when accounting for CRF.

Methods:

137 English children (48 boys and 89 girls, age 11-14 years) completed self-report PA questionnaires to establish average daily energy expenditure. CRF was measured using the Multistage Fitness Test (MSFT) from which VO_2 peak was estimated. BF percent (%BF) was determined from measures of height (cm) weight (kg), and skinfolds. Multiple linear regression analysis was used to predict %BF based on VO_2 peak and PA.

Results/findings:

All assumptions were met prior to linear regression analysis. The results of two simple linear regressions with %BF as the dependent variable suggested that VO_2 peak was a significant predictor ($F(1, 135) = 23.69, p < .001$, Adjusted $r^2 = .143$; %BF = $41.36 + \text{VO}_2 \text{ peak} * -.499$) and that PA was a poor predictor ($F(1, 135) = .174, p = 0.678$, Adjusted $r^2 = -.006$) of %BF. The result of a multiple regression that included both VO_2 peak and PA was also significant ($F(2, 134) = 13.091, p < .001$), the inclusion of these variables explained greater variance in %BF than VO_2 peak alone (Adjusted $r^2 = .151$; %BF = $34.25 + \text{PA} * .215 + \text{VO}_2 \text{ peak} * -.532$). Additional assumptions for multiple regressions were met with satisfactory collinearity ($\text{VIF} = 1.045$).

Conclusions:

CRF is a more important individual predictor of BF in children than PA, and the association between PA and BF can be better explained when accounting for CRF. Therefore, PA which improves CRF is advocated. Future research may explore whether similar patterns exist when PA is objectively measured, CRF is directly assessed, and common measures of weight status are used.

PO.24

A feasibility study to reduce sedentary behaviour in frail older adults using activity monitors with real time and follow-up feedback

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SIG: Yes, Motivational Dynamics

Awards:

Objective: An intervention was developed using activity monitoring technology to give older adults feedback on their sedentary behaviour.

Method: Participants were recruited from sheltered housing complexes and GCU Older Adults Research Database. The participants were randomized into two groups. Both groups had monthly feedback on their activity from the activity monitor output and a face-to-face discussion about their sedentary time. One group had the addition of real-time feedback on their sedentary behaviour (SB), by the addition of a vibrational device within their activity monitor (VTap). Primary outcome was SB characteristics (objective monitor by ActivPAL technologies) and secondary outcomes were physical function and self-reported health and well-being. The results were analysed using Mixed Model Analysis.

Results: 36 participants were recruited, 23 of these entered week one of the study and 12 completed to 3 month follow-up. The dropout rate is reflective of the frailty of the older adults recruited for this study. There was a difference between groups, the VTap group tended to display more favourable outcomes at baseline and throughout the study. Pre compared to post study (at 2 months) there was no significant effect of reducing SB Ratio (% of waking day) or increasing fragmentation (bout of sitting per hour). Significant difference were seen in some of the secondary outcomes, namely timed up and go scores and as did sit to stand scores improved across both group with no significant effect of the group. Other secondary outcomes showed no significant effect.

Conclusions: The frailty of this group made retention of numbers difficult. Despite this, reducing SB looks to have a beneficial effect on functional outcomes of sitting, one's ability to rise from the chair and move. Further work is required to define what individual are best to include in such an intervention.

PO.25

Pilot study about the calibration and validation of cut-off points for accelerometers in water activities

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective:

It is known that physical activity (PA) brings health benefits. Precise quantification of PA, regarding intensity and duration, acquire central importance when PA habits and health is being observed. Different methods for this purpose are available, among which stands out accelerometers (ACLs).

The wGT3X-BT units (Actigraph Corporation) are the most widely used for research in this area, and the potential of using those units in the water, will probably bring new insights into the research field.

This study has the primary aim to establish associations between counts per minute (CPM) and METs, in water activities, which seems to be a smart idea for a brand new technology.

Methods:

Participants (15 subjects, mean age 22,2, 9 males) were submitted to an incremental speed swimming protocol test, for front crawl, with increments of 0.05 m.s⁻¹ each 200-m stage (4-7 stages) without intervals until exhaustion, according to protocols already applied by one of the researchers.

We have used the k4b2 (Cosmed) for the intensity evaluation, and 2 ACLs were used in the wrist and 2 in the waist, with epochs of 5 sec. to match k4b2 outputs.

Data from k4b2 and ACLs were matched every 5 sec. in order to proceed with the final analysis. Pearson correlations were established between METs, waist vector magnitude CPM (VMWCPM), wrist vector magnitude CPM (VMWrCPM).

Results:

As main results we can see low to moderate correlations between METs and VMWCPM ($r=0,431$; $p<0,05$) and METs with VMWrCPM ($r=0,133$; $p<0,05$). Those results suggest that when swimming there's a better chance of prediction using the VMWrCPM. These results also suggest the need to establish specific cut-off points to be used in water activities, and also the validity of currently used cut-off points used for wGT3X-BT units to establish different intensities in water activities, similar to "land" activities.

Conclusions:

Further studies using different populations, and a bigger sample is needed in order to establish new regression equations to establish adequate calibration and/or validation of currents cut-off points for water activities, particularly swimming.

PO.26

Evaluation of a Theory-based Intervention Aimed at Reducing Intention to Use Restrictive Dietary Behaviors Among Adolescent Female Athletes

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The purpose of this study is to evaluate the effectiveness of a theory-based intervention to reduce the intention to use restrictive dietary behaviors for losing weight in adolescent female athletes involved in aesthetic sports.

Methods: Aesthetic sport teams of adolescent (age 12-17) female athletes were recruited for this cluster randomized controlled trial. Two teams (N=37 athletes) were assigned to the experimental group and three teams (N=33) were assigned to the control group. Three 1-hour weekly sessions focusing on nutrition information were provided to both groups. Unlike the control group, the experimental group also received a theory-based intervention targeting a specific determinant of intention to use restrictive dietary behaviors for losing weight, which had been identified in a previous study (i.e. attitude). Primary outcome was change in intention to use restrictive dietary behaviors for losing weight over time. Secondary outcomes included change in nutrition knowledge with the intervention. Mixed model analyses for repeated measures were used.

Results: Intention to use restrictive dietary behaviors for losing weight among adolescent athletes was not highly prevalent at baseline. The theory-based intervention in the experimental group contributed to maintain the low prevalence of this behavior over time compared to the control intervention ($P_{\text{tx} \times \text{time}}$ interaction=0.03). The intervention was effective in increasing nutrition knowledge in both groups, with no difference between groups.

Conclusion: Complementing a nutrition information intervention with a theory-based behavior change intervention may have a positive effect on reducing the intention to use restrictive dietary behaviors for losing weight in high-school female athletes involved in aesthetic sports.

PO.27

Body Image Discrepancy and Social Physique Anxiety, a link to Physical Activity Participation in Preadolescents

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Various psychological and social influences contribute to youth choices regarding their physical activity participation. With the rise in childhood obesity levels and the decrease of physical activity in youth, it is critical to research potential predictors to or barriers of physical activity. This study examined how relationships exist between body image discrepancy, social physique anxiety and physical activity levels in preadolescent children and then examined how BMI related these variables. Research in these areas has not been explored in this age group.

Methods:

A cross-sectional study of 174 children (94 boys, 80 girls) from ages 8-12 participated. Measurements included calculated BMI, and questionnaires of social physique anxiety, body image discrepancy, and physical activity levels. The study used both correlational and multiple regression analyses to evaluate the relationships between the independent variables: body image discrepancy, social physique anxiety levels, and weight status (BMI), and the dependent variable of physical activity level.

Results/Findings

Results indicated that overweight and obese youth compared to their normal weight peers exhibited significantly higher levels of both body dissatisfaction and social physique anxiety. Correlational statistics also revealed significant relationships between BMI and both body image discrepancy and social physique anxiety. Social physique anxiety showed to be significantly correlated to both body image discrepancy (positive correlation) and physical activity (negative correlation). Finally, multiple regression analysis showed that social physique anxiety was the only significant individual predictor of physical activity.

Conclusions:

Overall, this study provided novel research of social physique anxiety in youth younger than age 12 and revealed that the anxiety experienced during the social aspect of moving one's body can decrease physical activity in children as early as age 8 years old. Additionally, this study showed how these self-presentational concerns are exacerbated by higher obesity levels. This research supports prevention and intervention efforts at earlier ages to combat the deleterious effects of self-presentational concerns to promote early and lifelong involvement in physical activity.

PO.28

Overweight, nutritional intake and physical activity in inmates

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

To determine associations between overweight (OW), physical activity (PA) and nutritional intake (NI) in a sample of 50 inmates.

Methods:

We calculated and categorized body mass index according to the classification of the World Health Organization (WHO), and grouped men with OW and obesity in a single category (OW) for comparative analysis with the group without OW. To assess NI we used a food frequency questionnaire validated for the Portuguese population, and determined the prevalence of nutritional inadequacy based on WHO recommendations and Food and Nutrition Board. To assess the PA the inmates used for 7 consecutive days one accelerometer (GT1M from MTI Actigraph); the PA was categorized in Sedentary (SPA), Light (LPA), Moderate (MPA), Vigorous (VPA) and Moderate+Vigorous (MVPA).

Results/findings:

Valid data was obtained in 47 subjects (all men, age 38,3 ± 12,5 years; body mass index 24,0 ± 3,2).

For total energy intake, the OW group ingested more calories. The abdominal perimeter was higher in the OW group, difference statistically significant ($p < 0,05$). Prevalence of inadequacy above 90% for fiber, vitamins E, D, K was observed. We found statistical difference for the prevalence of inadequacy for zinc ($p < 0,05$). Statistical difference was found for VPA ($p < 0,05$).

Conclusions:

The prevalence of OW was low. All inmates have less than the recommended intake of fiber, vitamins E, D and K. We found significant differences for the prevalence of inadequacy for zinc. Regarding PA, statistical difference was found for VPA (higher in the OW group), but nevertheless, they also ingested more energy. Due to the lack of studies in this area our findings should be viewed as a starter to better study this specific population.

PO.29

Perceived Social Support from Friends and Parents for Healthy and Unhealthy Eating and Diet Quality among Low-income, Minority Youth

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SIG: Yes, Children and families

Awards:

Purpose: Evidence of associations between social support and dietary intake among adolescents is mixed. This study examines associations between social support for healthy and unhealthy eating from friends and parents, and diet quality in a sample of minority youth.

Methods: This study is a cross-sectional analysis of survey data. Trained data collectors obtained this information during in-person interviews with a random sample of youth from 14 low-income neighborhoods in Baltimore City, Maryland, USA. Respondents included 296 youth (ages 9-15 years, 53% female, 91% African American) who were participating in the B'More Healthy Communities for Kids multi-level obesity prevention intervention. Assessment measures included: diet quality measured using the Healthy Eating Index 2010 overall score (calculated from the Block Kids Food Frequency Questionnaire), social support for healthy and unhealthy eating from parents and friends (measured on 3-4 item Likert scales), age, gender, race, and household income. Adjusted multiple linear regressions were used to determine the associations between diet quality and friend and parent support for healthy and unhealthy eating. Alpha was set at $p < 0.05$.

Results/findings: The mean Healthy Eating Index score for the sample was 55.5 (standard deviation=9.6), which is slightly higher than a national sample of U.S. youth. Higher levels of parent support for unhealthy eating were associated with lower overall HEI scores ($\beta = -0.67$; $SE = 0.24$; $CI: -1.14$ to -0.20 ; $p = 0.01$). Friend support for unhealthy eating reached marginal statistical significance in an unexpected direction ($\beta = 0.34$; $SE = 0.20$; $CI: -0.05$ to 0.72 ; $p = 0.09$), indicating that higher friend support for unhealthy eating may be associated with higher diet quality. Friend and parent support for healthy eating were not statistically significantly associated with overall HEI scores.

Conclusions: The results presented here indicate that there may be important dynamics occurring between youth, and their parents and friends related to support for unhealthy eating behaviors that are associated with differences in diet quality. These findings may be relevant to researchers and practitioners as they develop family- and peer-based nutrition interventions.

PO.30

Narrative increases step counts during active video game play among children

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Active video games (AVGs) capable of inducing physical activity (PA) level offer a novel alternative to child obesity. Unfortunately, children's motivation to play AVG decreases quickly, underscoring the need to find new methods to maintain their engagement. According to narrative transportation theory, the more a narrative immerses a person into a story world, the more consistent their beliefs and behaviors should be with that narrative. Narratives may be an important method of motivating continued game play, but their role in AVGs has not been explored. As the first study to systematically explore narrative's effect on children's AVG play, this project addressed two research questions: 1) Will players' cognitive and affective evaluation and motivation to play be more positive for a narrative than a nonnarrative version of an AVG? 2) Will a narrative version of an AVG result in a higher PA level?

Methods:

Forty overweight and obese children (Male = 50%) 10 to 12 years of age played Nintendo Wii Sports Resorts: Swordplay Showdown. Half (N=20) watched a narrative-based video trailer (developed for the game and tested among children previously) before the game play. The other half (N=20) played the game without viewing the narrative trailer. Children were instructed to play as long as they would like. Demographic information, psychosocial variables (the immersion, identification, motivation etc. scales), and PA (via ActiGraph wGT3X-BT) were recorded and analyzed.

Results/Findings:

Children in the narrative group had significantly ($p < .05$) more steps during play in terms of the average number of steps per 10s period ($M=3.2$, $SD=0.7$) and in total ($M=523$, $SD=203$) across the entire play period when compared with the non-narrative group ($M=2.7$, $SD=0.7$) ($M=366$, $SD=172$). Other than a higher immersion score for the narrative group, no significant difference in psychosocial variables was observed. These findings should be taken with caution as many variables showed low internal consistency.

Conclusions:

Narrative increased PA in children playing an AVG as evidenced by increased step counts. More child-appropriate measures should be developed and validated to measure engagement in narrative-based media. More studies should explore story immersion to maximizing AVG's intervention outcomes.

PO.31

Who uses the Internet for nutrition and dietary information? Population trends in Western Australia from 1995 to 2012

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SIG: Yes, e- & mHealth

Awards:

Purpose: To assess the change in prevalence and demographic characteristics of adults who use the Internet as a source of nutrition and dietary information to provide essential information on commonly used sources in Australia.

Methods: Data were pooled from the Department of Health in Western Australia's three-yearly Nutrition Monitor Survey Series telephone survey of 7,044 18 to 64 year olds between 1995 and 2012. Outcome variables were the main sources of nutrition and dietary information used in the last year and responses to 'What would make it easier for you to eat a healthy diet?' Sociodemographic variables were collected. Descriptive statistics report the prevalence of Internet usage. Binary logistic regression was used to analyse the association between Internet use for nutrition information and sociodemographic characteristics.

Results/findings: The proportion of respondents using the Internet as a source of nutrition and dietary information increased from less than 1% in 1995 to 2001, to 9.1% in 2004 and 33.7% in 2012. Logistic regression shows that compared to 2004, the odds of using the Internet for this information increased significantly in 2009 (odds ratio [OR] 2.84), and 2012 (OR 5.20, $p < .001$). Respondents using the Internet as a source were more likely to be female (OR 1.30, $p = .02$), live in a metropolitan area (OR 1.26, $p = .03$), born in countries other than Australia/UK/Ireland (OR 1.41, $p = .02$), more educated (OR 2.46 for university educated, $p < .001$), and younger ($p < .001$). A high proportion of respondents agreed information on: more ways to prepare healthy foods (72.0%, CI 70.7,73.3); quicker ways to prepare healthy foods (79.0%, CI 77.8,80.1); selecting healthy foods (68.8% CI 67.5,70.1); and cooking (54.7%, CI 53.3,56.1); would assist them to make healthier choices. Respondents using the Internet as a source were significantly more likely than non-users to want to know quicker ways to prepare healthy foods (83.0% versus 78.1%, $p = .005$) and information on selecting healthy foods (76.3% versus 67.3%, $p < .001$).

Conclusions: The Internet provides an ideal platform to reach information-seekers with nutrition and dietary interventions. Health promoters should tailor Internet interventions to meet the target population's needs, using credible, reliable and practical information.

PO.32

Compensatory prolonged sedentary time with increased walking during mid-pregnancy

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SIG: Yes, Children and families

Awards:

Purpose: Prenatal physical activity (PA) benefits mother and child, yet <25% of women meet current PA guidelines. Furthermore, pregnant women spend >70% of their day in sedentary behaviors that can contribute to negative health outcomes. The purpose of this study was to evaluate a behaviorally-based PA intervention on walking time and sedentary behaviors (SB) in inactive pregnant women.

Methods: Forty-four pregnant women completed a randomized-controlled trial to increase walking. Women were randomized to usual care (UC; n=21) or intervention (INT; n=23) prior to week 14 of pregnancy. Key constructs (self-efficacy, self-regulation, and social support) from the Social Cognitive Theory were incorporated into an on-line website used to deliver the intervention. Objective PA (stepping and sit/lie) was assessed using the activPAL, a postural allocation monitor at baseline, mid- (week 26), and late-pregnancy (week 35) over 7 consecutive days. Walking (total, ≥10 minutes, ≥20 minutes) and SB (total, ≥30 minute, ≥60 minute, % of day standardized for wear time) were compared between groups with one-way ANOVAs.

Results: Groups were not significantly different in demographic characteristics, pre-pregnancy BMI, or baseline levels of walking/SB. Intentional walking (defined as bouts ≥20 minutes) for INT was greater at mid-pregnancy (p<0.01) and late-pregnancy (p=0.07). Walking (bouts ≥10 minutes) was greater for INT vs UC at mid-pregnancy (P=0.002) but not late-pregnancy. There were no group differences in total walking time or SB variables at mid- or late-pregnancy (p>0.05). Women with increases in intentional walking (WALK; n=10) compared to women without increased intentional walking (NOWALK; n=32) spent more of their day in sedentary time (WALK: 70.9% ± 2.4; NOWALK: 65.4% ± 7.8; P=0.026) and accumulated more sedentary time in bouts ≥30 minutes (WALK: 371.8 minutes/d ± 37.0; NOWALK: 285.7 minutes/d ± 20.4; P=0.024) at mid-pregnancy. No differences in SB were apparent at late-pregnancy.

Conclusions: A behaviorally-based PA intervention increased intentional walking in inactive pregnant women. Notably, women with increased sustained walking bouts also increased sedentary time including prolonged bouts of sitting suggesting that increased PA was compensated with increased sedentary time. Future prenatal lifestyle interventions should emphasize intentional walking plus shorter sitting bouts to promote a healthy pregnancy.

PO.33

Prevalence and socio-economic distribution of eating, physical activity and sedentary behaviour among Australian children in urban and rural communities: An OPAL baseline Evaluation

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SIG: Yes, Policies and environments

Awards:

Objective: Diet, physical activity and sedentary behaviours are modifiable lifestyle factors associated with overweight and obesity in children. Dietary and physical activity guidelines are provided by health departments to assist in reducing the risk of non-communicable diseases, including obesity. This study aims to describe the prevalence of Australian primary school children meeting recommended guidelines for eating, physical activity and sedentary behaviour.

Methods: Cross-sectional survey of 4637 children in years 3-6 (aged 9-11 years) enrolled in the Obesity Prevention and Lifestyle (OPAL) program in metropolitan and rural South Australia. Self-reported eating (fruit, vegetables, discretionary food), physical activity and sedentary behaviours were assessed using validated items administered via questionnaire and children were classified as meeting or not meeting each guideline. A multilevel mixed effect logistic regression model was adopted to explore the variation in children's eating, physical activity and sedentary behaviours between gender, age, locality and socio-demographic status, using ICSEA (Index of Community Socio-Educational Advantage) scores.

Results: Although 3 in 5 (64%) children reported consuming ≥2 serves of fruit, only 1 in 5 (21%) met the guidelines of consuming ≥4 serves of vegetables per day. More than half (56%) of children consumed ≥2 serves of discretionary food. Only 17% children met the guidelines of ≤2 hours of screen time usage and 33% participated in ≥60 minutes of exercise per day. In the mixed effect logistic regression model, girls were less likely (OR=0.85; 95% CI 0.74-0.99; P=0.03) to meet vegetable and physical activity guidelines (OR=0.74; 95% CI 0.65-0.84; P<0.001), yet almost 19% more likely to meet fruit recommendations and 34% more likely to meet screen time recommendations, than boys. Rural children were more likely to meet both physical activity (OR=1.45; 95% CI 1.21-1.74; P<0.001) and screen time recommendations (OR=1.37; 95% CI 1.14-1.66; P<0.01) than urban counterparts. Children at least socio-economic disadvantage performed better than those at greatest disadvantage with regards to healthy eating, physical activity and sedentary behaviours.

Conclusions: There is considerable scope for improving Australian primary school children's health-related behaviours to be in line with national dietary and physical activity guidelines, particularly in urban children and those at greatest disadvantage.

PO.34

Improving the Swimming Capability of Danish Children

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

A recent report shows that 51% of Danish children at the age of 7-14 are not able to swim a 200-meter distance (YouGov & The Danish Swimming Union, 2015). The purpose of a newly started research project, called *Improving the Swimming Capability of Danish Children* is to strengthen the swimming capability of Danish children by developing, implementing and evaluating new and innovative types of school swimming. The main project aims are to 1) increase the number of children that can swim, and 2) promote that all municipalities in Denmark deliver high-quality swimming education for children and youth.

Methods:

Action research methods will serve as the basic starting point, and a mixed method approach is applied. A systematic triangulation of quantitative and qualitative data collection (observation, document analysis, surveys, interviews etc.) enables the research team to deliver a comprehensive evaluation related to the main project aims.

Results:

Through a three-year study (2015-17) the research will focus on 1) *reviewing* the current swimming education in Denmark, 2) *contributing* with supplementing insight in order to *develop* and *innovate* Danish swimming education, and 3) *generating* new knowledge of effective and (economic) sustainable swimming models that, ideally, teaches *all* children how to swim. The project already benefits from a pre-study finished in March 2015 (Dalsgaard et al., 2015).

A key focus point is to develop evidence-informed recommendations on how to improve school swimming.

Conclusion:

It is essential that all Danish children learn to swim. Not being able to swim can affect your life in different ways (drowning, social limitations etc.). During the next three years different types of innovative swimming models will be tested (e.g. teaching in open water). The pre-study shows (Dalsgaard et al, 2015) that traditional Danish swimming education *primarily* is school-based teaching, usually offered in the 4th grade (age 10), and carried out by a qualified instructor in a public swimming pool. However, this model is no longer economic sustainable (2015). Thus, we seek to find more sustainable and effective models that not only will teach children how to swim, but also benefit their over-all physical education and well-being.

PO.36

Theory-based identification of gestational weight gain determinants in Canadian low-income mothers: development of a qualitative study

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SIG: Yes, Socioeconomic inequalities

Awards:

Low-income pregnant women have received little attention in intervention studies aiming at controlling weight gain during pregnancy; even if they are at increased risk of pre-pregnancy obesity and excessive gestational weight gain (GWG). Maternal, psychological, demographic, familial, cognitive factors and body image during pregnancy as well as self-efficacy and motivation on adopting healthy eating behaviour and physical activity to gain appropriate GWG have been poorly studied in low-income Canadian women before designing intervention studies.

Purpose: To better understand determinants leading to excessive GWG in low-income Canadian women.

Methods: In partnership with 2 Health and Social Services Centres (CSSSs) in disadvantaged neighbourhoods in Montreal, Canada, we will recruit 60 adult pregnant women born in Canada participating in the OLO program (nutritional aid for pregnant women below the low-income Canadian cut-off and experiencing food insecurity). Beforehand, we will 1) perform an exhaustive literature review based on a conceptual model proposed by Hill et al. 2) conduct semi-structured interviews with public health delegates and 3) conduct focus groups with health professionals from the OLO program directly involved with pregnant women. These steps will allow us to better understand the needs and preoccupations of concerned actors and to better design focus groups with pregnant women. Then, 3 focus groups of 10 pregnant women in each CSSSs will be conducted. Each group will be questioned at two time points: just after the admission in the OLO program (between 20-25 weeks) and near of the end of the pregnancy (32-37 weeks). Semi-structured interviews and focus groups will be led by a qualitative research expert assisted by an observer. Data analysis will start with a verbatim transcription that will be further analysed using the software NVivo.10 to provide a precise content analysis.

Results/findings: We are planning to start our research in September 2015. Our findings will allow us to better understand multifactorial causes of excessive GWG in low-income Canadian women.

Conclusions: These results will be useful to design future effective interventions in Canadian low-income pregnant women and to improve social programmes already in place that are not specifically focusing on excessive GWG in this vulnerable population.

PO.37

LIFESTYLE FACTORS AND CANCER: INVESTIGATING THE CURRENT KNOWLEDGE OF UK MEDICAL STUDENTS.

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose

With at least one third of cancers being preventable, modifying patients' lifestyle factors should be an essential role for medical professionals, although many feel unprepared to do so. This survey investigated the knowledge of future doctors on the important link between lifestyle factors and cancer.

Methods

A Google Survey was sent to students at seven UK medical schools using social media websites. Students provided their year of study, age and university; and answered nine questions (MCQs to short answer questions) on knowledge and experiences within clinical practice of lifestyle factors and cancer.

Results

218 students (mean 21 years; range 18-32) completed the survey during the 14-day timeframe. Almost all responders (>98%) recognised diet, alcohol, smoking and exercise were lifestyle factors however only 69% recorded that weight was a lifestyle factor. When asked about which cancers were affected by lifestyle factors: lung (96% of responders), liver (95%) and colorectal (85%) were the commonest; only 66% reported breast.

Students were asked to describe which lifestyle factor impacted on which cancer with the majority reporting smoking/lung cancer, and alcohol/liver cancer; <5% reported physical activity or weight as being linked to any cancer. 96% of responders thought lifestyle factors were important in causing cancer, 85% in treating cancer and 83% post treatment.

77% of students had teaching at University on lifestyle factors and cancer with only 34% reporting this as good/very good. Students witnessed lifestyle advice to cancer patients mainly by GPs (60%) or consultants (39%).

Conclusions

Medical students across the UK report understanding of widely known relationships of lifestyle factors in certain cancers, although not an understanding that all lifestyle factors – including weight and physical activity – affect almost all cancers. Universities are in a unique position to improve knowledge that could lead to improved cancer prevention.

PO.38

From Inactive to Regular Jogger - a Qualitative Study of Behavioural Change among Recreational Joggers

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Despite extensive knowledge of barriers to physical activity, most interventions promoting physical activity have proven limited in terms of maintaining a behaviour change. The purpose of the present study was to investigate individual, cognitive, social, and contextual factors influencing adoption and long-term maintenance of regular self-organized jogging among former inactive adults.

Methods:

A qualitative study was conducted using semi-structured interviews. Ten informants were purposely selected from participants in the DANO-RUN research project (7 men, 3 women, aged 33-51). Interviews were performed on the basis of Theory of Planned Behaviour (TPB) and The Transtheoretical Model (TTM). Coding and analysis of interviews were performed using NVivo 10 software.

Results:

TPB: During the process of behavioural change, the intention to do jogging shifted from a focus on weight loss and improved fitness to physical health, psychological health, and well-being. An experience-driven change in affective beliefs contributed to the shift in the intention. Informants' initial expectations to own jogging abilities were realistic and modest, which in combination with a GPS-training watch applied sufficient perceived behavioural control to translate intention into regular behaviour.

TTM: Informants expressed rapid progression from the *pre-contemplation* to the *action stage* caused by an early shift in the *decisional balance* towards a majority of advantages. This was followed by a continuous improvement in *self-efficacy*, which facilitated the adherence to jogging behaviour. *Cognitive processes* of change were primarily used in the action stages, whereas *behavioural processes* dominated in the maintenance stage.

Conclusion:

In reference to the study purpose, individual factors relating to the development of a positive self-image as a recreational jogger improved jogging-related self-efficacy. Deployment of realistic goal setting was important in the achievement of regular jogging behaviour. Cognitive factors included a positive change in both affective and instrumental beliefs about jogging. Expectations from society and social relations had limited effect on intention. Social support was ascribed great importance for maintaining behaviour – especially in situations where the individual was prone to relapse. In the context of DANO-RUN, a sense of obligation to the project was emphasized in terms of motivation to initiate and maintain jogging behaviour.

PO.40

An Open-Access Digital Repository of Psychosocial Measures for Physical Activity, Eating Behavior and Weight Management

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Individual-level factors (such as motivation, self-regulation) are well-known predictors of health behavior in the areas of physical activity, eating behavior, and weight management. Two important implications are that i) adequate measurement of these constructs, using valid, reliable and culturally-appropriate instruments is a necessary condition for solid progress in research to take place, and ii) researchers must have easy access to these instruments to ensure high standards in assessment procedures. To address this need, we built an open-access digital Repository of Portuguese measures of self-regulation for physical activity, eating behavior, and weight management.

Methods: The project's implementation consisted of: selection of instruments, taxonomic categorization of available instruments, validity and reliability testing, and development of the digital Repository. Eligible instruments were identified through several sources (such as international repositories, key scientific journals in the field, and other research teams). Instruments were categorized according to the construct(s) and behaviour(s) assessed. For each instrument, we extracted information on the construct(s) assessed, mode of administration, scale scoring and interpretation, validation procedures, and psychometric properties.

Results: The Digital Repository includes Portuguese and original versions of each instrument, their validation status, psychometric properties, scoring procedures, and key bibliography, categorized in: 1) instruments targeting *Physical activity*, 2) *Eating behavior*, 3) *Weight management*, and 4) *general Motivation and Self-regulation* measures. All measures are self-reported. So far, forty questionnaires were identified, 15 of which were validated to the Portuguese population. Detailed descriptions and Portuguese versions of the measures were made available in the digital Repository. The Repository is regularly updated with new instruments and additional data to the existing ones. It also contains a glossary of psychometric and theoretical construct(s) terms.

Conclusions: This open access digital Repository is a valuable resource to enhance the quality of health behavior change research, by providing free access and support to the use of valid and culturally appropriate instruments for assessing psychosocial factors related to physical activity, eating, and weight management.

PO.41

Fast food intake and perceived and objective measures of local fast food environment in adolescents

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SIG: Yes, Policies and environments

Awards:

Purpose:

To examine associations between fast food intake and perceived and objective fast food outlet exposure.

Methods:

Information from 4642 adolescents (11, 13, and 15-yr) of the Danish contribution to the Health Behaviors in School-aged Children Study was linked to fast food outlets in 75 school neighborhoods. We used multivariate multilevel logistic regression analyses to examine associations between weekly fast food intake and perceived and objective fast food outlet measures.

Results:

Boys reporting two or more fast food outlets had 34% higher odds of consuming weekly fast food. We detected higher odds of weekly fast food intake among 15-yr old ninth graders ($OR_{all} = 1.74$, CI: 1.40-2.18; $OR_{boys} = 2.20$, 1.66-2.91; $OR_{girls} = 1.41$, 1.03-1.92) Danish speakers ($OR_{all} = 2.32$, 1.68-3.19; $OR_{boys} = 2.58$, 1.69-3.93; $OR_{girls} = 2.37$, 1.46-3.84) and those travelling 15 minutes or less to school ($OR_{all} = 1.21$, 1.00-1.46, $OR_{girls} = 1.44$, 1.08-1.93) compared to 11-yr old five graders, non-Danish speakers, and those with longer travel times. Boys from middle ($OR_{boys} = 1.28$, 1.00-1.65) and girls from low income families ($OR = 1.44$, 1.05-2.04) had higher odds of weekly fast food intake compared to those from high income backgrounds.

Girls attending schools with canteens ($OR = 1.47$, 1.00-2.15) had higher odds of weekly fast food intake compared to girls at schools without canteens.

Conclusions:

This study demonstrates perceived food outlets may impact fast food intake in boys while proximity impacts intake in girls. Public health planning could target food environments that emphasize a better understanding of how adolescents use local resources.

PO.42

The effect of 12 weeks exercise training on the psychological well-being of obese adults 12 to 24 months post-bariatric surgery

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SIG: No, this does not fit in any of the special interest groups

Awards:

Weight regain after bariatric surgery is increasingly observed 12 to 24 months post-surgery, and has been attributed largely to physical inactivity and psychological factors. Introducing an exercise intervention 12 to 24 months post-surgery could prevent weight regain and improve psychological well-being.

Objective: This randomised controlled trial examined the effect of a 12-week exercise intervention on body mass, anxiety, depression and self-efficacy for physical activity, among obese adults 12 to 24 months post-bariatric surgery.

Methods: 19 male and female patients aged ≥ 18 years, and between 12 and 24 months post-bariatric surgery, were randomly allocated to either an exercise training (ET) ($n = 9$) or a control (CON) ($n = 9$) group for 12 weeks. The ET group undertook three structured and supervised 60-minute moderate-intensity gym-based exercise sessions per week. Pre- and post-intervention body weight, and self-reported anxiety, depression and self-efficacy were assessed.

Results: This study saw a significant difference in body weight between groups at follow up ($F_{(1,17)} = 8.625$, $p > 0.01$, $\eta_p^2 = 0.47$, a large effect). The ET group displayed a mean reduction of 2.8kg whilst CON displayed an increase of 0.9kg. Self-efficacy at baseline ($M_{ET} = 845.0 \pm 126.3$, $M_{CON} = 693.9 \pm 133.1$) and after 12 weeks of exercise ($M_{ET} = 1264.5 \pm 145.5$, $M_{CON} = 653.3 \pm 153.4$) displayed a significant improvement in the ET group when compared to the CON group ($F_{(1,17)} = 15.263$, $p > 0.01$, $\eta_p^2 = 0.47$, a large effect). No significant changes in anxiety and depression were noted at the 12 week follow up.

Conclusion: A supervised and structured 12-week exercise programme significantly reduced body mass and increased self-efficacy in individuals 12-24 months post-bariatric surgery. Implementing an exercise intervention at the point of weight regain could improve long-term bariatric surgery weight and self-efficacy outcomes.

PO.43

A Comprehensive Content Analysis of Games for Health

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SIG: Yes, e- & mHealth

Awards:

Purpose:

As "games for health" research continues to gain momentum, the games deserve a closer examination. No studies have explored the attributes and usability features of health games as a whole. Most academic publications have been systematic reviews or meta-analyses of one or a few health games (e.g., design, intervention). We report here the preliminary findings of a first-of-a-kind content analysis of a large selection of health games.

Methods:

We examined all international health game databases ($N=7$) identified by multiple academic game research organizations. The databases included: Health Games Research by Robert Wood Johnson Foundation (All games); Serious Game Classification (All games); Games for Change-Health; Playful Learning-Health; Science Game Center; Serious Games Directory-Health Care/Medical; and, Games & Simulation for Healthcare. All games published online by January 1, 2015 were included; after that data on individual games were abstracted, duplicates were removed. Additional games were identified from larger game portals. A content analysis coding scheme was developed for games' attributes and usability levels and applied to each game. Eleven coders played each game to code their content in detail after going through extensive training sessions to achieve substantial-to-almost perfect agreement (Kappas: 0.61-1).

Results/Findings:

A total of 1,760 individual health games produced between 1983 and 2014 in 20+ countries were identified from the seven databases, which had few overlaps in coverage. The team played all available games: 1,261 of 1,760 games (72%). Of the 1,261, 94% were solo-player games. Simulation was the most popular genre (8%). 72% were free games. 43% had one playable character and 16% had more than one. Of the games with characters, the most popular character types were Caucasian humans (30%) and animals (23%). Aside from the 49% of characters of no identifiable gender, more male (32%) were observed than female characters (19%). The main usability issues included: lack of customization, a lack of ability to skip contents, and lack of feedback and instruction.

Conclusions:

There is a growing international trend of health game production. Diversified content, characters, and design principles should be considered by developers to align the exponential growth of this industry with its global audience.

PO.44

Sedentary Behaviours and Anthropometric Measures of a Multidisciplinary School-Based Intervention in Children (Project PANK). A Randomized Controlled Trial.

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SIG: Yes, Policies and environments

Awards:

Objective:

Large proportions of children across Europe spend a lot of time in sedentary behaviours (SB). Accumulating evidence suggests that SB are associated with overweight and obesity. The present study is a part of Project PANK, a six months multidisciplinary school-based intervention aimed to improve variables associated with cardiovascular and metabolic risk factors. This study reports the anthropometric measures (AM) and SB data from Project PANK.

Methods:

Overweight and obese children, from southern Portugal (N=77, 7-10y, both genders) were recruited. Intervention group (IG=40) had a physical activity (PA) intervention with 3 individual meetings for children and parents, an additional weekly physical education class (1 hour) and 6 educational sessions about PA and SB. At the same time, IG had a nutrition intervention with 3 individual meetings for children and parents and 6 educational sessions. Control group (CG) had no intervention. In IG, AM was assessed at baseline and end of the program using standardized procedures and SB was assessed at baseline, after 3 months and program end by accelerometers GT3X during 7 days. In CG, SB and AM were assessed at baseline and end of the program.

Results:

The IG showed a significant decrease in BMI Z-score ($p<.001$), in waist circumference ($p=.013$) and in waist-to-height ratio ($p<.001$), when compared with CG. No differences were found between groups in several bouts of SB (1-4, 5-9, 10-14, 15-29 and more than 30 minutes). IG showed a higher number of breaks of SB to do vigorous PA ($p=.043$). No differences were found between groups in total time in SB considering week and weekend days. Changes in AM were not associated with SB changes of the IG participants during the program.

Conclusions:

The positive results in AM show the effectiveness of PANK, confirming the current evidence about multidisciplinary school-based interventions, trained experts and a parental component. Considering the results verified in SB, possible changes in behaviour related to the PA (not studied) can explain positive results verified in AM. To reduce the SB in these ages seems necessary a more specific intervention and the implementation of other components in the programs.

PO.45

Step-defined Physical Activity Hierarchies and Cardiovascular Risk Factors In Cardiac Rehabilitation.

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Pedometer can be used to applied behavior change techniques such as "self-monitoring of behavior", "goal setting behavior" and "instruction on how to perform the behavior" to improve physical activity in cardiac rehabilitation. However, it's not clear how many steps improve cardiovascular risk factors in cardiac rehabilitation and secondary prevention. The aim of this study is to describe and compare cardiovascular risk factors between different levels of activity based on step-defined physical activity hierarchies among persons with ischemic heart disease.

Methods: Descriptive-comparative study was performed. Ninety adults with ischemic heart disease were included. Piezoelectric pedometer with 7-day memory (NL-1000) was worn at the hip for 7 consecutive days from morning to bedtime. Based on literature, participants were classified in sedentary group (group1) (average < 5000 steps/day), in low to somewhat active group (group2) (average 5000 to 9999 steps/day) or in active group (group3) (average > 10000 steps/day). Accordingly, twenty-two participants were classified in group 1, 43 in group 2 and 25 in group 3. Cardiovascular risk factors were clinically measured following standard methods. ANOVA was used to compare cardiovascular risk factors between the 3 groups.

Results/findings: All groups were equivalent for socio demographic and clinical characteristics. Pharmacotherapy was also equivalent between groups except for fibrate (24% in group1, 3% in group2 and 0% in group3). Differences were observed between group1 and group2 for triglycerides (1.5 ± 0.5 vs 1.2 ± 0.6 mmol/L; $p=0.04$), non-HDL cholesterol (2.8 ± 0.9 vs 2.4 ± 0.7 mmol/L; $p=0.032$) and apoB (0.8 ± 0.2 versus 0.6 ± 0.2 mg/L; $p=0.01$). Differences were also observed between group1 and group3 for waist circumference (105 ± 12 vs 91 ± 10 cm, $p=0.001$), body mass index (31 ± 6 versus 26 ± 3 kg/m², $p=0.05$), triglycerides (1.5 ± 0.5 vs 1.1 ± 0.4 mmol/L, $p=0.016$) and non-HDL cholesterol (2.8 ± 0.9 vs 2.4 ± 0.6 mmol/L, $p=0.05$). No different were observed for other cardiovascular risk factors.

Conclusion: Cardiovascular risk factors associated with energy metabolism were different between levels of physical activity based on the number of daily steps among persons with ischemic heart disease. Our results support the use of pedometer for management of cardiovascular risk factors in cardiac rehabilitation and secondary prevention program.

PO.46

Physical activity, sedentary time, psychological need satisfaction and physical function in older adults residing in assisted living accommodation

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Physical activity (PA) generally decreases with age (whilst sedentary behaviour increases) and this often leads to functional impairment. Examining the motivational factors that support PA engagement is therefore important. Self-Determination Theory (SDT; Deci & Ryan, 2000) is a motivational framework that considers the important role of basic psychological needs (autonomy, competence, relatedness) in the facilitation of optimal motivation and health. The purpose of this study was to examine how physical activity and sedentary time mediated the relation between psychological need satisfaction and physical function in older adults residing in assisted living accommodation.

Methods:

Participants were 96 older adults (mean age 78 years (SD= 7.87); female 63) recruited from 15 assisted living facilities across the UK. A cross-sectional design was employed. Psychological need satisfaction via PA participation was assessed using a validated questionnaire, while physical activity and sedentary time were assessed over a 7-day period using accelerometry (GT3X+, wGT3X-BT). Physical function (spirometry, grip strength, gait speed with use of assistive device) was assessed using a hand-held spirometer, a digital dynamometer, and Timed Up and Go test (TUG). A multiple mediation analysis was conducted using the PROCESS macro by Hayes (2013).

Results/findings:

Competence was an indirect predictor of use of assistive device for walking through Sedentary time (ST), $b = -0.14$, 95% CI = [-0.35, -0.04]. Competence was also an indirect predictor of Forced expiratory ratio (FER), $b = 0.15$, 95% CI = [0.01, 0.51], and Timed Up and Go (TUG), $b = -0.15$, 95% CI = [-0.34, -0.04], via light physical activity. There was an indirect effect of competence on Forced expiratory ratio (FER) through Moderate to vigorous physical activity (MVPA), $b = 0.14$, 95% CI [0.01, 0.31]. No mediation effects were found with respect to autonomy and relatedness needs.

Conclusions:

The results revealed that competence may play a role in predicting PA and ST in elderly people living in assisted living accommodation, which in turn is associated with better respiratory and functional health. This suggests that in order to encourage PA participation and therefore functional health in this population, future interventions could focus on enhancing perceptions of competence related to physical activity.

PO.47

The Dark Side of Motivation: mediators of controlling motivational strategies used by exercise professionals

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Pressures felt at work by health and fitness professionals may play a detrimental role in the motivational strategies they used with their clients. According to Self-Determination Theory (SDT) perceived pressures can diminish the use of autonomy supportive practices and lead to controlling ones, with detrimental effects on the quality of exercise experience and continued exercise adherence. This study sought to analyze the indirect effects of controlled regulations for work (both introjected and external) and amotivation, in the relationship between perceived job pressures (PJP) and controlling motivational strategies (CONTS) reported by exercise professionals.

Methods:

PoEMA is an observational, cross-sectional study. 365 health and fitness professionals (172 women) completed questionnaires covering PJP, a global score based on pressures at 3 levels: above (organizational constraints); within (trait of autonomous functioning-reversed); and below (perceptions of client's controlled motivation). CONTS were assessed via a total score (TotCONTS), excessive use of rewards (EUR), negative conditional regard (NCR), intimidation (INT), excessive personal control (EPC), and judging and devaluing (JAD). Controlled regulations for work (introjected and external) and amotivation were also assessed. Bivariate and partial correlations were used to examine the associations between all variables in the study. Preacher and Hayes procedures examined the effects of PJP on CONTS (both total and each separate strategy), via amotivation and controlled work regulations. Models were adjusted for gender and work experience (years).

Results: PJP predicted all types of CONTS (ranging between 18.49% and 8.69%). The effects of PJP on CONTS were partially explained by significant indirect effects through introjected regulation (partial mediation, 95% CI of TotCONTS .01 to .11; INT .01 to .03; EPC .01 to .04; and EUR .01 to .03). No other indirect effects were found.

Conclusions:

PJP are associated with the use of CONTS, as expected. Importantly, this deleterious association seems to be explained by the role of introjected regulations towards work. Pressuring work contexts can enhance the development of internal pressures and contingency ego-involvement of the professionals in their work affecting the motivational strategies they use. Creating positive (autonomous) exercise motivational contexts, may begin with reflecting upon gym policies and practices toward their exercise professionals.

PO.48

Association of functional incapacity with the level of physical activity combined with sedentary behavior in elderly

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²Federal Institute of Sergipe, Aracaju, SE, Brazil

SIG: Yes, Socioeconomic inequalities

Awards:

Objective: To analyse the association of functional incapacity with physical activity level combined with sedentary behaviour in elderly from three regions of Brazil.

Methods: Cross-sectional study, considering a sample of 909 elderly. In identifying of the association of functional incapacity with the physical activity level combined with sedentary behaviour was used a combination of cutoffs of 150 minutes per week of physical activity and 240 minutes per day of sitting time. For this analysis was performed crude and multivariate Poisson Regression, with calculation of adjusted prevalence ratios, $p < 0.05$.

Results: The prevalence of functional incapacity was 52.1%. Multivariate analysis revealed association of functional incapacity with the level of physical activity combined with sedentary behaviour, both in crude analysis $PR = 2.17$ (CI95% 1.42-3.12) as adjusted by the sociodemographic factors and health $RP = 2.04$ (CI95% 1.13-4.02).

Conclusions: The condition of functional incapacity was detected in more than half of the elderly, preventive actions that promote the reduction of sedentary behaviours and encouraging the practice of physical activities should be tied to public policies to promote the autonomy of elderly.

PO.49

Are adolescents in Olomouc more active at home or at school environment?

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Faculty of Physical Culture, Palacky University, Olomouc, Czech Republic

SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Increasing prevalence of obesity and other non-communicable diseases became common in current society. The level of physical activity (PA) serve as one of the preventive factors in unhealthy lifestyle habits within public health especially in adolescents. Built environment was recognize as a strong determinant on the level of PA. Localization of PA within the activity space may differentiate the level and structure of PA. Therefore the aim of presented study is to locate the structure of adolescent PA within their home and school environments.

Methods:

Week-long monitoring of PA using GPS logger Holux and accelerometers ActiGraph was realized during the spring of 2014. Sample of 31 adolescents - 16 boys (13.5 ± 0.8 years; 168.3 ± 10.4 cm; 58.4 ± 12.5 kg; $BMI 20.6 \pm 3.2$ kg·m⁻²) and 15 girls (13.5 ± 0.8 years; 161.9 ± 7.2 cm; 51.0 ± 9.7 kg; $BMI 19.4 \pm 3.1$ kg·m⁻²) from 3 schools in Olomouc in Czech Republic we enroll in this study. Data with at least 8 hours in four or more days of monitoring were included into analyzes. Data were processed using Personal Activity and Location Measurement System (PALMS) and Geographic Information Systems (GIS).

Results:

Participants spent 43.1 % of time within home neighborhood (buffer = 250 m). Structure of participants PA within home environment was characterized as stationary (52.8 %), light (36.9 %), moderate (9.7 %), and vigorous (0.5 %). Structure of their PA within school environment was differentiated as stationary (54.0 %), light (37.2 %), moderate (8.4 %), vigorous (0.4 %).

Conclusions:

Results of similar studies may influence policy in practice of urban planning and building healthier communities. Localization of activity spaces seems to be an important factor when creating or building new communities.

PO.50

Maintenance of adults and elderly in a walking program in a socioeconomically disadvantaged community

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: The objective of this study was to analyze the maintenance reasons in a walking program among adults and older adults in a low-income community. Becoming long-term physically active is one of the big challenges in public health since most people start a physical activity (PA) practice, however different bio-psychosocial factors can interfere in the continuity, especially in low income communities.

Methods: The "Guided Walking Program" was a six months community-based intervention that offered 50-minutes of walking four times a week and educational workshops for behavioral change once a month to adults and older adults living in a socioeconomically disadvantaged community in the city of Sao Carlos, São Paulo state, Brazil. It was developed by a research team from the Federal University of Sao Carlos in partnership with three Primary Health Care Centers in the neighbors. 106 individuals participated at least once in the classes. 64 of them concluded the evaluations. A survival analysis by Kaplan Meier estimator was carried out using time (number of classes during six months), status (dropouts). We consider the following factors: sex (men; women), Body Mass Index (≤ 25 ; >25), age group (≤ 50 years; >50 years), presence of non communicable diseases (none; ≥ 1), scholarship (≤ 4 years; >4 years); salary (≤ 1 ; >1); health perception (good; bad); Being employed (yes; no).

Results/findings: They participated in an average of 37% of the classes a week, not achieving the recommendations of 150 minutes of PA a week. They were classified in active (32, 8%), insufficient active (46,8%) and dropout (20,3%). The active individuals were excluded of the analysis (n=21). The Logrank Test showed that to be older (p= 0.000) and female (p= 0.033) were factor that contribute of maintaining in the intervention. The other factors did not interfere significantly in the adherence of the group.

Conclusions: Older adults and women participated longer in PA interventions in low income communities. Knowing the reasons to maintenance are very important since can be used to plan strategies of regular participation in the PA programs carried out in disadvantaged communities.

PO.51

Engaging Children in Physical Activity

Kiara Lewis
University of Huddersfield, Huddersfield, UK

SIG: Yes, Motivational Dynamics

Awards:

Purpose: To explore the physical activity experience from the child's perspective to inform future interventions. The research has engaged with active boys and girls, many of whom have been previously disengaged with activity, some of whom were obese, to understand why they are now active.

Methods: The results of three studies, one mixed methods, one literature review and one qualitative, have been synthesised to provide a commentary on why children engage with physical activity. The studies have all been published in peer review journals (by the author), the combined synthesis of results draws together the results of the qualitative aspects of the studies. The data was analysed with a subtle realism lens. This type of design and philosophical approach is seen as useful for giving a voice to underserved populations.

Results: For some children being forced to be active is counterproductive as they associate activity as something that has to be 'got out of the way' or avoided where possible. The results of this thesis provide support for the 'Self Determination Theory' and suggest children and young people like to be active if they feel competent and supported by parents and peers and respected by teachers/instructors. In addition they like to feel in control of their bodies whilst being active and to choose which activities to take part in. Many children, in particular obese children, lack confidence in both their physical and social skills to interact with their peers in a physical activity setting. In providing separate activity sessions, which promote a caring and supportive climate, children can develop competencies which enable them to enjoy being physically active. These findings need to be understood and further developed if we are to engage all children into physical activity.

Conclusions: Children's physical activity levels are of continuing concern as the health implications for both childhood and later on in adulthood, may be determined by their experiences of physical activity whilst growing up. Although many attempts have been made to increase physical activity levels relatively little attention has been paid to listening to the voices of children and how they experience physical activity.

P0.53

Developing effective Community-based Physical Activity Interventions for Older Adults Living in Rural and Regional Areas

Melissa Moore

La Trobe University, Wodonga, Victoria, Australia

SIG: No, this does not fit in any of the special interest groups

Awards:

Objective:

Despite well-known health benefits of regular and adequate physical activity (PA), 31% of adults (aged ≥ 15 yrs) world-wide engage in insufficient PA(1). Specifically, levels of PA tend to decline with age(2), and physical inactivity in older adults is accentuated in rural/regional areas due to a lack of appropriate services and activities(3,4). This is an increasing concern given population ageing in rural /regional areas, where patterns of migration show both out-migration of younger people to metropolitan areas, and in-migration of retirees to rural/regional areas(5,6). Community-based interventions have the potential to promote PA participation across the lifespan(7,8), yet no systematic review has evaluated the effectiveness of community-based interventions for increasing PA participation in older adults living in rural/regional areas. Thus, the purpose of this systematic review is to assess the characteristics and effectiveness of community-based interventions designed to increase PA participation in older adults living in rural or regional areas.

Methods:

Relevant peer-reviewed literature (from inception to August 2014) was obtained using four electronic search engines, in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analysis Statement. Article inclusion criteria included the following: participants aged 65yrs or more with or without diagnosed illness; living in rural or regional areas; community-based PA intervention ≥ 6 week's duration; and peer-reviewed published in English. The initial search identified 4,960 articles. After removal of duplicates, titles and abstracts were independently screened in a two-step process of exclusion by two reviewers. Seven articles were included in the review.

Results:

There are few consistencies in the literature between intervention types, duration, outcome measures, and follow-up. Results provide some evidence to support the effectiveness of community-based interventions that are tailored; theoretical-based; and include low-to moderate-intensity exercise (e.g. walking, tai-chi, aquatic, strength-based) to increase PA, physical function, and psychological state. However, without more rigorous studies it is difficult to identify the most critical characteristics of community-based interventions for older adults in rural/regional settings.

Conclusions:

Building on existing evidence and results from this review, a physical activity consultation(9) might be effective in promoting PA in this target population. This remains a plausible and promising focus for future research.

P0.54

Gender differences in sports involvement: a case of children's self-stereotyped ideas

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SIG: Yes, Early care and education

Awards:

Despite the increase in female sport participation over the last decades, boys and girls still do not participate equally in the same sport activities. Our main purpose was to understand if this was because self-stereotyped ideas. Self-reported answers were obtained during small interviews in three schools at Coimbra, Portugal (N=443, 47.9% boys, mean age of 7.661). A questionnaire was delivered to parents who were asked about some socio-demographic data. Four questions/affirmations deserved our careful consideration: "To do sport is more important for boys than girls" (1), "Boys are better sportsman than girls" (2), "There are sports exclusively for boys" (3), and "There are sports exclusively for girls" (4). We found that age is a strong factor when it comes to self-stereotyped ideas about sport participation. Older kids tend to be more open to the idea of girls having the same rights to participate in sports ($p=0,004$, $p=0,017$, $p=0,001$, and $p=0,002$ respectively). Girls show more attention to the equality of rights assuming that boys and girls have the same skills ($p=0,001$) and that sport is essential for both sexes ($p=0,001$). The majority of kids assumed that there is not any sport exclusively for one of the sexes. However, we found a statistical difference on "There are sports exclusively for boys" ($p=0,002$): 16,59% of the boys believes that some sports are restricted to their own gender. Parents' scholar degree did not influence kids answer. We also found differences on question 1 ($p=0,017$) and 3 ($p=0,005$) and a tendency for 2 ($p=0,058$) and 4 ($p=0,090$) according to the school each children was attending. These stereotypes, whether made consciously or unconsciously, are present in children since a young age. Our findings are disturbing since habits and routines maintained in adulthood are usually adopted around this age. The gender differences can be due to socialization process since we also found differences according to each child's school. Interventions are needed not only in order to raise females' confidence in their ability to sports but more important to change male perception of sexes, particularly girls value, in sport activities.

PO.55

Do woodland improvement interventions increase physical activity in urban deprived areas?

Jennifer Thomson, Jamie Pearce, Niamh Shortt, Catharine Ward Thompson
University of Edinburgh, Edinburgh, UK

SIG: Yes, Policies and environments

Awards:

Objective:

Local woodland enhancements have been identified as an opportunity to improve a variety of well-being related outcomes including physical activity. However we still do not know which types of woodland are more likely to encourage healthy behaviour and which social groups are more likely to benefit from interventions. This study examined whether the behaviour of people living in urban deprived neighbourhoods had changed since woodland interventions had taken place.

Methods:

A quantitative, case-comparison methodology was adopted. Questionnaires were carried out on woodland users recruited across four urban woodlands including two intervention sites and two non-intervention sites. One hundred and ninety eight participants were interviewed and asked about their use and perceptions of woodland. Demographic and socio-economic indicators such as age, gender and neighbourhood-level deprivation were also included in the analyses. Statistical techniques included the chi-square test, binary logistic regression and the Mann-Whitney-U test.

Results:

Findings revealed that at the intervention sites 61% of woodland users had changed their use of the outdoors. Fifty six per cent of those respondents visited the site more often, 42% were more physically active and 34% spent more time outdoors with friends and family. Those with a university or professional qualification had reduced odds of changing behaviour. Significantly more respondents reported that they felt safe, found the woodland easy to get around in and well maintained at the intervention sites than at the non-intervention sites. Differences in behaviour according to age and gender were also identified. Area-level deprivation was associated with using the woodland several times a week or more, with more visitors coming from affluent neighbourhoods than the most deprived areas.

Conclusions:

The findings emphasised the importance of recreational woodlands in urban areas for enhancing health and well-being of local residents. The study has shown that woodlands which are better cared for encourage more outdoor physical activity than those that are not managed. However the results also suggest that the recreational use of urban woodlands is not equal across social groups.

PO.56

SOCIAL AND CULTURAL FACTORS FOR ACTIVE LIVING IN SRI LANKA

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¹University of Colombo, Colombo, Sri Lanka, ²University of Peradeniya, Kandy, Sri Lanka

SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Physical inactivity is identified as the fourth leading risk factor for mortality due to NCDs. Physical activity (PA) can be achieved through 'active living' which is a way of life that integrates PA into daily routine. However being active is a culture that needs to be cultivated. Social environment is a poorly studied area in respect to PA. This study was carried out to assess the social environment and its associated factors that modulate PA in Sri Lanka.

Methods: A mixed method approach was used. In the quantitative approach a group of 1320 adults aged 20-59 assessed their social environment and PA. The perceived social environment was assessed in the areas of harmony, respect, trust, interactions, help from others, social disruption, acceptability of PA, and encouragement. PA was assessed using the international physical activity questionnaire. Six focus group discussions were carried out with 8-10 participants in each.

Results/findings: In the quantitative assessment social cohesion and social acceptance to PA did not show a statistically significant relationship with the total PA, but did so with leisure time PA. The qualitative assessment identified that unity, respect, social order, social networks, social support and having social groups in the community facilitated while social disruption, discrimination and presence of undesirable people and undesirable activities hindered participation in PA. Social norms, attitudes and beliefs were thought to affect PA. The main reasons identified for differences in the above social constructs were socio economic status, gender, ethnicity, and lack of policy on equality.

Conclusions: Social environment is an important factor in promoting PA in Sri Lanka and acknowledges that healthy behaviours operate in broader social, political and economic context. Therefore for a holistic intervention culture as seen through "norms, beliefs, attitudes should also be addressed through health education and through development of more favourable policies for equity for healthy behaviours in Sri Lanka.

PO.58

Healthy, wealthy and wise? Which mid-age women are highly active over a 12-year period?

Toby Pavey, Tracy Kolbe-Alexander, Wendy Brown
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The University of Queensland, Brisbane, Australia

SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Current Australian physical activity (PA) guidelines encourage adults to accumulate 150-300 minutes of moderate to vigorous PA each week. Some critics assert that 300 minutes is unachievable. The aim of this study was to identify the proportion of mid-aged women who met the 300-minute recommendation over a 12-year period, and to identify the socio-demographic, biological, lifestyle, and work-related determinants of high amounts of PA.

Methods: The study involved 11254 participants from the Australian Longitudinal Study on Women's Health, who completed triennial surveys from 2001 to 2013. Baseline age in 2001 was 50-55 years. Self-reported PA was assessed as time spent in walking, moderate and vigorous activity in the previous week; an index of MET.min/week was derived and dichotomised as <1000 MET.min/week (< 300 minutes; not highly active) or ≥1000 MET.min/week (≥300 minutes; highly active). Generalised Estimating Equations were used to examine univariable and multivariable associations of country of birth, area of residence, education, marital status, retirement, number of children living at home, caring for (grand) children, caring for others, body mass index, number of chronic conditions occupational status, working hours, smoking, alcohol intake, sitting-time and stress, with physical activity status.

Results: Across the 12-year period, the proportion of women who were highly active ranged from 32% in 2001 to 47% in 2013. Vigorous activity accounted for almost one quarter of the reported PA in the highly active women. All variables were significantly associated with physical activity in univariable models. In the multivariable model, the women most likely to be highly active were those who were highly educated, healthy weight, ex-smokers, low-risk drinkers, who worked part-time or were retired, sat for less than 8 hours per day, and did not provide daily care for children.

Conclusions: These results are the first to show that accruing 300 minutes or more of PA is achievable for a large proportion of mid-aged women. The study also confirms the socio-demographic, biological, lifestyle, and work-related determinants of high PA levels in mid-aged women.

PO.59

Compensation of school mental load through physical activity in adolescents on weekends

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SIG: Yes, Early care and education

Awards:

Objective: The mental load associated with sedentary behavior is one of the most serious problems in promoting health of the young people. We do not know what the weekends' PA of individuals with different mental load during school days is (innovative feature). The aim of the study is to examine how young people compensate the school mental load through physical activity on weekends.

Methods: The research was conducted at 16 secondary schools and included 149 girls (age 16.50 ± 1.10; weight 59.10 ± 9.94; height 166.82 ± 5.81; BMI 21.23 ± 3.32; HRrest 64.87 ± 6.66) and 78 boys (age 16.71 ± 1.18; weight 71.54 ± 11.84; height 179.06 ± 7.63, 22.33 ± 3.56 BMI; HRrest 60.44 ± 6.56). Participants completed IPAQ-long questionnaire before the PA monitoring. The PA monitoring consisted of: a) three day monitoring of PA using the ActiTrainer accelerometers - monitoring of the heart rate (HR), and b) monitoring of weekly PA using pedometers. The participants were divided into two groups with lower and higher mental loads in lessons. The group with higher mental load was consisted of participants who did not achieve the physical load <3METs, but they achieved ≥60% HRmax according to the HR monitoring.

Results: Boys and girls with higher mental load in lessons do not compensate this load through the volume of PA on weekends. The boys, who had smaller mental load at school, took on average 8989 steps/day (more mental load 8189 steps/day) on weekend. The girls, who had smaller mental load took even significantly more steps (10,877 steps/day) than girls with more mental load (8938 steps/day). We found no significant difference in the intensity of moderate to vigorous PA (expressed in <3METs load and ≥60% HRmax).

Conclusions: It was confirmed that weekends' physical activity does not adequately compensate the mental load of adolescents on school days, neither the volume nor the intensity indicators of PA. The knowledge about the compensation of the mental load carrying out PA should be also an essential part of physical literacy of students and teachers.

PO.60

VALIDITY OF THE PHYSICAL ACTIVITY BEHAVIOR QUESTIONNAIRE (QCAF) AMONG HEALTHY AND UNHEALTHY INDIVIDUALS

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¹Unicamp, Campinas, SP, Brazil, ²Université Laval, Québec, QC, Canada, ³University of Toronto, Toronto, ON, Canada, ⁴Concordia University, Montreal, QC, Canada

SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The aim of this study is to test the convergent and divergent validity of the Physical Activity Behavior Questionnaire (QCAF, acronym in Portuguese for Questionário do Comportamento de Atividade Física), an instrument developed based on the Theory of Planned Behavior.

Methods: This methodological study was conducted among 236 individuals referred for cardiopulmonary exercise testing with oxygen uptake. Coronary heart disease, hypertensive and healthy individuals were enrolled. PA was measured by the QCAF and the Baecke Habitual PA Questionnaire (Baecke-HPA). Cardiorespiratory fitness was estimated by the Veterans Specific Activity Questionnaire (VSAQ), peak (VO₂peak) and maximum oxygen uptake (VO₂max). Adjusted partial correlations controlling for sex, age, education, BMI and disease (CHD or Hypertension) were determined between the QCAF and the Baecke-HPA; and between the QCAF and the direct and indirect measures of cardiorespiratory fitness.

Results/findings: The convergent validity was verified by the existence of a relation between the QCAF and the measures of physical activity - Baecke-HPA (radj=0.32; p<0.0001) and cardiorespiratory fitness - VO₂peak (radj=0.15; p=0.02), VO₂max (radj=0.13; p=0.05) and VSAQ (radj=0.13; p=0.05). The divergent validity was confirmed by the absence of significant correlations between the QCAF and the Occupational Physical Activity domain of the Baecke-HPA (r=0.04; p=0.49), as expected.

Conclusions: The QCAF presented acceptable levels of convergent and divergent validity, pointing to be a useful tool in order to measure walking among a diverse adult population. It is expected that the results of this study contribute to providing robust measure for evaluating PA in clinical practice, for evaluation of health interventions aimed at promoting an active lifestyle, as well as for maintenance of PA among healthy individuals. Future studies should include objective measures of PA in addition to self-report.

PO.61

Physical activity is the only modifiable lifestyle factor that predicts post-operative outcomes in elective surgical patients.

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¹University of Glasgow, Glasgow, UK, ²Royal Alexandra Hospital, Paisley, UK

SIG: Yes, Cancer Prevention and Management

Awards:

Objectives:

Enhanced recovery after surgery (ERAS) programmes aim to standardise patient care before, during and after surgery to shorten their recovery and improve post-operative outcomes. Many patient-related lifestyle factors can potentially adversely influence these outcomes, but it remains unclear as to which lifestyle factors affect outcomes the most in the setting of a colorectal ERAS programme. This study explores the influence of such factors on short-term outcomes after elective colorectal surgery.

Methods:

Consecutive patients enrolled on an ERAS pathway after elective colorectal surgery at one hospital site from June 2013 to March 2014 were included. Data was collected prospectively from an ERAS database that recorded indicators of post-operative outcomes. These were linked to computerised hospital pre-assessment records that noted patient demographics, smoking status, alcohol intake, BMI, comorbidity and self-reported physical activity levels (graded as 0: unable to climb a flight of stairs, 1: must rest before reaching the top or 2: able to climb stairs without stopping). Pre-operative lifestyle factors were analysed for their influence on post-operative complications and length of stay.

Results:

A total of 138 patients were included: 55.1% male; mean age 61.4 years (s.d. 15.0). Forty-nine (35.5%) were non-smokers, 6 (4.4%) reported hazardous alcohol intake, 78 (56.5%) were overweight or obese, 10 (7.2%) had a limited physical activity capabilities and 66 (47.8%) had significant morbidity. Forty-six (33.3%) had a post-operative complication. The mean length of stay was 7.8 days (s.d. 4.9).

Patients with limited pre-operative physical activity levels were associated with more than a 5-fold increased risk of post-operative complications (OR 5.1 (95% c.i. 1.24, 21.03; P=0.024) and were almost 3 times more likely to have prolonged hospital stay (OR 2.87 (95% c.i. 1.02, 9.80; P=0.047) compared to those with unlimited physical activity levels. Age, gender, deprivation, smoking status, alcohol intake, BMI or levels of co-morbidity were found not to be significant.

Conclusion:

A lower physical activity level was associated with significantly increased post-operative complications and prolonged hospital stay. Future work should focus on the role of pre-habilitation in elective colorectal surgical patients.

PO.62

A methodology to leverage cross-sectional accelerometry to capture weather's influence on active living

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¹University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²Dalhousie University, Halifax, Nova Scotia, Canada

SIG: Yes, Policies and environments

Awards:

Objectives:

While active living interventions focus on modifying built and social environment, weather variation, a phenomenon that perennially interacts with these environmental factors, is consistently underexplored. The objective of this study is to develop a methodology to leverage existing cross-sectional accelerometry data in developing active living interventions that factor-in weather variation.

Methods:

As part of an active living initiative in Saskatoon, Canada (www.smartcitieshealthykids.com), urban design, and built and social environment were measured. Actical accelerometers were used to collect physical activity data in 25 sequential one week cycles between April and June, 2010. Each accelerometry cycle was conducted on different cohorts within the total sample of 455 children. Each accelerometry cycle was matched with localized weather categories (e.g. Warm-Wet-Calm) simulated by factoring-in the interrelationship between temperature, precipitation and wind. Multilevel modeling using Hierarchical Linear and Non-linear Modeling software was conducted to depict the influence of environmental exposures (including weather variation) on physical activity.

Results:

Utilizing the proposed methodology, weather variation's influence on physical activity was captured with cross-sectional accelerometry during a single seasonal transition (spring to summer). Overall, physical activity increased during warmer days and decreased during colder days, thus corroborating existing evidence that physical activity is positively associated with increasing temperature. However, after simulation of localized weather patterns by factoring-in the interrelationship between different weather variables, a more nuanced picture emerged. Wind was the detrimental factor which modified the influence of both temperature and precipitation on physical activity. Multilevel models, taking into account urban design, built and social environment at the neighbourhood level depicted that irrespective of weather patterns, children residing in denser neighbourhoods with high diversity of destinations were more likely to be active.

Conclusion:

As weather is non-modifiable, the focus falls on understanding how diverse environmental exposures interact with varying weather patterns to influence physical activity. The proposed methodology could be utilized to leverage globally available existing cross-sectional accelerometry data to develop place-specific active living interventions across the world.

PO.64

Do those from low socio-economic status neighborhoods benefit from walkable built environments?

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose/Objectives:

Understanding the linkages between the built environments, socio-economic status and healthy transport choices is essential if we wish to develop environmental based solutions of eliminating health disparities. Thus, researchers have examined whether the influence of the built environment on active transportation differs for groups of different socio-economic status and have obtained mixed results. These equivocal findings could be due to the way the built environment measures were determined, more specifically the neglect of environments lying exterior to the residential neighborhood. Exposures from within the entirety of an individual's spatial trajectory have the potential to motivate behavior. Thus, the practice of limiting our measurements of exposures to the residential neighborhood when examining environment-individual interactions will result in the neglect of many exposures that could act as key drivers of behavioral choice. This study seeks to examine socio-economic status as a moderator of the relationship between the built environment and active transportation using measures of built environment exposure for the entirety of the spatial trajectory of transport trips.

Methods:

The 2008 Montreal Origin-Destination (OD) survey provided origin destination coordinates for a sample of 156 700 participants. We selected participants from this survey that had travelled within the census metropolitan area of Montreal, that were mobile the day preceding the interview, and that were between 18-65 years of age. An index of material disadvantage calculated using a 400-meter buffer centered on the place of residence of each participant was used as an indicator of neighborhood socio-economic status. A 400-meter buffer around the trajectories of each participant's trips was used to measure the participant's exposures to connectivity, land-use mix and access to destinations.

Results:

We found significant interactions between socioeconomic status and all three environmental variables connectivity, land-use mix and access to destinations.

Conclusions:

Our findings suggest that even when the right environmental conditions are present there may be social or physical barriers that prevent those from low socio-economic status neighborhoods from benefitting from built environments that are conducive to active transportation.

PO.65

Determinants of physical activity: a qualitative study from low SES neighbourhoods in the Black Country, UK.

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Regular physical activity is important for prevention of chronic diseases. Lower physical activity, lower engagement in physical activity programmes and poorer health are evident in people from low SES backgrounds. A number of factors determine physical activity behaviours, however, previous research in these populations have focused on an individual level. The study qualitatively explores the multiple determinants of PA in adults from low SES neighbourhoods in the Black Country.

Method: 217 people (age 18+ - 66+, male =51, female = 166, ethnicity = 74% White) from four low SES areas within the Black Country (Sandwell = 58, Dudley = 44, Walsall = 62 and Wolverhampton = 53) took part in semi-structured focus group discussions. All interviews were audio-taped, transcribed verbatim and analysed using thematic analysis and using the socio-ecological model (McLeroy, 1988).

Results: The findings show multiple factors (individual, socio-cultural, physical environment, policy) determine physical activity patterns across all boroughs in support of the socio-ecological model. Unique physical environment and policy barriers were identified for specific boroughs, showing some heterogeneity.

Conclusion: Multi-dimensional factors provide barriers to physical activity behaviour in low SES. Tailoring interventions that address these multi-dimension factors may facilitate PA behaviours in low SES populations.

PO.66

A systematic review of the factors associated with active commuting

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SIG: Yes, Policies and environments

Awards:

Purpose: Active commuting (walking and cycling to work) has the potential to increase the physical activity levels of the working population and is positively associated with many health outcomes (U.S. Department of Health and Human Services, 2008). Using an ecological approach, this study aimed to systematically review potential factors associated with active commuting.

Methods: Electronic searches of Ovid MEDLINE (R) via Ovid, Global Health via Ovid, PsycINFO, EMBASE, PubMed, Cochrane Central Register of Controlled Trials and Google Scholar with no date restrictions were performed. Eleven studies, which reported at least one correlate of active commuting from a population of employed adults and reported an outcome measure of active commuting, were analysed using semi-quantitative analysis and a narrative synthesis. Potential factors were classified as individual, interpersonal, environmental or policy according to the socio-ecological model of Sallis et al, (2000).

Results: The majority of studies reported individual and demographic factors associated with active commuting. Males were more likely to report active commuting and adopt cycling as the main mode of travel. Higher occupational class and higher income were positively associated, while car ownership was negatively associated with active commuting. Factors in the interpersonal, environment and policy domains were not as frequently assessed, leading to inconclusive findings for correlates in these domains. However, some environmental factors, such as distance to work and workplace car park facilities, were negatively associated with active commuting.

Conclusion: This review highlights the paucity of high quality studies that have examined potential factors associated with active commuting in adults. Multi level ecological studies that are longitudinal or experimental in nature are urgently needed to strengthen the evidence base in order to inform the development of interventions.

PO.67

Accuracy of three Android-based smartphone applications in counting steps.

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SIG: Yes, e- & mHealth

Awards:

Purpose:

Despite the wide use of pedometer smartphone applications (apps), the validity of these apps in counting steps have yet been determined. This study aimed to assess the validity of the three popular free Android-based pedometer apps in a laboratory setting.

Methods:

Three most popular free pedometer apps in September 2014, namely the Runtastic, Pacer Works, and Tayutau, were downloaded from Google Play into a test smartphone (Samsung Galaxy S4 GTI9500). Thirty-five participants (11 males, 24 females; mean age 22.3±1.4 years) each carrying the smartphone with installed apps, completed three-minute bouts of walking on a treadmill at five speeds (2.0, 2.5, 3.0, 3.5, and 4.0mph). Each participant repeated the experiment thrice, placing the test smartphone either in their pants pockets, at waist levels, or on their left arms. Using paired-t tests, the step counts recorded by the three apps were compared to those of a tally counter at five walking speeds and three smartphone locations.

Results/findings:

Compared to the actual step count, the averaged absolute percent error were 12.6%, 13.5%, and 2.4% for Runtastic, Racer Work, and Tayutau, respectively. Runtastic significantly underestimated steps at all conditions. At all speeds, Pacer Works significantly overestimated steps when the smartphone was placed in the pocket or secured to the waist, but underestimated steps when the smartphone was secured to the arm by an armband. Tayutau produced step counts comparable to a tally counter, except when the smartphone was worn on the arm at 3.0 and 4.0mph.

Conclusions:

Runtastic and Pacer Works were inaccurate in counting steps at varying walking speeds and smartphone locations. Tayutau had the most accurate step counts among the three Android-based pedometer apps.

PO.68

Latino Family Childcare Providers' Beliefs, Attitudes, and Practices Related to Promotion of Healthy Behaviors among Preschool Children: A Qualitative Study

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SIG: Yes, Early care and education

Awards:

Purpose: The continuing rise of obesity among Latinos is a public health concern with an immediate need for early prevention. Changes in family structures have increased demand and reliance for child care for young children. Latino children are the fastest growing segment of the child population in the United States, and research shows that Latino families use preschools and day care centers much less than those of other ethnic groups, apparently because of cultural preferences for family-like care. Given that many low income Latino children attend family child care homes (FCCHs), there is a need to explore the role that FCCH providers may play in establishing and reinforcing children's early healthful eating and physical activity behaviors and consequently in the prevention of childhood obesity.

Methods: Using purposive sampling, six focus groups were conducted in Spanish with licensed Latino FCCH providers (n = 44). Data was analyzed using content analysis to identify recurrent themes.

Results and Findings: Latino FCCH providers described how they play an influential role in promoting healthful eating and physical activity behaviors of preschool children in their care. They also identified many barriers and challenges in establishing and maintaining healthful nutrition and physical activity behaviors, including high cost of healthy foods, cold weather, and physical environment of FCCH.

Conclusions: Given FCCH providers established presence in their communities, they are well positioned to facilitate low-income families' access to evidence-based information in a linguistic and culturally sensitive way. Latino providers have established trusting and respected relationships with Latino parents, which positions their family child care homes as an important venue for the delivery of long-term and sustainable efforts to promote healthful eating and physical activity behaviors and prevent childhood obesity among at-risk, minority communities. The potential role of minority FCCH providers should be explored in future community-based interventions aimed at promoting healthful family behaviors related to nutrition and physical activity

PO.69

Alliance among low education and elevated universal cardiovascular risk in Albania

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SIG: Yes, Early care and education

Awards:

Aim:

This survey was intended to assess the collision of instructive status on universal cardiovascular risk in Albanian population.

Methods:

This survey involved 430 successive outpatients aged 16 years and older. Educational situation was classified in relation to the years of official education like: (1) low education cluster (<10 years) and (2) average-high education cluster (10-15 years). In both clusters, cardio metabolic co morbidities (obesity, , diabetes, dyslipidemia, metabolic syndrome, microalbuminuria) and universal cardiovascular risk, consistent with the global principles, were evaluated.

Results:

The low education cluster was distinguished by a considerably elevated prevalence of subjects with visceral obesity ($P=.021$), hypertension ($P=.010$), metabolic syndrome ($P=.000$), and microalbuminuria ($P=.000$) and larger universal cardiovascular risk ($P=.000$). Extensively amplified levels of microalbuminuria ($P=.000$) and notably diminished rates of E/A proportion ($P=.000$) were also perceived in the low education cluster. Universal cardiovascular risk associated directly with waist-to-hip ratio ($P=.010$), microalbuminuria ($P=.015$), and the metabolic disorder ($P>.012$) and inversely with educational position ($P=.000$). Instruction was autonomously ($P=.000$) correlated with universal cardiovascular risk.

Conclusion:

These records show a strong alliance among low instruction and cardio metabolic co morbidities appropriate to persuade the progression of chronic degenerative illnesses. Preventive policies require to be more well-organized and efficient in this population.

PO.70

A pragmatic evaluation of the effectiveness of an exercise DVD for older adults

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: To evaluate the impact of an 'At Home' exercise DVD in terms of increasing cardiovascular fitness, strength, and flexibility amongst adults aged 50+ in a community setting.

Methods: We used a 'before-and-after' study design, collecting data by telephone from 51 participants before receipt of the exercise DVD and then after receipt, some 3 to 5 months later. At both time points, we conducted a quantitative assessment of participants' levels of cardiovascular fitness, strength and flexibility using a validated measure – the Telephone Assessment of Physical Activity (TAPA) questionnaire. In addition, at the 'after' time-point only, we conducted a qualitative assessment of physical activity using semi-structured interviews. For each of the three measures of physical activity, we calculated the proportion of participants whose physical activity level remained the same, increased, and decreased.

Results: The quantitative results of the TAPA questionnaire indicate that for each physical activity measure most participants experienced no change; for cardiovascular fitness equal proportions of participants experienced an increase and a decrease; whilst for the strength and flexibility measures, more participants experienced an increase than a decrease. Conversely, the qualitative results indicate a substantial increase in all three measures of physical activity associated with receipt of the DVD. Our findings suggest that the primary reason for this discrepancy relates to the quantitative results, where participants' TAPA scores at the 'before' time-point were over-estimated.

Conclusions: Receipt of this 'At Home' exercise DVD was associated with increases in some aspects of physical activity in older adults. To our knowledge, this study represents the first attempt within the UK to assess strength and flexibility measures of physical activity in older adults using a telephone interview. We have identified several limitations of the TAPA telephone questionnaire method, and we outline suggestions as to how its usability and reliability might be improved in future community-based studies of this type.

PO.71

Effectiveness of a diet behaviour modification treatment for weight loss among postpartum women: results from the randomized controlled LEVA in Real Life Study

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: We here report results of a 12-wk diet behaviour modification treatment aimed at producing weight loss among postpartum women within the primary health care setting in Sweden. The purpose of the ongoing trial is to evaluate effectiveness of the treatment when implemented within ordinary care.

Methods: During 2011-2014, 110 women with a self-reported body mass index (BMI) of ≥ 27 kg/m² at 6-15 wk postpartum were randomly assigned to diet behaviour modification group (D) or control group (C). Women randomized to D-group received individual behaviour modification treatment by a dietician at the primary health care clinic for 1.5 h and were instructed to implement a diet plan based on the Nordic Nutrition Recommendations. The diet plan aimed to produce an energy intake reduction of 500 kcal/d in order to achieve a weekly weight loss of 0.5 kg and a final loss of 6 kg after 12 wk. The women were instructed to self-weigh three times/wk and received reinforcement and feedback on their performance through bi-weekly cell phone text messages and a follow-up phone call after 6 wk of intervention. Women randomized to C-group received no dietary treatment but were given a brochure on healthy eating. The primary outcome was change in body weight. Dietary intake and physical activity were assessed using a telephoned 24-h recall and 7-d pedometer data.

Results: At baseline, the women had a mean (SD) BMI of 31.7 (3.7) kg/m² and the majority were breastfeeding (85 %). Women randomized to D-group had a median [interquartile range] weight loss of -6.1 [-8.4; -3.2] as compared to C-group -1.6 [-3.5; -0.4] kg, $p < 0.001$. Changes in reported energy intake (-775 (819) vs -203 (788) kcal/d, $p = 0.001$) and step count (+1292 (2355) vs -510 (2768) steps/d, $p = 0.001$) were significantly different between the two groups. Follow-up was completed by 100 women (91%).

Conclusions: These short term results suggest that diet behaviour modification treatment delivered by a dietician within the primary health care setting can produce initial and clinically relevant weight loss among postpartum women with overweight and obesity. Long term effectiveness of the treatment (1 and 2 y) will be further explored.

PO.72

The development of a UK Virtual Supermarket

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The majority of food in the UK is purchased in supermarkets; this makes them an important environment for influencing food purchasing decisions. Randomised controlled trials are costly, time consuming and difficult to conduct in real stores therefore alternative approaches are needed to gather evidence, particularly with respect to policy level interventions such as food taxes. Virtual Supermarkets are a possible approach to serve this goal and have already been successfully used in the Netherlands and New Zealand to conduct trials of pricing interventions. We developed a UK Virtual Supermarket which we aim to use in randomized controlled trials of supermarket-based interventions.

Methods: The UK Virtual Supermarket is a graphical 3D representation of a real supermarket based on a Dutch prototype. To build a representative UK model, we surveyed several small UK supermarkets and generated maps to determine the percentage of shelf space allocated to each food category. The product range and the 'top sellers' in a market leader's online store were then used to determine the specific products to be selected within each category. For selected products, 3D models of each product were created and placed into the UK Virtual Supermarket scene. Additional changes were made to the introductory scenes to adapt them to the UK context.

Results/findings: 535 UK food products were systematically selected and mapped to create a representative UK Virtual Supermarket. The methods used to build the UK Virtual Supermarket might be useful for other researchers when developing similar software. Software testing is planned for July 2015.

Conclusions: The development of the UK Virtual Supermarket utilized surveys of real life small stores, and online product range to aid researcher decisions. This is the first UK Virtual Supermarket to be created for research purposes and may be a useful tool for examining the possible effects of interventions. We plan to conduct further studies to determine the validity and reliability of this tool in the UK context. The similarity of the UK Virtual Supermarket with existing Dutch and New Zealand versions may also enable cross-country comparisons of the effectiveness of interventions to be made in the future.

PO.73

Healthful food buying. Relationships with demographics, nutritional orientation and knowledge, and in-store shopping habits

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SIG: No, this does not fit in any of the special interest groups

Awards:

Aims: Models of consumer behavior have not yet clearly defined the factors that explain or influence buying behavior. Therefore, the aim of this study was to test a comprehensive model of healthful food buying, consisting of demographics, nutritional-related aspects, and in-store shopping habits.

Methods: Based on the literature and qualitative research findings, a survey was designed to capture information on demographics (age, gender, socioeconomic status), nutritional-related aspects (level of health consciousness, objective nutrition knowledge), in-store shopping habits (high-quality-seeking, value-shopping, label use, gratification-seeking, brand loyal/habitual, novelty-seeking, convenience-seeking and family pleasing), and self-reported buying behaviour (frequency of product purchase on 22 healthful food items). The survey was completed by a nationally representative sample (gender, age, social class, country) of 1010 adults aged ≥18 years living on the Island of Ireland, who were either partly or wholly responsible for their household's food shopping.

Results: Overall, demographics, nutritional-related aspects and in-store shopping habits explained 22.1% of the variance in healthful food buying in our sample. The largest part of the explained variance was due to in-store shopping habits ($R^2=8.5\%$) and nutritional-related aspects ($R^2=8.4\%$), whereas demographics ($R^2=5.2\%$) were less important for predicting healthful food buying. Within the group of in-store shopping habits, high-quality-seeking, label use, family pleasing and novelty-seeking positively predicted healthful food buying, while gratification-seeking negatively predicted healthful food buying. With regard to the nutrition-related aspects, participants who were more health conscious and who had higher objective nutritional knowledge purchased more healthful food. In the demographic variables, women and participants from higher social class groupings purchased more healthful food.

Conclusion: Our results show that participants who are more mindful about their food choices make more healthful food purchases and that participants who buy in response to their mood are more prone to making less healthful food purchases. Consumers' mindfulness of their food and beverage purchases should be raised in order to promote healthful buying behaviour and consumers should be encouraged to form implementation intentions to overcome the unwanted effect of mood in-store. This material is based upon works supported by safe food, The Food Safety Promotion Board, under Grant No. 16-2010.

PO.74

Effects of motivational types on well-being and intention to continue being active among university sport participants

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SIG: Yes, Motivational Dynamics

Awards:

Objective: Self-Determination Theory (SDT) has suggested that the type of motivation - autonomous and controlled motivation - is generally more important than the amount of motivation in predicting life's important outcomes (Deci & Ryan, 2000). Based on SDT, this study examined the role of motivational types on well-being indicators (i.e. subjective vitality and life satisfaction) and on intention for continuing sport participation among university students.

Methods: Participants were 491 university students (39.1% female) between 18 and 29 years old ($M = 21.58 \pm 2.86$ years) and trained a mean of 3.21 days per week ($SD = 1.41$). Data were collected using a self-administered survey. Participants were assured of confidentiality and anonymity. We computed a series of partial correlations to examine unique associations among study variables and autonomous motivation, controlling for controlled motivation and vice versa.

Results: Partial correlation between well-being and autonomous motivation (controlling for controlled motivation) was significant (vitality $r = .37, p = .000$; life satisfaction $r = .13, p = .004$), whereas the partial correlation between well-being and controlled motivation (controlling for autonomous motivation) was no longer significant (vitality $r = -.01, p = .85$; life satisfaction $r = .01, p = .77$). Partial correlation between intention to continuing participation and autonomous motivation was significant ($r = .38, p = .000$), whereas partial correlation between intention and controlled motivation was no longer significant ($r = .02, p = .61$).

Conclusions: The present findings provided support for the notion that autonomous motivation predicts greater psychological well-being and persistence in the sport domain among university students. We suggest enhancing autonomous motivation to improve psychological well-being and to prevent dropouts in sports.

PO.75

Factors related to Spanish adolescents' level of moderate to vigorous physical activity during physical education classes

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The main objective of this study was to analyze what personal, psychosocial and environmental factors are associated with moderate to vigorous physical activity (MVPA) during physical education lessons.

Methods: The sample consisted of 189 students (M = 16.27 years, SD = .73) from nine high schools of Valencia, Spain. Physical activity was measured by accelerometer monitoring.

Results: The results indicated that boys performed more MVPA, specifically, during sessions in which fitness activities (cardiorespiratory endurance and strength) and, net games and sports were performed. The highest levels of MVPA occurred among students with high physical self-efficacy and when lessons were held outdoors, in schools with high socio-economic status and, in cardiorespiratory fitness and invasion games and sports.

Conclusions: Several factors were associated with MVPA, and these are promising targets for interventions to promote PA among Spanish adolescents.

PO.76

Ecological correlates of desk-based employees' workplace sitting and sitting-breaks

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Prolonged sitting is a health risk factor, one that is independent of the risks associated with insufficient physical activity, and one that is ubiquitous to the modern desk-based workplace. The present study applied an ecological perspective to examine the intrapersonal, interpersonal, and policy-environmental factors relevant to workplace sitting and sitting-breaks by desk-based employees. This cross-sectional study aimed to improve the understanding of factors, relevant to accumulated sitting and taking breaks from sitting in desk-based workplaces.

Methods: 221 desk-based employees were recruited via an online database of businesses in metropolitan Melbourne. They completed an online questionnaire, pertaining to work hours spent sitting and frequency of breaks from sitting per working hour, and various policy/environmental (e.g., OH&S support, workplace information, physical opportunities), and interpersonal (e.g., work colleagues sitting-breaks, management support), and intrapersonal (e.g., age, sex, self-efficacy, habit etc.) factors potentially relevant to sitting and taking breaks from sitting at work. Independent variables that were significantly associated bivarially ($p < 0.1$) with workplace sitting and sitting-breaks, were entered into multivariate linear regression models in order to examine associations with workplace sitting and frequency of sitting-breaks.

Results: Overall, the desk-based employees reported 6.93 hrs sitting at work and 1.61 breaks from sitting per working hour. Several intrapersonal and policy-environmental factors were significant in the bivariate analyses, particularly in relation to sitting-breaks. In the final multivariate model for workplace sitting, none of the bivariate predictors uniquely predicted variance, and the model explained 10% of the variance. For workplace sitting-breaks, the habit of taking sitting-breaks and the perception that workplace sitting is not detrimental to health, were associated with increased frequency of sitting-breaks. The multivariate model explained 25% of the variance in sitting-breaks.

Implications: Consideration of various ecological factors can enhance understanding of workplace health behaviours. Mainly intrapersonal factors were associated with the frequency of sitting breaks. However, further research is needed to better understand the time spent in workplace sitting; in particular, physical, policy and sociocultural environmental factors.

PO.77

Peer Influences, Social Norms, Self-Efficacy and Information Communication Technology (ICT)-Based Sedentary Behavior among the Working-age Population

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Through the lens of social cognitive theory, it can be seen that human behavior is affected by personal and environmental factors, and the purpose of this study was to examine the association between perceived peer influences, social norms, self-efficacy and ICT-based sedentary behavior among the working-age population in Thailand. Since ICT has become an integral part of everyday life for a large number of people, especially the working-age population, study of physical inactivity driven by ICT is a major challenge for public health practice.

Methods: An online survey was distributed to adults aged 21-45 years from January to February 2015. The respondents also disseminated the online survey amongst their own networks of colleagues and posted the link on their Facebook page. A total of 439 respondents took the online survey. The survey instrument consisted of 31 items that emphasized examining ICT-based sedentary behavior during the week day and on the weekend, perceived peer influences, and perceived social norms regarding the use of ICT, as well as the perceived self-efficacy in participating in vigorous physical activities. Data were obtained analyzed using descriptive statistics and the Pearson Product-moment correlation coefficient at a 0.05 level of confidence.

Results: The findings demonstrated that approximately fifty percent of the respondents used a computer or laptop about 6 hours per day. Other main ICT-based sedentary behaviors for the working-age population in Thailand were using Facebook, Line, Instagram, and Twitter. Furthermore, the results showed that perceived self-efficacy in terms of engaging in vigorous physical activities and social norms failed to show a significant influence on ICT-based sedentary behavior. However, perceived peer influence in engaging in ICT was positively associated with the time spent using ICT at $p < .05$.

Conclusion: Peers have a profound positive influence on ICT-based sedentary behavior among the working-age population in Thailand. It is recommended that the Ministry of Public Health Thailand should tailor peer-to-peer exercise campaigns to encourage working-age adults to take up sports instead of sitting and using ICT for long periods of time. Moreover, the private sector should introduce non-sitting work policies to strengthen a healthier *lifestyle in the workplace environment*.

PO.78

Analysis of the moderating effect of area deprivation on the impact of the WIXX multimedia communication campaign on children's physical activity

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Research shows the positive or negative influence of neighbourhood characteristics on physical activity (PA). This study examined the moderating effect of area deprivation on the impact of the WIXX multimedia communication campaign on children's self-reported PA.

Methods: This study adopted a repeated post-test design. A cross-sectional population-based telephone survey was conducted nine months after the campaign launch (September 2012) in the Province of Québec, Canada. A random digit-dialing procedure was used to recruit 1001 families with a child aged 9 to 13 years. The first year core components of the WIXX campaign included paid advertisements, community-based activities, and the development of local partnerships. Three separate websites were developed to reach children, parents, and practitioners. Material and social area deprivation indices from the 2006 Canadian Census were linked to respondents' neighbourhoods (defined as census dissemination areas) using postal codes. Neighbourhoods were dichotomized as high [fifth quintiles: 1] versus low deprivation neighbourhoods (the other quintiles [0]) for each indicator. Interaction terms were created between deprivation and exposure to the campaign (unaided/aided recall [1] versus no/other recall [0]). Recall and PA were self-reported by the children and postal codes were reported by parents. Analyses were stratified by sex. The moderating effect of area deprivation was examined using logistic regression.

Results: Analyses revealed no significant interaction between area deprivation and exposure to the WIXX campaign on tweens' levels of PA. There was no difference in the likelihood of being active between the girls who were exposed to the campaign and lived in high material (OR=0.7; 95%CI:0.2, 1.8) and social (OR=1.2; 95%CI:0.4, 4.3) deprivation areas and the girls who were not exposed to the campaign and lived in highly deprived areas and those living in more affluent areas (exposed or not). Similarly, levels of participation in PA among boys who were exposed to the WIXX campaign and living in highly deprived areas (material: OR=1.2; 95%CI: 0.4, 3.4 and social: OR=0.7; 95%CI: 0.2, 2.5) were not significantly different from their counterparts.

Conclusions: Results suggest that residential level of deprivation is not associated with differential impacts of the WIXX campaign on children's level of PA.

PO.79

Participation Trends in Holistic Movement Practices: A 10-year comparison of Yoga/Pilates and T'ai Chi/Qigong use in Australia

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SIG: Yes, Policies and environments

Awards:

Objective:

Holistic movement practices, such as yoga and t'ai chi, are increasingly being investigated in terms of their physical and mental health benefits. Few studies have examined the prevalence and participation patterns of these practices, however, nor their changes over time. Our aim was to describe the participation trends in yoga/pilates, and t'ai chi/qigong in Australia over a 10 year period, using the Exercise, Recreation And Sport Survey (ERASS).

Methods:

The ERASS comprised an Australia-wide random telephone survey stratified by state and territory, conducted quarterly, 2001-2010 (yearly N's range =12,043-18,734). Respondents were asked to list up to 10 types of physical activity they had participated in during the past 12 months. Prevalence rates were calculated as percentages of the total population, based on Australian Bureau of Statistics projections.

Results:

Participation in yoga/pilates doubled between 2001 and 2002, from 1.5% to 3%, then increased steadily to 3.4% in 2005, followed by a small drop between 2006 and 2009, and a rise to 3.5% in 2010. Participation rates for t'ai chi/qigong were lower, fluctuating between 0.5% and 0.7%, with no noticeable changes over the 10 years. For both practices, prevalence rates were considerably higher for females than for males, with some fluctuation in ratio across the decade. For age, the highest prevalence was in the 35-54 age group for yoga/pilates, and in the 55+ age group for t'ai chi/qigong. Substantial increases, with some oscillation, were noticeable across the decade for all three age groups (15-34, 35-54, 55+) in yoga/pilates. In contrast, only the 55+ age group increased participation slightly in t'ai chi/qigong.

Conclusions:

The majority of Australian adults do not participate in holistic movement practices. While still low, participation in yoga/pilates increased between 2001 and 2010, predominantly among the female population. In t'ai chi/qigong, on the other hand, participation rates remained low and stable. Investigating the factors that contributed to the growth of yoga/pilates versus the relative stagnation of t'ai chi/qigong may help shed light on possible avenues of increasing participation in t'ai chi/qigong. What could make these practices more attractive to men may also be a useful focus for future studies.

PO.80

Associations between access to recreational physical activity amenities and body mass index in Scottish adults.

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SIG: Yes, Policies and environments

Awards:

Objective: The aim of this country-wide study was to link individual health and behavioural data with area-level data to examine whether the body mass index (BMI) of adults was associated with access to recreational physical activity (PA) amenities by different modes of transport (bus, car, walking, cycling) and the extent to which any associations were mediated by PA participation.

Methods: Data on individual objectively-measured BMI, PA (number of days of (a) ≥ 20 minutes of moderate-to-vigorous PA, and (b) ≥ 15 minutes of sport or exercise, in previous 4 weeks), and socio-demographic characteristics were obtained from the 2003 Scottish Health Survey, a nationally representative sample of 6365 adults. The number of accessible PA amenities per 1,000 individuals in each area (data zone: n=6505, median population size=775) was obtained by mapping a representative list of all fixed PA amenities throughout mainland Scotland. A novel transport network was developed for the whole country, and routes on foot, by bike, by car and by bus from the weighted population centroid of each data zone to each amenity were calculated using Geographic Information System software. Separate multilevel models were fitted to examine associations between BMI and each of the 24 measures of accessibility of PA amenities, adjusting for age, gender, longstanding illness, car availability, social class, dietary quality and urban/rural classification.

Results: We found evidence of an association ($p < 0.05$) between BMI and 7 (29%) of the accessibility measures, all in the expected (negative) direction suggesting that mean BMI decreases with increasing accessibility of amenities. None of these accessibility measures were found to be associated with PA participation.

Conclusions: Our national study has shown that some measures of the accessibility of PA amenities by different modes of transport (particularly by walking and cycling) were associated with BMI; but PA participation, as measured here, did not appear to play a part in this relationship. Understanding the multi-factorial environmental influences upon obesity, including locational choice, use and experience of PA amenities, is key to developing effective interventions to reduce it.

PO.81

Project Energise: Describing the patterns of objectively measured desk sitting, sedentary behavior and physical activity of Australian office workers.

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Energise is an Australian Heart Foundation funded project which aims to test the feasibility of reducing and breaking occupational sitting in office workers. This study examines the baseline characteristics, and objectively measured desk sitting time (ST), sedentary behavior (SB) and physical activity (PA) of Australian office workers during work, outside work and during the weekend.

Methods: Eighty-one office workers (56 men, aged 44.7+11.8 years, 28.1+ 5.0 kg/m²) were recruited from three city-centre worksites. A sitting pad designed to objectively measure workplace desk sitting was used to record participants' ST over a month. A wrist-worn Geneactiv accelerometer was used to measure SB and PA over 7 days. Chi-square was used to compare demographic characteristics by tertiles of ST (low, moderate and high); ANOVAs examined differences in SB and PA during work, outside work, and during the weekend.

Results: Participants spent most of their workday sedentary (59%; 566+117 mins) and progressively less of this time in light (31%; 299+97 mins) and moderate-to-vigorous (10%; 99+43 mins) PA. Less time was spent in SB (48%; 423+116 mins) and more time in light (40%; 348+100 mins) and moderate-to-vigorous (12%; 110+57 mins) PA on a weekend, although these differences were non-significant. Participants spent a mean of 532+59 mins at work; 70% of this time was spent sitting at desks (369+69 mins). Participants in the highest tertile of ST spent significantly less time (13 mins) in moderate PA during work than those who sat least (32+15 mins vs. 45+20 mins, p=0.02). A small but significant difference in vigorous PA was observed between those categorised in low and moderate ST tertiles (3+5 mins vs. 1+2 mins, p=0.03). No compensatory effects in PA outside of work or during the weekend were observed in high ST or SB work time participants.

Conclusions: The findings of this study provide valuable objective data on the typical patterns of ST, SB and PA in Australian office workers. Interventions must consider the important context of high ST at work and that office workers with high ST do not compensate long periods of sitting with PA outside work and on the weekend.

PO.82

The Role of Self-Efficacy in the Initiation and Maintenance of Physical Activity: A Systematic Review

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Self-efficacy is an important determinant of physical activity. However, how best to change self-efficacy to bring about both the initiation and maintenance of physical activity remains unclear. Existing research has also highlighted that different behaviour change techniques (BCTs) may be required for initiating and maintaining self-efficacy and physical activity changes in different adult populations. The objectives of the present research were: 1) to identify which specific BCTs are included in the most effective interventions for initiating and maintaining physical activity self-efficacy and behaviour in adults, 2) to identify which clusters of BCTs are included in the most effective interventions for initiating and maintaining physical activity self-efficacy and behaviour in adults, 3) to assess whether changes in self-efficacy are associated with changes in physical activity behaviour, and 4) to investigate whether the relationship between self-efficacy and physical activity is moderated by outcome expectancies.

Methods: A systematic review with meta-analysis yielded 237 randomised trials aimed at changing self-efficacy for physical activity of adults. Intervention content was coded using the BCTv1 Taxonomy. Analyses examined which individual BCTs and which clusters of BCTs were associated with changes in self-efficacy and physical activity. Moderator analyses were conducted to assess the effectiveness of BCTs across different adult populations, and for initiation compared with maintenance.

Results: BCTs most commonly used in interventions included: goal setting (behaviour), problem solving, action planning, self-monitoring of behaviour, and social support (unspecified). Many individual BCTs and clusters of BCTs were associated with outcomes in univariate analyses, although it was difficult to disentangle unique effects of specific BCTs due to clustering.

Conclusions: This review identified which individual and clusters of BCTs are likely to be effective at both initiating and maintaining physical activity changes.

PO.83

A longitudinal examination of the influence of biological maturation on BMI, psychological well-being, and sedentary behavior among Korean adolescents.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose. This study examined the links between biological maturation and body mass index (BMI; kg/m²), psychological well-being, and sedentary behavior among adolescent boys and girls over 12 months.

Methods. The analysis included 1,998 Korean adolescent boys and girls who participated in the Korea Children and Youth Panel Study. Self-reported sedentary behavior was categorized into academic-related (i.e., after-school tutoring, school homework, after-school tutoring homework, extra study time, reading), screen-based sedentary behavior (i.e., playing computer/video games, watching television), and time spent with friends. Structural equation modeling using maximum likelihood estimation and bootstrapping procedures was used to assess direct and indirect pathways between biological maturation in Grade 8 and health behavior in Grade 9 after controlling for household income and academic performance.

Results/findings. No direct effect of maturation on sedentary behavior was found for either boys or girls. Indirect effects of maturation on screen-based sedentary behavior and time spent with friends mediated by BMI were found among boys. Advanced maturation was associated with higher BMI among boys, and in turn, higher BMI ($\beta = -.26$; $p < .001$) predicted more time spent in screen-based sedentary behavior ($\beta = 1.11$; $p < .01$) and less time spent with friends ($\beta = -1.56$; $p < .01$) among boys.

Conclusions. Advanced maturation may have impacts on prolonged screen-based sedentary behavior and lower pro-social behavior among boys. These findings are relevant for developing interventions to discourage sedentary behavior among Korean adolescent boys.

PO.84

Validity and reliability of a brief self-reported questionnaire assessing fruit and vegetable consumption among pregnant women

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Results of a recent systematic review on the validity and reliability of self-reported measures of foods and nutrients in pregnancy indicated that food-frequency questionnaires (FFQ) have the strongest evidence of validity in assessing nutrition during pregnancy. The objective of the present study was to validate a brief self-reported questionnaire that can rapidly assess frequency of fruit and vegetable (FV) consumption over the past 7 days among pregnant women.

Methods: Pregnant women were recruited through e-mails sent to female students and employees of the local university. Participants received a first mailing in which they had to complete the self-administered questionnaire assessing FV intake and a 3-day estimated food record. They also completed a validated semi-quantitative FFQ administered by a nutritionist during a visit at the research center. In order to assess its temporal stability, respondents were asked to complete the FV questionnaire 14 days later in a second mailing. Validity was assessed by means of Pearson correlation coefficients and partial correlation coefficients adjusted for the experience of nausea in the past month. Reliability was evaluated by means of intra-class coefficients. All statistical analyses were computed using SAS.

Results: A total of 35 pregnant women completed the questionnaires in the first mailing. Participants' mean age was 31.3±4.6 years, their mean gestational age was 18.9±7.9 weeks and 62.9% of them were pregnant with their first child. Less than half (45.7%) of the sample reported having experienced nausea in the past month. FV intake assessed using the FV questionnaire was correlated to FV consumption measured using the estimated 3-day food record ($r=0.45$; $p=0.0091$) and using the interviewer-administered semi-quantitative FFQ ($r=0.62$; $p=0.0018$). Results were similar when controlling for experience of nausea in the past month. Data on the temporal stability was available for 26 women and the analysis indicated an intra-class coefficient of 0.76.

Conclusions: This brief self-reported questionnaire assessing frequency of FV consumption over the past 7 days has acceptable validity and reliability values. It represents an interesting alternative for researchers interested in assessing quickly and at low cost FV intake among pregnant women.

PO.85

Diet and physical activity interventions to prevent or treat obesity in South Asian children and adults: a systematic review and meta-analysis.

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective: There may be differential effectiveness in diet and physical activity interventions in South Asian populations compared with other ethnicities. This review assessed the effectiveness of interventions to prevent or treat obesity in South Asians living in or outside of South Asia and describes the characteristics of effective interventions.

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed. The protocol is registered as PROSPERO CRD42014008800. Five electronic databases were searched: ASSIA, Cochrane Controlled Trials Register, Embase, Medline and Social Sciences Citation Index. The search was limited to English language abstracts published between January 2006 and January 2014. Any type of lifestyle intervention of any duration set in any country that reported an anthropometric measure for children or adults of South Asian ethnicity was included. There was no restriction on the type of comparator; randomised controlled trials, controlled clinical trials, and before-after studies were included. Data extraction and quality assessment was conducted by two reviewers; results were synthesised through narrative and meta-analysis.

Results: 29 studies were included; 7 children, 21 adult and one mixed age. 16 studies were conducted in South Asia, 10 in Europe and 3 in USA. Effective trials included physical activity interventions in South Asian men in Norway and South Asian school-children in the UK. A home-based, family-orientated diet and physical activity intervention improved obesity outcomes in South Asian adults in the UK, when adjusted for baseline differences.

Meta-analyses of interventions in children showed no significant difference between intervention and control. Meta-analyses in adults showed improvement in weight from two trials adjusted for baseline differences (-1.82 kgs, 95% CI -2.48 to -1.16) and in unadjusted data from three trials following sensitivity analysis (-1.20 kgs, 95% CI -2.23 to -0.17). There was no evidence that interventions were more or less effective by country or socio-economic status.

Conclusions: Meta-analysis found an unclear picture of the effects of interventions on BMI for South Asian children, but did show an improvement in weight (but not BMI or waist circumference) for adults. Evidence of culturally appropriate approaches to and characteristics of, effective interventions in adults were also identified.

PO.86

Is a diet and lifestyle intervention feasible in African Caribbean prostate cancer survivors? Facilitators and barriers to dietary and lifestyle changes after a prostate cancer diagnosis: a qualitative study.

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose:

Diet and lifestyle may have a role in delaying prostate cancer progression, but current evidence suggests that prostate cancer survivors have suboptimal health profiles. Even less is known about the health behaviours of Black British men after a prostate cancer diagnosis. We explore the barriers and facilitators to positive dietary and lifestyle changes in African Caribbean men and the acceptability of a diet and lifestyle intervention in this population.

Methods:

We conducted 14 semi-structured in-depth interviews with African Caribbean men aged 52-80 diagnosed with prostate cancer. Participants were recruited via letter or at oncology follow-up appointments using purposive and convenience sampling. We used NVivo analysis software to sort and code the transcribed interviews and applied thematic analysis to identify themes.

Results:

Preliminary results show that a majority of the men did not change their diet and lifestyle after diagnosis. The lack of change is underpinned by men's perception of diet and cancer link, pre-cancer diet and lifestyle, and social norms on ageing and physical activity. Most men felt that they had a healthy diet and were doing sufficient physical activity for their age. Prostate cancer was regarded as a disease of older men and not related to diet and lifestyle. However, these men expressed concerns about weight gain. The younger men especially expressed a desire to lose weight and regain fitness after treatment to aid recovery. Finally, a reduced prostate-specific antigen (PSA) level was viewed as evidence that an intervention works and would motivate men to adhere to the intervention.

Conclusion:

Men in our study did not think a dietary and lifestyle intervention is needed after a prostate cancer diagnosis as they believed diet has no effect on prostate cancer and their PSA was under control. Convincing men that diet and lifestyle have a role in preventing prostate cancer recurrence and challenging norms of ageing and physical activity is key for developing an effective intervention in this population. To gain men's interest, the intervention should be framed as a way to help them get back in shape and regain fitness.

PO.87

Differential effectiveness of an exercise referral scheme on objectively measured physical activity outcomes as a function of age, gender, referral reason and level of social deprivation

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SIG: Yes, Motivational Dynamics

Awards:

Objective: The World Health Organization (2014) estimates that 3.2 million deaths each year are due to physical inactivity. Exercise referral schemes are used widely within the UK as behavioural interventions to increase physical activity (PA). However evidence on their effectiveness is mixed due to design heterogeneity (Pavey 2013) and reliance on self-reported PA. Moreover, the effectiveness of such schemes may vary depending on the client's background. In this work we examined the differential effectiveness of an exercise referral scheme on objectively measured PA outcomes as a function of age, gender, referral reason and level of social deprivation.

Methods: A prospective cohort study of 117 participants referred to a 12 week exercise referral programme in south west England wherein we examined changes in moderate to vigorous physical activity (MVPA), daily step count (DSC), and daily sedentary minutes (DSM). Physical activity was measured objectively at baseline, 3 and 12 months using ActiGraph GT3X+ accelerometers using Freedson et al (1998) cut points. Participant ages ranged between 17 and 80 years, 67% were female, and 59% lived within the two most deprived quintiles measured using the Index of Multiple Deprivation (IMD); 74% were referred due to high cardiovascular risk and 26% due to mild to moderate depression. Outcomes were assessed using an intention to treat analysis.

Results: One third (34%; n = 40) of participants completed the 12 week programme; this did not differ according to participant characteristics. There was a significant overall increase in MVPA (mean difference (MD) 24.32 minutes/week; t=2.56 p<.05) and DSC (MD 508.20 steps/day; t=3.19 p<.01) at 3 months. No significant differences in DSM were reported (MD -4.62 minutes/day; t=-0.93 p=0.35). Only changes in DSC remained significant at 12 months (MD 346.64; t=2.30 p<.05). Regression analyses showed that neither age, gender, referral reason or IMD had an effect on MVPA, DSC or DSM.

Conclusions: The findings suggest that exercise referral services have the potential to address health inequalities by providing equivalent short-term benefit to people regardless of age, gender or level of social deprivation. Further work is needed to improve sustainability of PA outcomes and promote patient retention.

PO.88

The National Study of Neighborhood Parks: Implications for Increasing Population Physical Activity

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SIG: Yes, Policies and environments

Awards:

Purpose:

The study's purpose was to quantify the use of neighborhood parks in the United States, identify factors that are associated with increased use and increased moderate-to vigorous physical activity, and to assess whether there were disparities in parks resources between high and low income neighborhoods. This is the first national study of neighborhood parks in the United States.

Methods:

We selected a representative sample of 25 US cities with a population >100,000 and, after enumerating eligible neighborhood parks between 3 and 20 acres, selected a random sample of 10-15% (n=174). We measured park use and park conditions during 12 hours of direct observation over 4 clement days (3 x per day) in the Spring and Summer of 2014. We assessed park management policies by surveying park administrators.

Results/findings:

Overall, the average park of about 8.8 acres saw 1553 person-hours of use per week, with 604 hours in moderate to vigorous activity/week. Most neighborhood parks were underutilized (target areas were vacant about 75% of all observations.) especially among seniors who represented about 4% of all park users, but 18% of the general US population. The strongest positive predictors of park use were population density, park size, and the presence of park programming. Neighborhood poverty level was negatively associated with park use. Walking paths were the park features that generated the most moderate to vigorous physical activity. On average parks were smaller in acreage in high poverty neighborhoods but there were no differences in park facilities by neighborhood socioeconomic status. However, there was more litter and graffiti in low-income parks. Litter was associated with 29% more park users. Parks systems do not routinely measure park use and do not have specific goals regarding increasing park use and park based physical activity

Conclusions:

Parks have an enormous potential to increase population based physical activity. However, parks require greater investments in programming and potentially adding features and facilities that are more likely to draw users. Surveillance of park use will help guide modifications to increase park-based physical activity.

PO.89

Leisure-time, occupational, and commuting physical activity and risk of depressive symptoms among Japanese workers: a cohort study

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Epidemiological evidence has shown that higher levels of leisure-time physical activity are associated with a lower risk of depression mainly in Western populations; however, the precise dose-response relationship remains unclear and evidence is scarce regarding other domains of activity. In addition, few studies addressed these issues in Asians. We investigated the associations of leisure-time, occupational, and commuting physical activity with risk of depressive symptoms among Japanese workers.

Methods: This cohort study included 29,082 Japanese workers aged 20 to 64 years who underwent annual health examination between April 2006 and March 2007 (baseline period) and did not have depressive symptoms, psychiatric disease, cancer, cardiovascular disease, and stroke at baseline with a maximum of 5 years of follow-up. Physical activity was self-reported. Depressive symptoms were assessed by self-reported 13 questions of subjective symptoms, developed for Japanese workers, which are similar to widely used depression scales. Multivariable-adjusted hazard ratio (HR) and its 95% confidence interval (CI) for incidence of depressive symptoms was calculated using Cox regression analysis.

Results: During a mean follow-up of 4.7 years, 6,177 developed depressive symptoms. Moderate- to vigorous-intensity exercise on leisure showed an inverse association with risk of depressive symptoms; the multivariable-adjusted HRs (95% CIs) were 1.00 (reference), 0.90 (0.82, 0.98), 0.84 (0.77, 0.92), 0.82 (0.76, 0.89), 0.72 (0.63, 0.83), and 0.80 (0.70, 0.91) for 0, <3.75, 3.75 to <7.5, 7.5 to <16.5, 16.5 to <25.5, and ≥25.5 MET-hour per week of exercise, respectively. Compared with sedentary workers, workers who stand or walk during work had the HR (95% CI) of 0.86 (0.81, 0.92) and fairly active workers had the HR (95% CI) of 0.90 (0.82, 0.99). Walking to and from work was not associated with depressive symptoms.

Conclusion: The results suggest that, even at very low dose, leisure-time physical activity can delay or prevent the development of depressive symptoms among Japanese workers. Workplace intervention including physical activity promotion may be needed for sedentary workers for mental healthcare.

PO.90

Costs-effectiveness of the statewide health promotion program "Join the Healthy Boat" in primary schools

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: As evaluations of costs are scarce, the purpose of this study is to assess the costs and execute an incremental cost-effectiveness ratio (ICER) of the statewide implementation of the health promotion program "Join the Healthy Boat" in primary schools in Baden-Württemberg, Germany.

Methods: Cluster-randomized intervention trial with wait-list control group. Implementation period comprised one year in the academic year 2010/11 with a before and after measurement. Anthropometric data of 1733 participating children (7.1 ± 0.6 years) were taken by trained staff, whereas parental anthropometrics were self-reported. Incidence of abdominal obesity was defined as new cases of waist-to-height ratio (WtHR) ≥ 0.5 . Overall costs of the intervention were assessed in great detail and separately displayed for two seminars for consulting teachers, three vocational trainings for participating teachers and personnel costs for each consulting teachers and the university staff. To identify costs per case of abdominal obesity averted for different underlying numbers of children, ICER was calculated.

Results: The overall intervention costs were €36,506.41 including costs for seminars of €2,164.49*, vocational trainings of €5,872.03* and the personnel costs for consulting teachers of €6,550.12 as well as for university staff of €21,919.82*. Costs per child/year were €25.04. The costs per incidental case of abdominal obesity averted were €1,514.92 for the intervention group with complete data sets available (n=847), €1,992.77 for the intervention group (n=955), €1,921.39 for all pupils in the intervention classes (n=1,458) and €1,926.15 for the expected children participating till the academic year 2013/14 (n=40,000).

Conclusion: This study demonstrated the affordability of a statewide health promotion program in primary schools. The costs per case of incidental abdominal obesity averted are low compared to the health care costs of obesity-related diseases. Therefore, interventions to prevent the early onset of abdominal obesity are highly recommended.

* small rounding differences

PO.91

Is obesity in women characterized by enhanced food reward?

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: To examine differences in food reward between normal-weight and obese women. We hypothesized that obese women show increased reward responses (implicit wanting and explicit liking and wanting) for high fat and sweet tasting foods compared to normal-weight women.

Methods: Data for the present analysis were collected at baseline in a randomized controlled trial to investigate the impact of nutritional labeling on appetite sensations, attitudes and food intake. Of the 160 participants recruited, a total of 150 normal-weight (BMI < 25.5 kg/m²; n=76) and obese (BMI ≥ 29.5 kg/m²; n=74) women, aged between 18 and 65 years old, completed all outcome measures. Components of food reward (implicit wanting and explicit liking and wanting) were assessed by the Leeds Food Preference Questionnaire. Height and weight were also measured and BMI was calculated (kg/m²). The differences between weight status and food reward related to two main food categories : high fat savoury (HFSA) and high fat sweet (HFSW) were analysed by paired samples t-tests.

Results: For HFSA, no significant difference was noted between normal-weight and obese women for explicit liking (33.77 ± 24.51 and 31.46 ± 24.54 for normal-weight and obese, respectively; *p*=0.57) or explicit wanting (32.29 ± 24.33 and 30.22 ± 24.25 for normal-weight and obese, respectively; *p*=0.60). However for HFSW, marginal differences were observed between normal-weight and obese women for explicit liking (36.28 ± 22.06 and 30.04 ± 21.85 for normal-weight and obese, respectively; *p*=0.08) and explicit wanting (35.32 ± 20.94 and 29.30 ± 21.34 for normal-weight and obese, respectively; *p*=0.08). No significant differences were observed between normal-weight and obese women regarding implicit wanting for either food category (*p*=0.70 to 0.93).

Conclusions: Findings in the present study suggest that BMI status (normal-weight vs. obese) is not well characterized by differences in components of food reward. Obesity is a highly heterogeneous condition therefore altered reward response may be associated with a sub-type of obesity or physiological, behavioral and psychological indices.

PO.92

Physical activity and sedentary behaviour measured in Pakistani and White British women participating in the Born in Bradford Cohort Study

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose:

This study examined levels of physical activity and sedentary behaviour measured in Pakistani and White British mothers participating in the Born in Bradford (BiB) cohort study. The study purpose was to investigate the influence of ethnicity and place of birth on these lifestyle behaviours.

Methods:

Analyses were conducted on data collected from mothers participating in the BiB 1000 sub-study who were surveyed when their child was 24-months old. Self-reported physical activity levels were assessed using the interviewer-administered IPAQ short, while sedentary behaviour was assessed using the Domain-Specific Sitting Time questionnaire. Total daily sitting times were calculated by summing sitting times reported across 5 domains (transport, work, TV viewing, using a computer at home, and other leisure activities). Reported time spent in moderate-to-vigorous physical activity (MVPA) and total daily sitting times were compared between White British participants, Pakistani participants born in the UK and Pakistani women born in Pakistan using Kruskal-Wallis tests with post hoc comparisons. The proportion of women in each group meeting government physical activity guidelines were also compared using Chi-squared tests.

Results/findings:

Completed questionnaires were obtained from 852 participants (mean [±SD] age 30±5.5 years, BMI 26.6±5.8 kg/m²). Reported weekly minutes spent in MVPA differed significantly between groups (White British [n = 342]: 172±339, Pakistani born in UK [n = 196]: 59±184, Pakistani born in Pakistan [n = 314]: 34.8±155 minutes/week, *p*<0.001; note: mean [±SD] data are presented for descriptive purposes as medium time spent in MVPA was 0 minutes/week for all groups). The proportion of women meeting the UK physical activity guidelines varied significantly across groups (White British: 31.9%, Pakistani born in UK: 13.3%, Pakistani born in Pakistan: 6.7%, *p*<0.001), as did daily sitting times (median [±inter-quartile range] White British: 367±199, Pakistani born in UK: 313±179, Pakistani born in Pakistan: 253±137 minutes/day, *p*<0.001).

Conclusions:

Pakistani women living in Bradford exhibit extremely low levels of physical activity, this is particularly pronounced in women who were not born in the UK. In contrast, these individuals displayed lower levels of sedentary behaviour. Interventions are urgently needed within Pakistani women living in Bradford to promote increases in physical activity.

PO.93

Do desk-based office workers using a sit-to-stand workstation compensate by increasing their sedentary time and reducing their physical activity at other times of the day?

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²Victoria University, Melbourne, Australia

SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

This study investigated whether the introduction of a sit-to-stand workstation among office workers led to reductions in sedentary behavior during working hours, and whether any compensatory changes in sedentary behavior and physical activity occurred outside working hours.

Methods:

A convenience sample of forty office workers (55% female, mean age: 31 years) were given a WorkFit-S, Sit-to-Stand Workstation for 12 weeks. Participants completed assessments at baseline (prior to workstation installation) and during 1-week, 6-weeks and 12-weeks post workstation installation. Sedentary behavior and physical activity were assessed using the ActiGraph GT3X+ accelerometer, which participants wore for 7-days during each measurement phase. Comparisons were undertaken between measurement periods using repeated-measures ANOVAs.

Results/findings:

Compared to baseline, the proportion of time spent in sedentary behavior decreased significantly during working hours from 68.5% to 64.5%, 65.3% and 66% at weeks 1, 6 and 12 respectively ($p < 0.01$). The proportion of time spent in light activity increased during working hours from 10.9% to 13.6%, 13% and 12.9% at weeks 1, 6 and 12, respectively ($p < 0.01$). During weeks 1 and 6, the proportion of time spent in sedentary behavior outside working hours increased significantly from 58% at baseline to 61% and 61.2% ($p < 0.01$). Corresponding reductions in light activity were seen during this period from 17.4% at baseline to 15.9% and 15.6% in weeks 1 and 6 ($p < 0.01$). No significant differences in the proportion of time spent in moderate-to-vigorous physical activity were seen outside working hours throughout the study ($p > 0.05$).

Conclusions:

Findings suggest the use of sit-to-stand workstations significantly reduces sedentary time and increases light activity during working hours, with the greatest changes occurring during the early weeks of workstation use. During this period however it appears that office workers compensate for this change in behavior by increasing sedentary time and reducing light activity during non-working hours. Interventions targeting workplace sitting should also target sedentary behavior outside work to limit behavior compensation.

PO.94

Attitudes towards active travel among home movers at different life stages: findings from a qualitative study

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University of Cambridge, Cambridge, UK

SIG: Yes, Policies and environments

Awards:

Objective: Active travel can provide opportunities to incorporate more physical activity in daily life. Moving home represents a substantial transformation in circumstances and can initiate an examination of commuting and other transport options. This qualitative study explored the attitudes of people at different life stages, who had recently moved or were about to move home, towards active travel.

Methods: Semi-structured interviews were conducted with a convenience sample of 21 participants aged 25-73 in the Relocation to New Environments (RENEW) study. Interviews lasted about 30 minutes on average and were recorded and transcribed. Thematic analysis was carried out by two of the authors and the themes were discussed and revised by all authors.

Results: Most participants were aware of physical activity as a means to maintain health and valued outdoor space in which to be active. Active travel was often used to increase or maintain physical activity levels. Health, convenience, enjoyment and environmental concerns were all cited as reasons for using active travel. Three broad categories of participants with differing priorities emerged in analysis. Older participants tended to attach greater value to their health and saw keeping active as a means to prolong their quality of life and independent living, although they also voiced concerns about the dangers of traffic. Younger participants without families tended to place more value on active travel as a convenient and inexpensive way to travel. While aware of its health benefits, they tended to regard these as a bonus rather than its main advantage. Participants in midlife were most varied in their attitudes. They prioritised open space and a less urban environment in which to bring up children, but often had longer, mixed-mode commutes for which access to public transport within cycling or walking distance was valued.

Conclusions: Movers at different life stages had different priorities and attitudes towards active travel. Given the aspiration to build mixed-age communities in line with the age-friendly city movement, the design of new residential developments should take account of this variety of perspectives.

PO.95

Variability in travel behaviour as a predictor of changes in active and car commuting: a natural experimental study.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Changing the environment can promote physical activity by changing how people travel. Summary measures of baseline behaviour, such as the overall proportion or duration of trips made by different modes of transport, are often included as covariates in analyses of behaviour change. However, other characteristics of baseline behaviour may affect the inclination to change at least as much. This study aimed to strengthen our understanding of the impact of variability in mode choice, which may correspond with different life circumstances and decision-making styles, on the likelihood of travel behaviour change.

Methods: Quasi-experimental analyses in a cohort study of 450 commuters exposed to a new guided busway with a path for walking and cycling in Cambridge, UK. Exposure to the intervention was defined using the shortest network distance from each participant's home to the busway. Variability in commuter travel behaviour at baseline was defined in three ways: the Herfindahl-Hirschman Index, the number of modes of transport used, and the dominance of a single mode. The outcomes were changes in the share of commute trips (i) involving any active travel, (ii) involving any public transport, and (iii) made entirely by car. Variability and changes in commuter travel behaviour were derived from a self-reported seven-day record collected before (2009) and after (2012) the intervention. Separate multinomial regression models were estimated to assess the influence of variability on behaviour change over time, both independently and as an interaction effect with exposure to the intervention.

Results: All three measures of variability predicted changes in mode share in most models, and the effect size for the intervention was slightly strengthened after including variability in the models. Commuters with higher baseline variability were more likely to increase their active travel share and decrease their car share in response to the intervention.

Conclusions: People reporting a higher level of variability in mode choice were more likely to change their travel behaviour in response to an intervention. Future research should consider such variability as a potential predictor and effect modifier of travel and physical activity behaviour change, and its significance for the design and targeting of interventions.

PO.96

Are our Moms Moving? Assessing physical activity levels during pregnancy in South African women.

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective: Although there is overwhelming evidence for the benefits of physical activity (PA) during the prenatal period, research from developed countries estimate that the majority of pregnant women are inactive. In developing countries, and South Africa (SA) in particular, women are vulnerable to inactivity and sedentary behaviours. Currently, there is a paucity on research addressing PA levels of pregnant women in South Africa.

Methods: This descriptive study aimed to subjectively assess physical activity levels and knowledge of pregnant women. The Pregnancy Physical Activity Questionnaire (PPAQ) and a previously used knowledge, attitude and practice (KAP) questionnaire was used. Nine antenatal clinics were approached for recruitment and 160 questionnaires were distributed in the central Johannesburg area.

Results/findings: One hundred and five (N=105) women completed the survey, a 66% response rate. Sedentary behavior attributed to the majority (53%) of total energy expenditure (EE) and the remaining was physical activity of varying intensities (light: 29%; moderate: 18%; Vigorous: 0.6%). Activities included household (43%) and occupational (55%), with only a small portion from exercise (2%). This despite the fact that the majority (74%) of women felt that exercise was beneficial. Possible barriers to an active pregnancy included fatigue (69%), lack of time (34%), lower back pain (34%) and lack of guidance from health care practitioners (28%). Popular sources of information regarding activity during pregnancy included books/magazines (71%) and family/friends (53%).

Conclusions: South African pregnant women appear to spend the majority of their day in sedentary activities, despite their knowledge and belief of the importance of an active pregnancy. Our findings suggest the need for appropriate education and interventions to improve PA levels during this critical time in a woman's life.

PO.97

Positive Affect Promotes Pursuit of Physical Activity Goals: Impacts on Goal Setting, Activation, Prioritization, and Attainment

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The present research tested whether positive affect promotes pursuit of physical activity goals. Four key features of goal pursuit were examined, namely, setting physical activity goals (Study 1), goal activation (Study 2), and goal prioritization and goal attainment (Study 3).

Methods: Participants were university staff and students ($Ns = 80, 81, \text{ and } 59$, in Studies 1-3, respectively) and were randomized to positive affect (joy, hope) or neutral affect (control) conditions in each study. Goal level, goal commitment, and means selection for physical activity were assessed via questionnaires in Study 1. Study 2 used a lexical decision task involving sequential priming to index the activation level of physical activity goals. Study 3 indexed goal prioritization via a choice task and used an objective measure of MET minutes to assess physical activity (goal attainment).

Results: Study 1 showed that positive affect led to a greater number of intended physical activities, and that joy engendered greater willingness to try activities; there were no effects on goal commitment. In Study 2, a positive affect induction led to heightened activation of the physical activity goal compared to the control condition. The joy induction in Study 3 had a marginal effect on goal prioritization (55% vs. 37%) and, led to greater physical activity.

Conclusion: These findings suggest that positive affect enhances the pursuit of physical activity goals. Implications for health behaviour theories and interventions are outlined.

PO.98

Exploring Maternal Influences on Preschoolers' Physical Activity and Sedentary Time

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SIG: Yes, Children and families

Awards:

Purpose: Physical activity is known to track from childhood to adulthood; therefore, promoting habitual physical activity in the early years is imperative. As parents are largely responsible for their preschoolers' actions, the physical activity behaviours and preferences of parents are likely to have an impact on their children's activity levels. Specifically, mothers have been found to be an important influence (e.g., through role modeling, co-participation in activities, etc.) for preschoolers' activity behaviours. Unfortunately, mothers of young children tend to engage in low levels of physical activity themselves, which consequently may impact the activity behaviours of their children. The purpose of this study was to determine which maternal influences predicted preschoolers' physical activity levels and sedentary time.

Methods: Preschoolers ($n = 39$) and their mother's physical activity and sedentary time were measured concurrently using Actical™ accelerometers for 7 consecutive days (i.e., 5 weekdays and 2 weekend days). Mothers were also asked to complete the adapted Environmental Determinants of Physical Activity in Preschool Children Parent Survey. This tool examines parental support (through co-participation, instrumental support, and encouragement) and mothers' enjoyment and beliefs of physical activity. Descriptive analyses were run to determine participants' hourly rates of physical activity and sedentary time. Direct entry regression analyses were used to determine which maternal influences best predict preschooler's sedentary, moderate-to-vigorous (MVPA), and total physical activity (TPA). Mother's activity levels and BMI were also explored as predictors for preschoolers' activity behaviours.

Results: Thirty-three preschoolers and 25 mothers had adequate physical activity data, and consequently were retained for analyses. Preschoolers and mothers spent 45.19 and 43.76 mins/hr in sedentary time, 1.26 and 2.21 mins/hr in MVPA; and 14.81 and 16.22 mins/hr in TPA, respectively. Considering all of the maternal influence factors entered in the regression model, mother's enjoyment of physical activity was the only significant predictor of preschoolers' sedentary time and TPA ($p < 0.05$), accounting for approximately 44% of the variation.

Conclusions: Mothers enjoyment of physical activity is an important predictor of preschoolers' activity behaviours. Further research on maternal influence is warranted to clarify and understand its impact on preschoolers' activity behaviours.

PO.99

Development and validation of a new Body Size Scale to assess body weight perceptions among African populations

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: The African social valuing of overweight could expose individuals to high-risk unhealthy eating behaviours and therefore become a risk factor of obesity. However, no accurate tool allows the comparative studies of body size perceptions among African populations to be conducted. We aimed to solve this problem by constructing and validating the Body Size Scale (BSS).

Methods: To construct the BSS, 80 Cameroonian and 81 Senegalese were included to cover a wide variability in African inter-ethnic anthropometry. These individuals were selected and photographed to encompass the variability in corpulence. Anthropometric measurements were used to assess the corpulence of individuals across three criteria: body mass index (BMI), percentage of fat and fat component (endomorphism) of the somatotype. To finalize the BSS, nine models were selected, for which the anthropometric characteristics were adapted to obtain a progressive weight gain scale that also represented the sample anthropometric variability in both men and women. A validation protocol measuring the construct validity (n=201), reliability (n=103) and convergent validity (n=1115) was completed among three samples of Cameroonian adults.

Results/findings: The BSS consists of two sex-specific subscales presenting nine models along an increasing continuum of three criteria of corpulence. Concerning the construct validity, most of participants were able to arrange BSS in the correct order, according to four different ways of defining the weights: spontaneous order, less big to the biggest, less fat to the fattest and less stout to the stoutest (men: between 0.60 and 0.87; women: between 0.45 and 0.74 for kappa coefficients). The correlation levels were good for the reliability (at least $p < 0.01$) and the concurrent validity ($p < 0.001$ for both sexes). Finally, levels of the sensitivity and specificity for the predictions of overweight/obesity, body self-satisfaction and desire to gain weight were reliable (between 51% and 95%).

Conclusions: The BSS is the first tool of photographic scales of humans developed from two African populations with pronounced differences of macroscopic phenotype. It is able to measure a reliable body size perception in Cameroonians (and potentially other African populations), and therefore could be used for the prevention of unhealthy eating behaviours associated with social valuing of overweight.

PO.100

Visual attentional processing of physical activity stimuli: the role of body weight status.

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¹Ulster University, Coleraine, UK, ²Queen's University Belfast, Belfast, UK

SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Whilst regular physical activity is a key component of maintaining energy balance, a large majority of the UK population remain inactive. Based on the theory of incentive sensitisation, it has been suggested that the effectiveness of physical activity information could be increased if it is targeted towards automatic cognitive processing systems. The aim of this study was to investigate differences in visual attention to physical activity related stimuli between normal weight and obese females.

Methods: Fifteen normal weight and thirteen obese adult females freely viewed physical activity stimuli matched to control stimuli whilst eye-movements were monitored using a desk-mounted eye-tracking system. Information on recent self-reported levels of physical activity was also collected.

Results/findings: Obese females attended to physical activity images for a significantly shorter duration than their normal weight counterparts ($p = 0.008$). There were no differences observed in gaze duration to physical activity stimuli between female participants who were meeting the current UK physical activity recommendations as compared to those who were not meeting the guidelines.

Conclusions: Body weight status may play a role in visual attention to physical activity related information with obese females being less attentive to physical activity images as compared to normal weight females. These findings suggest that not all population groups are equally as attentive to physical activity related stimuli and highlight the importance of considering the role of visual attentional processing when assessing the effectiveness of physical activity related information.

PO.101

Use of Global Positioning Systems for physical activity research in youth: Projeto ESPAÇOS Adolescentes, Brazil

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective: The purpose of this study was to present the methods for data collection using GPS units and assessment of context-specific physical activity and sedentary behavior, as well as describe results of the first project using such methodology in adolescents from a developing country.

Methods: Four domains were defined as important contexts: home, school, transport and leisure. A total of 381 families participated in the study, whereas 147 wore both accelerometer and GPS devices to objectively assess physical activity, sedentary behavior and geographic positioning.

Results: The final sample was composed by 45 adolescents who presented valid data for three weekdays of at least ten valid hours and one weekend day of at least eight valid hours. Participants were mostly girls (52.8%), and had a mean age of 14.7 years old, with a normal BMI (69.6%); 32% of the parents reported higher education degree and 66.8% of the sample was classified at the high socioeconomic status. There were no differences between total sample and valid GPS sample ($p>0.05$). Overall, 24-71% engaged in sedentary behavior and showed an average of 540 minutes per day; moderate to vigorous physical activity was found in 2-17% of participants with an average of 28.7 minutes per day. The majority of time spent by participants was in the leisure and home domains, each representing about 45% of the total time. Transport made up 7.4% of the average day and school only 1.2%.

Conclusions: The use of GPS and accelerometer data allowed the identification of the amount of time spent in physical activities and sedentary behaviors in four different domains. Though still a developing methodology, international detailed protocols helped to unveil the patterns of behavior of adolescents living a large city. This is a promising approach to understand interactions between people and environment in developing countries.

PO.102

Type 1 diabetes and exercise: An assessment of health care practitioners' knowledge.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Individuals with T1DM face specific challenges in glucose control around exercise that predisposes them to constant risks. Thus exercise avoidance is common, resulting in this cohort being physically inactive. Despite the understanding that physical inactivity is an issue among this population, little attention has been given to exploring health care practitioners' knowledge of physical activity for T1DM individuals. The purpose of this study was to examine the extent to which health care practitioners have the confidence, knowledge, and experience to provide guidance regarding physical activity to T1DM individuals.

Methods:

Data collection occurred through an open-ended survey. In total, 51 health care practitioners (16 female and 35 male) completed the survey. Of the 51 participants, 23 were consultants, 10 were specialist registrars, five were GPs, three were CT2 doctors, and the 10 participants comprised health practitioner researchers and clinical fellows. The survey comprised 23 questions, including demographic and education information, knowledge of different exercise considerations for T1DM individuals, and confidence in providing advice regarding exercise. Responses were analysed through content analysis, before being placed in a data matrix for comparison across participants.

Results:

Findings indicated that participants had very rarely received formal training regarding exercise for T1DM. Any education they had received was related to basic physiology of exercise rather than diabetic populations specifically. During their continuing development, some participants had attended individual lectures specific to this area, but many had not. Participants indicated very limited knowledge of specific exercise guidelines for the general population or for T1DM individuals. However, despite an apparent lack of training and knowledge regarding exercise, participants indicated being relatively confident (5-10 on a scale of 1-10) in their ability to advise T1DM individuals regarding their engagement in physical activity.

Conclusions:

The findings of this study highlight a clear disparity between practitioners' training, knowledge, and confidence in advising T1DM individuals regarding participation in physical activity. Such a disparity raises concerns regarding the accuracy of the information being provided to T1DM individuals and points to the need to ensure physical activity is more firmly embedded in health care practitioner training.

PO.103

High perceived stress is associated with unfavorable features of eating behavior in overweight and obese Finns of working age - on behalf of the Elixir study group

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Chronic stress is associated with emotional and uncontrolled eating, and increased intake of fatty, sweet or salty food products. The relations between stress and eating are studied mainly in laboratory settings but less in real world context. This study aims to describe the associations of eating behavior and dietary factors with perceived stress in overweight and obese adults of the Elixir study (Current Clinical Trials NCT01738256).

Methods:

Of the 339 randomized participants, those with all the needed data available (n=297, 84% females) were included to the cross-sectional analyses. The mean age was 48.9 y (SD=7.6) and laboratory-measured mean body mass index 31.3 kg/m² (SD=3.0). Perceived stress and eating behavior were assessed by self-reported questionnaires Perceived Stress Scale (PSS-14), Intuitive Eating Scale (IES), The Three-Factor Eating Questionnaire (TFEQ-R18), Health and Taste Attitude Scales (HTAS) and a preliminary Finnish translation of ecSatter Inventory (ecSI 2.0). Diet was assessed by 48-h diet recall and Index of Diet Quality (IDQ) questionnaire. For statistical analyses, the subjects were divided into tertiles according to the PSS scores. Main statistical analyses were conducted by analysis of variance (ANOVA).

Results:

Compared to the middle and lowest PSS tertiles, persons in the highest tertile (i.e. reporting most perceived stress) had less intuitive eating (p=0.007, p=0.019, respectively), more uncontrolled eating (p=0.001, p<0.001, respectively), and more emotional eating (p=0.001, p<0.001, respectively). Compared to the lowest PSS tertile, persons in the highest tertile of perceived stress reported also less cognitive restraint (p=0.024) and less eating competence (p=0.007). Intake of energy nutrients and Index of Diet Quality did not differ significantly among tertiles of perceived stress.

Conclusions:

Our results show that high perceived stress is associated with unfavorable features of eating behavior, such as eating less according to hunger and satiety cues and more according to emotions, but not with dietary factors measured by 48-h diet recall and Index of Diet Quality.

PO.104

Young & active - involving high school students in design of activities to promote physical activity, sense of community and enjoyment

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Many Danish high school students do not engage in physical activity besides the 90 minutes per week of compulsory physical education. Sports activities for this age group are often targeting elite athletes. The aim of this study was to involve students in development and implementation of diverse activities which promote physical activity, enjoyment and sense of community in high schools and the local surroundings. This participatory approach will engage students more actively in intervention research.

Methods: The activities will constitute one of the intervention components in the multi-component Healthy High School (HHS)-intervention. Development, implementation and evaluation of the HHS-intervention are guided by the Intervention Mapping protocol. Through workshops at all intervention schools university students in Sports and Health will facilitate collaboration between students, teachers and relevant local actors to develop and implement a broad range of activities. Participating students will be able to implement the workshop with future students and thereby secure sustainability. The format of the workshop will be developed in close collaboration with high school and university students, teachers and relevant organizations such as organizers of street sports or the Danish Society for Nature Conservation. A social platform will stimulate knowledge exchange across intervention schools.

The effect of the intervention component will be evaluated using a cluster randomized controlled design. Based on data from a nationwide high school cohort, 40 high-risk schools will be strategically selected and randomized into intervention- and control schools.

Baseline and follow-up surveys will be conducted at the beginning (age 16) and end of high school (age 19). The implementation process will be evaluated using mixed methods.

Anticipated effects: Positive changes in general well-being, school enjoyment, school connectedness, and physical activity levels.

Results: Pilot studies show that this user-driven process has the making of becoming an excellent tool for engaging youth in intervention design. High school students were creative and committed to the tasks they were given during the workshop.

Conclusions: We present a promising strategy for involving youth and their creativity and local knowledge in the design and implementation of high school-based interventions which are sustainable relevant and appealing to diverse types of students.

PO.105

Design and Baseline Characteristics of Participants in the TRIal of economic Incentives to Promote Physical Activity (TRIPPA): A Randomized Controlled Trial of a Six Month Pedometer Program with Financial Incentives

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SIG: Yes, Policies and environments

Awards:

Purpose: Non-communicable diseases (NCDs) are emerging as the predominant global health challenge of this century and physical inactivity is one of the primary risk factors for NCDs. Therefore, increasing physical activity levels is a public health imperative. The arrival of affordable wearable technologies, such as wireless pedometers, provides one strategy for encouraging walking. However, the effectiveness of these technologies in promoting sustained behavior change has not been established. Insights from economics suggest that incentives may be a useful strategy for increasing maintenance and effectiveness of behavior change interventions, including physical activity interventions that rely on wearable technologies. The aim of our randomized controlled trial (RCT) was to test the effectiveness of a common wireless pedometer with or without one of two types of incentives (cash or donations to charity) for reaching weekly physical activity goals. We present here the rationale, design and baseline characteristics of participants of this four arm randomized controlled trial.

Methods: Full-time employees aged 21 - 65 years were recruited from 15 different worksites across Singapore. Participants were randomly allocated to one of four groups - control, Fitbit Zip™ wireless activity tracker only, cash incentive + Fitbit, and charitable incentive + Fitbit. Those in the cash and charity incentive arms could earn cash or raise money for a charity by meeting weekly step targets. Participants in the control and Fitbit only arms received a nominal participation payment of SGD 4/week. The primary outcome measure was moderate to vigorous physical activity (MVPA) bouts/week measured via accelerometry.

Results: 800 full-time desk-bound office workers (on average 53 (sd: 37) employees at each worksite) were successfully randomized to one of four study arms. Mean age was 35 years, and 48.3% were male. The majority of participants (68.5%) were Chinese, 4.5% were Malay, and 13.1% were Indian. On average, participants spent 124.2 minutes in MVPA bouts/week, and walked 8,025 steps/day.

Conclusions: If shown to be effective, wearable technologies in conjunction with financial incentives may provide a scalable and affordable health promotion strategy for governments and employers seeking to increase the physical activity levels of their constituents.

PO.106

Objectively measured declines in MVPA are greater in boys than girls: systematic review and evidence appraisal

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SIG: Yes, Early care and education

Awards:

Purpose: The aim of this study was to systematically review accelerometer based longitudinal studies which have quantified year to year changes in moderate-to-vigorous physical activity (MVPA) among the general pediatric population in the absence of any intervention.

Methods: Longitudinal studies, cohort studies and randomized controlled trials were identified by searching Embase and Medline databases through Dec 2014. Keywords were structured to identify studies that used accelerometry to assess physical activity among children and adolescents (ages 2 to 18 years). To be eligible for inclusion, the studies must have reported MVPA (minutes/day) at least twice, after at least 1 year intervals following the baseline measures. We excluded studies which used subjective measures of MVPA, studies of clinical populations and populations in which an intervention was applied. A pooled mean at each age level was determined and wherever possible the data was extracted separately by gender. Percentage change from baseline or previous measurement was computed in order to account for the variety of accelerometer cutoffs used for defining MVPA across studies.

Results: After an initial search produced 218 hits, 200 studies qualified for abstract screening. Of these 51 studies emerged to be eligible for in-depth review of full text leading to exclusion of 33 studies, leaving 18 studies for analysis with a total sample of (n=11,069). Even though absolute MVPA among boys was higher when compared to girls, boys showed a greater percentage of decline per year (-10.3% 95% CI (-15.9 to -4.7)) compared to girls (-6.7%, 95% CI(-12.0 to -1.3)). The percentage decline in MVPA per year was highest at age 14, (-23% for boys and -17% for girls).

Conclusion: The present review suggests that, in contrast to expectations, age-related rate of declines in MVPA per year are greater in boys than girls. The relative decline in MVPA in both sexes is at its highest after around age 13-14 years and hence the review suggests that the early teenage years should receive special attention for maintenance of MVPA. There was limited data on MVPA trajectory for teenagers after age 15, or among younger children (<9 years).

PO.107

OncoActive+: a pre-experimental pilot to assess the feasibility, usability and appreciation of a systematically adapted, evidence-based physical activity intervention for prostate and colorectal cancer patients

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Despite positive effects of physical activity (PA) both during and after cancer treatment, most patients do not meet PA-guidelines. Moreover, patients report a need for PA information or easily accessible counseling. Therefore an evidence-based computer-tailored PA intervention for older adults was systematically adapted to the needs of prostate and colorectal cancer patients. We conducted a pre-experimental pilot to assess feasibility, usability and appreciation of the systematically adapted OncoActive+ intervention.

Methods: Twenty-one prostate and colorectal cancer patients were recruited in a 2 month pre-experimental pilot. Participants received 3 times tailored PA advice, a pedometer and access to a website with additional interactive content. Participants wore a waist-mounted Actigraph during 7 days, prior to the intervention, and completed a questionnaire on self-reported PA (SQUASH), PA determinants and health related outcomes at two time points. A final questionnaire assessed the feasibility, usability and appreciation of intervention elements and measurement methods. Spearman correlation between Actigraph and self-reported PA was calculated and changes in PA were assessed with paired sample T-tests. Additionally cancer professionals (N=11) reviewed the tailored advice for safety and feasibility.

Results: Analysis of the Actigraph data revealed that the average wear-time per day was 16.9 ±3 hours/day with 7 valid wear-days for all participants. Correlation between Actigraph and self-report PA was fair ($\rho = 0.52$). Participants regarded wearing the Actigraph and filling in the questionnaires as feasible (4.6 ± 0.5 and 3.9 ± 0.5 on a 1-5 scale). Participants increased their PA days from 4.1 to 5.4 ($p = .019$). The intervention components were regarded as usable ($3.6-4.6$ on 1-5 scale) and were appreciated well ($7.4-9.3$ on a 1-10 scale). The OncoActive+ intervention as a whole was highly appreciated ($8.6 \pm .924$ on a 1-10 scale). Cancer professionals reviewed the advice as safe and feasible.

Conclusion: PA measurement with an Actigraph in the target population was regarded highly feasible. According to the participants' appreciation it can be concluded that it is possible to successfully adapt an intervention developed for a general population to the specific needs of a new target group of cancer patients. Currently a randomized-controlled effectiveness trial is conducted.

PO.108

Association between patterns of active commuting with objective physical activity and physical fitness in fibromyalgia women: the al-Ándalus project.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Fibromyalgia patients present low functional capacity which limits their daily activities, deteriorates their quality of life and incurs considerable extra health care costs. Active commuting might represent a potential way of increasing physical activity and physical fitness levels, which are associated with better symptomatology in this population. The aim of this study was to examine the association of active commuting with physical activity and physical fitness in fibromyalgia women.

Methods: This cross-sectional study included 429 fibromyalgia women (52.2y) from Andalusia (southern Spain). Active commuting was assessed through a mode of commuting questionnaire. Physical Activity was measured with 7-day register accelerometry (GT3X). Fitness was measured with the Senior Physical Fitness Test. Pain threshold was measured with the tender points' examination according to the American College of Rheumatology Fibromyalgia criteria. The analyses were conducted separately in two age groups using the median age as cut-off point (young adults <52.8y, older adults ≥52.8y). One way analysis of covariance was performed to compare the differences between active and passive commuters across physical activity and physical fitness levels, controlling for age and pain threshold. We calculated the threshold values for physical activity levels and steps/day cut-points that better discriminate between being active vs. passive commuter, by using the Receiver Operating Characteristic (ROC) analysis.

Results/findings: In the young adults group, active commuters presented higher moderate, moderate-to-vigorous and total physical activity, number of steps, and cardiorespiratory fitness than passive commuters (all $p < 0.05$). In the older adults group, active and passive commuters did not differ in their Physical Activity and fitness levels. The area under the curve for moderate-to-vigorous and total physical activity levels, and number of steps was 0.62, 0.67 and 0.62, respectively (all, $p < 0.006$). The threshold values that better discriminate active vs. passive commuters were 108 min/day of moderate-to-vigorous, 240 min/day of total physical activity and 6549 steps/day.

Conclusion: In young adults with fibromyalgia, active commuters showed higher levels of physical activity and cardiorespiratory fitness than passive commuters. Future studies should investigate whether programs developed to increase active commuting truly enhance physical activity and cardiorespiratory fitness levels of fibromyalgia women.

PO.109

Equity Effects in Primary-Care based Physical Activity Interventions: a Scoping Review

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Little is known about equity effects in population level primary-care based physical activity interventions. This scoping review aimed to summarise the information that existing evaluations report on participant characteristics associated with social disadvantage and determine whether there is potential for assessing the equity effects of interventions across these characteristics.

Methods: Pubmed (MEDLINE), CINAHL, The Cochrane Library, EMBASE, BNI and PsycINFO were systematically searched in July 2014 for reports of randomised controlled trials (RCTs) recruiting adults from primary-care settings into interventions targeting physical activity, physical fitness or sedentary behaviour. Included studies were grouped and data extracted according to degree of information reported on distributional effects (interaction or sub-group analyses) across 'PROGRESS-Plus' characteristics (Place of residence, Race, Occupation, Gender, Religion, Education, Social capital, Socio-economic status, Age, Disability and Sexual orientation).

Results: The search yielded 7553 papers, of which 174 (reporting details of 149 individuals RCTs) were eligible for inclusion following title, abstract and full text screening. At least one PROGRESS-Plus characteristic was recorded in nearly all RCTs (N = 146), yet only 18 reported details of intervention distributional effects. Age (N = 13) and Gender (N = 17) were most frequently considered. Interaction or sub-group analyses were also available for Place of residence (N= 1), Race (N= 2), Education (N= 3), Social capital (N= 2), Socio-economic status (N= 3) and Disability (N= 1). No evaluations considered distributional effects across occupational categories. Religion and Sexual orientation were not recorded in any RCT. It was common practice for RCTs to exclude participants based on PROGRESS-Plus during recruitment thereby precluding study of the distributional effects of interventions across levels or categories of these characteristics.

Conclusion: Few primary care-based physical activity interventions report details of distributional effects. To further understand whether interventions are targeting the right populations and whether primary care-based interventions can help reduce inequities, further analysis is needed.

PO.110

Community participation in a health-promoting perspective – focusing on physical activity among senior citizens in the municipality of Kolding, Denmark

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SIG: Yes, Policies and environments

Awards:

Objective:

The aim of the research project was to generate knowledge about everyday physical activity among senior citizens in the municipality of Kolding From an evidence-based health-practice perspective the knowledge generated can be used to qualify future municipal policies and decision-making processes on moving in old age (Satterfield et al., 2009). Classic methods on citizen participation (Arnstein, 1969) constituted an important starting-point.

Methods:

Based on an arena approach, data was collected in three different community areas in the municipality of Kolding: Kolding, Christiansfeld, and Vester Nebel. Six focus group interviews were conducted with 34 65-74 year-old citizens. Data was processed and analysed via a thematic analysis to generate contextual knowledge about physical activity among seniors and their *active transportation, movement in the local area/community, and movement in their homes.*

Results:

This project generated knowledge about physiological, psychological, social, practical, and environmental factors that seniors highlight as being important to their everyday physical activity. These factors were subsequently divided into *facilitators* and *barriers*. We found that factors such as *being together, emotions* and *obligations* are primarily facilitating, whereas *safety, prioritisation* and *differences in functional abilities* tend to constrain physical activity. *Accessibility to e.g. cycle paths, green areas or scenic areas, health, facilities* and *information about local initiatives* can have both a facilitating and a hampering affect.

Conclusions:

Based on our findings, we concluded that citizen participation processes in three local areas in the municipality of Kolding have contributed with in-depth and contextual knowledge about everyday physical activity among senior citizens. A knowledge-base of this nature can be used in the qualification of future municipal decision-making processes related to the design, implementation, and evaluation of exercise and physical activity programs targeted at senior citizens with a wide range of functional ability.

References

Arnstein SR (1969): *A ladder of Community participation*. Journal of the American Institute of Planners, 35:4, 216-224

Satterfield JM, Spring B., Brownson RC., et al. (2009): *Toward a Transdisciplinary Model of Evidence-Based Practice*. The Milbank Quarterly, 87:2, s.368-390. University of California

PO.111

Maintaining the Olympics legacy: how sports clubs can help older people stay active and prevent obesity.

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SIG: Yes, Policies and environments

Awards:

Objective: The health benefits of physical activity and the health risks of obesity are well known. Older people are a population subgroup who could benefit most from increased participation in sport and physical activity and reduced levels of obesity. The objective of this study was to examine the effect of membership of sports clubs on promoting physical activity and reducing levels of obesity in older people.

Methods: We used data from waves 1 to 6 of the English Longitudinal Study of Ageing (ELSA). Survey items on sport and activity were reduced to a binary physical activity score for each wave (low activity vs moderate/vigorous activity more than once per week). Physical activity trajectory classes were identified using latent class growth analysis. Body Mass Index (BMI) was measured in waves 2, 4 and 6 and obesity was defined as BMI greater than 30kg/m². Relationships between sports club membership and levels of physical activity and obesity were examined using regression analyses.

Results: Using latent class growth analysis, ELSA participants could be divided into four latent classes according to their physical activity trajectories. These classes were labelled: a) 'persistently active'; b) 'improving'; c) 'declining' and; d) 'persistently inactive'. Increased frequency of sports club membership was associated with lower risk of being in a trajectory class other than the 'persistently active' physical activity trajectory, independent of age, sex, social class and health. Those who were a member of a sports club at all of the past survey waves had around two thirds the odds of being obese compared to those who never reported being a member of a sports club.

Conclusions: Sports clubs accessible to older people may improve health in this demographic by increasing activity levels and reducing obesity and associated comorbidities. There is a need for investment in these organisations to provide opportunities for older people to achieve the levels of physical activity necessary to prevent health problems associated with inactivity.

PO.112

Mothers' perceptions of the U.K. physical activity and sedentary behaviour guidelines for the early years (Start Active Stay Active): a qualitative study

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SIG: Yes, Policies and environments

Awards:

Objective: The UK developed guidelines for physical activity and sedentary behaviour in the early years for the first time in 2011. The UK guidelines state that children under 5 years, who can walk unaided, should be physically active for at least 180 minutes per day. This physical activity can be of any intensity (low to vigorous intensity) and spread throughout the day. The sedentary behaviour guidelines advise that for both children who can and cannot walk, extended periods of sedentary time should be minimised (except sleeping). As mothers have been identified as key influences on young children's physical activity and sedentary behaviours, it is important to understand their views towards these behaviours and whether they view the UK guidelines as realistic. To date, no study has examined mothers' perceptions of the guidelines for the early years. The aim of this study was to use in-depth interviews with mothers of preschool children to examine attitudes to the guidance and how dissemination of the guidelines could be maximised.

Methods: One-to-one, semi-structured interviews were carried out with 24 mothers of preschool children, recruited from 4 areas of varying socio-economic status within Bristol, UK. Data were analysed thematically using a framework approach.

Results: Mothers are not aware of the UK physical activity and sedentary behaviour guidelines for the early years. They believe that their child achieves the guideline targets for physical activity and sedentary behaviour and therefore they do not believe the guidelines are relevant to them. In addition, they think an increase in physical activity and a reduction in sedentary behaviour (especially screen-viewing) would cause pressure and stress for mothers and their child. Mothers found defining and quantifying physical activity and sedentary behaviour in their preschool child problematic.

Conclusions: Improved dissemination and promotion of the guidelines are necessary in order to raise mothers' awareness of them and create a need for behaviour change. Clear and pragmatic key messages need to be developed in order to make the guidelines accessible and usable.

PO.113

Gender differences in eating behavior of Austrian overweight and obese children and adolescents

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective:

The prevalence of childhood obesity has increased substantially in the last decade. Eating behavior has shown to be a critical lifestyle-related risk factor contributing to obesity and overweight. In order to address these problems in a long-term fashion it is particularly important to thoroughly study the eating behavior of children and adolescents. The aim of this research was to reveal gender differences in restrained eating. Restrained eating may be defined as a self-initiated attempt to restrict food intake for the purpose of weight control (1).

Methods:

The subjects (n= 260) aged 8-16 were recruited at the beginning of summer camps dealing with weight reduction (n=142; M=12.2 yrs; SD=1.8). The control group (n=118; M=12.2 yrs; SD=1.9) had normal weight and received no treatment. The German version of the "Three-Factor Eating Questionnaire" including 21 items on "cognitive control and restrained eating behavior" was carried out.

Results:

Regardless of weight categories no difference between sexes (t=-0.7; p>.5) or age groups (t=1.83; p>.5) in cognitive control and restrained eating behavior was observed. However, in both male (n=107) and female (n=153) subjects, a difference in restrained eating behavior related to body weight was noticed. In sum, overweight and obese boys (t=4.42; p<.5) and girls (t=7.39; p<.5) showed a higher level of cognitive control and restrained eating behavior than the respective normal weight control group.

Discussion:

Literature about research on eating behavior has identified several potentially relevant eating-related traits. Insights gained from our study provide a basis for developing age-specific treatments or programs for both male and female overweight and obese children and adolescents. In addition, findings allow for a comprehensive/unifying evaluation of both the existing public health and individual programs.

References:

(1) Is restrained eating a risk factor for weight gain in a general population? Lauzon-Guillain et al. 2006. Am J Clin Nutr. 83(1):132-138.

PO.114

Physical activity and self-reported health of Hungarian adults: observation survey and elaboration of an educational intervention

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: European Union countries recently reported that their populations' 43,3% to 87,8% are physically inactive. The worldwide adult population is just as inactive with ca. 50% obesity- and overweight rate. However, the beneficial effect of physical activity (PA) on health and chronic disease risks are well-known. The aim of our research was to map the Hungarian population's health, nutrition, PA and body composition. We determined different social groups based on demographic parameters to define the different educational intervention groups, with the overall goal to improve PA. Easy access to modern technology and industrialization has huge effect on PA and inactivity, and aiming to fight this negative effect we planned a 10-month educational intervention following the observational survey.

Methods: Research was carried out in 2014 in two Hungarian counties, Baranya and Zala. We developed a tablet-based survey including the IPAQ long questionnaire to examine PA, the Food Frequency Questionnaire to evaluate nutritional habits, and anthropometric questions (data were collected by body composition monitors). Statistical analyses was performed by SPSS v. 22, significance levels were set at p<0.05

Results: The sample size of adult participants was 1059 (F=53%), mean age was 48±17.54 years. 50.5% of respondents were obese or overweight (BMI-mean = 26.78%). 39.3% of respondents reported average health status. The psychosocial factors are also important regarding PA: 56.2% of women respondents were not doing any sports, while 43.8% of males were inactive. As for sports, women are active for 2.85 hours per week, while men do sports for 3.76 hours per week. We found that the BMI was negatively correlated with the PA level. However, healthy eating was more important in women's life than in men's.

Conclusion: The results of the observational research confirmed the need for a well-aimed intervention that we elaborated and that is currently being carried out. The 10 months home-based intervention consists of web-based (online and email) educational films and articles on the program's website, and educational films in the local media. After this period during the summer of 2015 we will examine the effect of the educational intervention.

PO.115

Environmental, psychological and physiological determinants of physical activity in people with type 2 diabetes

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Worldwide, over 312 million people have been diagnosed with type 2 Diabetes Mellitus (T2DM), resulting in high levels of health complications, disease-related deaths, and health care costs. Increasing physical activity (PA) is one way to improve T2DM prospects since it can improve glycaemic control, manage cardiovascular risk, and lead to weight loss. However, most people with T2DM do not meet the daily recommendations for PA. It is largely unclear as yet why these guidelines are only met by some, because most studies investigating insufficient PA among T2DM patients have focused either on environmental, psychological, or physiological determinants and demographic factors. This study used a theoretical framework based on a biopsychosocial and bio-ecological perspective, and addresses the aforementioned determinants and demographic factors as well as their interactions in T2DM.

Methods: We have analysed the baseline data of people with T2DM in the Maastricht Study, a population-based cohort study in the Netherlands. Physical activity was measured as hours of moderate-to-vigorous physical activity (MVPA) per week using the validated CHAMPS questionnaire. Demographics included age, gender and educational level. Environmental measures included data on participants' physical and social environment. Psychological measures included attitude towards PA, intrinsic motivation and personality characteristics. Physiological measures included physical impairments, anthropometric measures, and exercise tolerance.

Results: The study is currently in progress, however first analyses, performed in 792 participants with T2DM (mean age= 62.3; 67.3% male; mean BMI= 29.9; mean years since T2DM diagnosis= 8.3), revealed subjects had performed MVPA for an average of 4.3 (SD=4.0) hours per week. Linear regression analyses revealed that psychological factors explained 30.3% of variance in MVPA, while environmental and physiological determinants explained 4.2%, and 16.5%, respectively.

Conclusions: Preliminary results have demonstrated that psychological determinants seem to be more important for PA in people with T2DM than environmental or physiological determinants. This study will identify the determinants important to PA in T2DM and investigate their interactions in determining PA. As a result, this information may provide a better basis for interventions to stimulate and increase the amount of PA in people diagnosed with T2DM.

PO.116

QUALITY OF WEB-BASED CANCER-RELATED PHYSICAL ACTIVITY INFORMATION

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SIG: Yes, Cancer Prevention and Management

Awards:

Objective:

The Internet has become an invaluable and widely used tool for the public to gather health information. Therefore, it is essential to ensure information offered on the Internet is accurate. The study aimed to assess the quality of web-based cancer-related physical activity (PA) information appearing on reputable sites from Canada and other English speaking countries.

Methods:

A cross sectional Internet search was conducted on the following English speaking countries: Canada, USA, Australia, New Zealand, and the UK. Google was used to generate the top 50 results for each country when searching the keywords 'physical activity' AND 'cancer'. Top results for each country were assessed for quality of PA information presented based on a coding frame containing 22 indicators (e.g., PA defined). Additional searches were performed for Canadian-based sites to produce an exhaustive list.

Results:

The top 50 search results from the countries reviewed contained overlap, with 57.1% sites repeating on three or more countries' search results. Many sites offered cancer-related PA information (94.3%), but rarely defined PA (20.0%). Around two thirds (65.7%) of sites offered information for three or more cancer types, with breast being the most common cancer type mentioned. The top 50 results from each country did not differ on any indicator. When reviewing the exhaustive list of Canadian sites, many gave information about PA for survivorship (78.3%) and prevention (70.0%) but rarely defined PA (6.7%) or referenced guidelines (28.3%). Typically, Canadian sites did not differ based on authorship (i.e. charity/non-profit vs government/hospital), but it was found that charity sites offered more information about PA fundraisers ($p=.001$) and government sites more frequently mentioned nutrition ($p=.037$).

Conclusions:

Information about cancer-related PA is plentiful on the Internet but the quality of information needs improvement. Sites should do more than mention PA; they should give definitions and examples, along with guidelines. In addition, sites should provide behaviour change strategies to help the public further increase their PA. If higher quality sites were available, they could be useful tools for physicians to provide patient education leading to increases in PA, which would reduce cancer incidence and improve cancer survivorship.

PO.117

Families' Sustained Changes in Eating Behaviours following attendance of the 'Families for Health' intervention for the treatment of childhood obesity

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SIG: Yes, Children and families

Awards:

Purpose: Effective interventions which help children manage their weight should lead to adoption and maintenance of healthy behaviours. 'Families for Health' (FFH) is a 10-week community-based group intervention for overweight children (6-11 years) and their parents. It is designed to help parents develop their parenting skills to support lifestyle change within the family, particularly in relation to eating behaviours.

Methods: A multi-centre, randomised controlled trial to evaluate the effectiveness of 'FFH' in comparison to usual care. Parent and child one-to-one interviews were undertaken at 3-months and 12-months post randomisation. Interviews captured changes made to behaviours. Interviews at 12-months included whether changes were sustained. Interviews were digitally recorded and transcribed. NVivo software was used for data handling and coding. Coding was thematic, based on the interview schedule with addition of emergent themes. These findings relate specifically to sustained changes to eating behaviours among families who attended 'FFH'.

Results/findings: In total, 28 families who attended 'FFH' completed interviews at 3- and 12-months. Sustained changes commonly involved small adaptations, e.g. swapping white bread for wholemeal or drinking more water and less fizzy drinks. Understanding food labels was a key technique which families continued to apply when making food choices. Understanding portion sizes was also important and many families were able to implement smaller portions. Whilst initially challenging, these could be sustained. Reducing snacking was regularly mentioned at 3-months but appeared a difficult habit to maintain. Parenting aspects of 'FFH' had enabled some parents to give their child choices and get them involved in aspects such as shopping and cooking. Difficulties in sustaining behaviours were sometimes attributed to the reduced level of support once 'FFH' had ended.

Conclusions: Small changes to food types appeared most sustainable over time. Understanding food labels and portion sizes were key skills which families could implement and sustain over 12-months. Challenges arose in sustaining appropriate snacking behaviours. Offering continued support, such as regular follow-up sessions after the completion of 'FFH' may help families to sustain behaviours beyond 3-months.

PO.118

Determinants of gestational weight gain: review of the literature according to a conceptual model

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SIG: No, this does not fit in any of the special interest groups

Awards:

Few recent studies have examined the determinants of excessive gestational weight gain (GWG), with the exception of pre-pregnancy BMI. A recent review of the literature by Hill et al. suggested a conceptual model for psychosocial risk and prospective factors for excessive GWG that would account for several factors influencing GWG.

Purpose: To review studies on GWG determinants according to the conceptual model proposed by Hill et al., including maternal psychological, demographics, familial and cognitive factors as well as health behaviour change constructs and maternal behaviours.

Methods: PubMed database was searched using the following keywords: gestational or maternal weight gain with determinants and/or factors. Relevant references in the literature obtained were further reviewed to identify additional studies. Twenty studies published between October 2003 and September 2014 were included in the review.

Results/findings: None of these studies investigated all factors proposed in the model, and only 4 of them were theory-based (theory of planned behaviour, social cognitive theory of self-regulation, social economic framework and biopsychosocial model). The method used to obtain information on GWG determinants were mostly questionnaires (n=13), but semi-structured interviews (n=3), in-depth interviews (n=1) and focus group were also conducted (n=3). Six of the included studies demonstrated that a poor knowledge on GWG recommendations/consequences is associated with an increased risk of GWG. Low-income women and those with less education were also identified as being at increased risk of inadequate GWG by some authors. Three studies identified that clinical advices and support from health professionals also impacted on GWG. Some authors found that perinatal depression and an increase in emotional instability score were associated with an excess of GWG and that less satisfaction with bodyweight was also associated with increased GWG. Two studies demonstrated that self-efficacy towards healthy weight was protective on GWG. Motivation to change, initiate or maintain weight management behaviours during pregnancy was poorly investigated in those studies.

Conclusions: Maternal, psychological, demographic, familial, cognitive factors and body image during pregnancy as well as self-efficacy and motivation all impact on adopting healthy eating behaviour and physical activity to gain appropriate GWG. This should be investigated before designing intervention studies.

PO.119

Reliability of web-based implicit cognitions in response to health promotion campaigns

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SIG: Yes, e- & mHealth

Awards:

Purpose: Few evaluation studies of health promotion campaigns have considered implicit responses to campaign brands or messages. Such responses may include the automatic attention allocated to advertisements (i.e., attentional bias) or automatically activated associations between concepts (e.g., physical activity and health) that are generated when a message is viewed (i.e., implicit attitudes). The inclusion of implicit measurement is limited in part by experimental lab-based scenarios. Yet, such information is important for informing future health promotion efforts. Therefore, the purpose of this research was to test the reliability of web-based measures of implicit responses to physical activity promotion campaigns. Reliability was determined by testing if the web-based measures generated comparable results to the same tasks completed in a controlled laboratory setting.

Methods: Participants (N = 79) completed a Go/No Go task measuring implicit attitudes, a dot-probe task measuring attentional bias and questionnaire measures of instrumental and affective attitudes, awareness of the health promotion programs, and attention paid while doing the tasks. Participants completed the web (at a location of their choosing) or lab sessions one week apart. Session order (i.e., lab or web first) was randomly assigned.

Results: There were no significant differences ($p > .15$ for all tests) between data collected in the lab compared to the web for implicit attitudes (regardless of whether response time or sensitivity was used as the outcome), attentional bias, explicit instrumental and affective attitudes, or reported attention paid. It also did not matter which session (lab or web) was conducted first. Reliability of the implicit attitude measure was also tested with an odd/even split-half reliability. The reliability for response time was good (intra-class correlation range: .62 to .85) but not for sensitivity (intra-class correlation range: .22 to .51).

Conclusions: The web-based measurement tools are reliable for measuring implicit and explicit attitudes and attentional bias in relation to health promotion campaigns. It is recommended that response times rather than sensitivity be used to assess implicit attitudes. This research will contribute to evaluation of physical activity promotion campaigns.

PO.120

Prescription Education for School- and Community-Level Improvements in Knowledge and Behavior Choices Related to Fitness and Nutrition

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SIG: Yes, Early care and education

Awards:

Purpose: Integrated Science Education Outreach (InSciEd Out) partners with teachers and students, with a focus on underserved populations, to enhance hypothesis driven science and problem solving. Curriculum is cooperatively designed for empowering students to make healthier decisions, for this study called Prescription Education (PE). One critical focus for PE is fitness and nutrition (FN) due to the alarming increase in obesity within the last 30 years, particularly among marginalized populations.

Methods: The PE-FN curriculum intervention was performed with a nonrandomized cohort of more than 500 3rd/4th grade students in a multi-school setting. Surveys about behavioral choices in FN as well as Talking Drawings were administered pre/post implementation of the PE-FN curriculum. A novel quantitative and qualitative analysis was performed on the Talking Drawings on each school- and grade-level cohort, revealing not only student content knowledge, but also emergence of language indicative of early critical health literacy post PE-FN. 4th grade students from the cohort were able to apply their knowledge to motivate adult volunteers in a FN intervention for 16 consented adult participants in each community of this study. The value of student motivation was assessed through a questionnaire completed by the adult participants and through Body Mass Index assessments pre/post the six-week program. The latter study seeks to measure the influence of PE on community-level change beyond the classroom.

Results/findings: Initial metrics (from pilot year 2013-2014) demonstrate a positive shift in content knowledge and scientific capacity of students who complete PE-FN curriculum. Talking Drawing assessments displayed a cohort-level shift in post module responses with increased integration of activity and nutrition in student description of fitness. Statistical analysis of the student surveys and reporting of adult participant outcomes will follow the completion of the 2014-2015 PE-FN curriculum.

Conclusions: Together, these results suggest that curriculum based interventions with a science foundation can improve healthy behavior choices related to FN in both schools and the broader community that support a healthier lifestyle, including reducing rates of obesity. Future longitudinal studies will be needed to assess maintenance and longevity of behavior changes and knowledge in students and broader communities.

PO.121

Confidence for internet use to support exercise: Relationship to exercise intentions in Chronic Obstructive Pulmonary Disease patients

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The purpose of this study was to examine confidence for using electronic devices for health information and to support exercise in Chronic Obstructive Pulmonary Disease (COPD) patients following pulmonary rehabilitation (PR). After PR, adherence to recommended exercise is poor among COPD patients. It is possible that exercise adherence support and other health information might be provided through electronic devices and the internet. However, it is also possible that COPD patients are not sufficiently familiar and confident for using the internet, which could independently influence their exercise intentions.

Methods: 75 COPD patients (73 providing complete data) completed questionnaires assessing device ownership, subjective and descriptive norms for device use, instrumental and affective attitudes and confidence for using devices and the internet, along with subjective and descriptive norms for exercise, instrumental and affective attitudes and confidence for adhering to regular exercise. The levels of social cognitions for each behavior (internet/device use and exercise) were examined. Regressions were used to examine the relationships of the social cognitions regarding the two behaviours to intentions to exercise regularly.

Results/Findings: The overall confidence for internet use was moderate, at 3.26 SD 1.11 on a 7-point scale. Subjective and descriptive norms, and affective and instrumental attitudes were higher (>4.4 on the 7-point scale). Exercise cognitions were consistently higher than device/internet cognitions. Hierarchical regression analysis revealed independent contributions of internet/device cognitions and exercise cognitions on exercise intentions with significant associations with both attitudinal and confidence cognitions for both behaviours together accounting for 65% of the variance in intentions.

Conclusions: The results suggest that COPD patients are moderately inclined to use the internet/devices to support exercise, but confidence for using the internet/devices independently relates to exercise intentions over and above exercise cognitions. The results suggest that the internet/devices are a promising tool for supporting behavior change emanating from rehabilitation, but their use is a unique behavior that must also be supported through preparation and training.

PO.122

Initial findings of The REx Trial: a study of the feasibility of performing pre-habilitation in patients undergoing treatment for rectal cancer.

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Pre-habilitation in patients with cancer may initiate the improvements that have been found with rehabilitation: improved quality of life; less fatigue; reduced cancer recurrence and cancer specific mortality. However, the timing of pre-habilitation can be problematic as patients' treatment for cancer takes priority. Patients with locally advanced rectal cancer have 2 stages of treatment creating an opportunity for performing pre-habilitation, without any delay to the planned treatment. This trial aimed to perform a walking intervention (pre-habilitation) in patients with rectal cancer with the primary outcome to assess feasibility with physical and psychological outcomes as secondary aims.

Methods: Over a period of 2 years in Greater Glasgow and Clyde, we aim to recruit 80 patients with rectal cancer whose treatment plan will be chemo-radiotherapy (CRX; 5 weeks duration) followed by curative surgery (10-12 weeks after CRX completion). Participants will be randomised to either intervention or control groups: the intervention group will undergo a progressive individual pedometer guided walking intervention for 15-17 weeks that starts before their CRX and ends before their surgery, whilst the control group maintain their usual activity levels. Participants will undergo physical and psychological testing before CRX and before surgery.

Results: From August 2014-March 2015, a total of 37 patients were eligible of which 14 refused and 23 were recruited (62%). Reasons for refusal were: 'too busy' or 'too much else going on'. Of these 23, 1 patient dropped out of the trial because they defaulted from all treatment. Presently, 11 participants have completed the full trial (6 controls; 5 intervention).

Mean age of participants was 63 years (range 54-81) with majority being males (69%). 19% were smokers with 75% reporting alcohol consumption within normal limits. At baseline testing, participants were found to be active only 6% of the week, standing 18% and sitting/lying 76% of the time.

Conclusions: Performing pre-habilitation in patients with rectal cancer appears to be feasible with a reasonable recruitment rate and extremely low drop out rate. Completion of the trial will allow analysis of physical and psychological parameters to determine any potential benefits of pre-habilitation on patients with rectal cancer.

PO.123

A Canadian Report Card on Children's Food Environments and Nutrition

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SIG: Yes, Policies and environments

Awards:

Objective: The purpose of the Report Card was to assess how food environments and relevant policies in Canada support or inhibit children's dietary behaviours. Ongoing assessment can monitor progress in improving food environments for children's nutritional health through policy development and implementation.

Methods: Report card development was grounded in reviewed literature on food environment indicators. A conceptual framework organized indicators into 4 micro-environments (physical, communication, social and economic) and one macro-environment (political). An expert committee developed 42 indicators and corresponding benchmarks relevant to the Canadian context. A scoring scheme assigned a grade based upon 1) the degree to which the indicator was met, 2) whether or not supports are in place to assist with benchmark achievement, and 3) whether ongoing monitoring was in place or feasible to assess progress over time. We sought out sources of data (recent local research, government reports, websites etc.) to find data relevant to each indicator in two pilot provinces (Alberta and Quebec). Compiled data were used by expert reviewers to score each indicator independently. A meeting was held to debate and reach consensus on those indicators where agreement was not clear.

Results: Results varied by indicator. For example, in terms of physical environment, higher scores were awarded to cities following a mixed use planning scheme rather than urban sprawl, as we found higher accessibility to grocery and specialty stores (indicators of healthier products) in local neighbourhoods relative to access to fast food and convenience stores. Quebec's legislated ban on advertising to children scored highly in the communications environment. In both pilot sites significant resources have been invested in policies to support healthy school food environments, yet, neither met the benchmark of 75% of foods available in schools meeting "healthy" criteria. While policies may be in place, supports to implement those policies are insufficient for creating desired change.

Conclusions: Findings suggest that policy change to support children's food environments in Canada still requires significant investment. In addition, sites have unique strengths and weaknesses which can be opportunities for cross-jurisdictional learning for promoting policy change and implementation to support children's food environments and nutrition.

PO.124

Childcare services' adoption of obesity prevention policies and practices - a longitudinal study

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SIG: Yes, Policies and environments

Awards:

Purpose: Despite ongoing investments to improve the obesogenic environments of childcare settings, little is known regarding how these services have changed their physical activity and nutrition promoting practices. This study aims to describe changes in the proportion of Australian childcare services that have adopted best-practice healthy eating and physical activity practices between 2006 and 2013, and to assess whether adoption varied by socioeconomic status (SES) and locality.

Methods: A randomly selected sample of nominated supervisors (n=358) from childcare services located in New South Wales (NSW), Australia, participated in a telephone survey in 2006, 2009, 2010 and 2013. Supervisors reported on their service's adoption of six practices: 1) having written nutrition and physical activity policies, 2) staff trained in physical activity and nutrition in the past year, 3) scheduled time for fundamental movement skills and 4) outdoor play, 5) weekly or less screen time opportunities; and 6) serving only non-sweetened beverages.

Results: A significant increase in the prevalence of services adopting all but one practice, between 2006 and 2013 was identified. Ninety one percent of services adopted four or more practices, a significant increase from 38% in 2006. There were no differences in the proportion of services adopting each practice by locality and SES.

Conclusions: Government investment in obesity prevention programs can equitably improve childcare service's adoption of healthy eating and physical activity promoting practices on a jurisdiction-wide basis. The establishment of a routine system to monitor adoption of a broader range of practices by childcare services is warranted.

PO.125

Psychosocial correlates of current and future physical activity among Australian females in upper elementary and early secondary schoolJim Dollman¹, Kate Ridley²¹University of South Australia, Adelaide, Australia, ²Flinders University, Adelaide, Australia**SIG:** Yes, Motivational Dynamics**Awards:****Objectives:**

Steep declines in physical activity (PA) have been reported among children as they transition to adolescence, and adolescent females are at particular risk of low PA. Current PA correlate evidence is largely restricted to cross-sectional analyses. The aim was to examine correlates of current and future PA among females in upper elementary and early secondary school.

Methods:

Females (n=192; 38% response rate) in socioeconomically diverse South Australian schools were assessed at two time points (time1 and time2), 12 months apart on PA using the Physical Activity Questionnaire for Adolescents; PAQ-A) and hypothesized psychosocial correlates of PA. 103 girls started in the final year of elementary school ('transition' cohort) and 99 started in the first year of secondary school ('secondary' cohort). Change scores (Δ) were calculated for all variables. Three regression models were built: time1 correlates on time1PAQ-A (Model1); time1 correlates on Δ PAQ-A (Model2); and Δ correlates on Δ PAQ-A (Model3). Stratified analyses conducted where indicated by significant interactions.

Results:

In Model1, efficacy ($p<0.0001$), PA enjoyment ($p=0.04$), PA as priority ($p=0.004$), friend encourage ($p=0.001$) and father influence ($p=0.007$) explained 36.8% of total explained variance in PAQ-A. After stratifying, efficacy was a stronger correlate of PAQ-A in the transition ($p<0.0001$, $R^2=0.273$) than the secondary cohort ($p<0.0001$, $R^2=0.132$) while friend encourage was a stronger correlate in the secondary ($p<0.0001$, $R^2=0.274$) than the transition cohort ($p=0.31$, $R^2=0.0002$). In Model2, efficacy ($p=0.003$), friend encourage ($p<0.0001$) and father influence ($p=0.034$) explained 26.7% of total explained variance in Δ PAQ-A. After stratifying, friend encouragement was a stronger predictor of Δ PAQ-A in the secondary ($p<0.0001$, $R^2=0.315$) than transition ($p=0.12$, $R^2=0.01$) cohort. In Model3, Δ efficacy ($p=0.005$), Δ like PA ($p=0.008$), Δ friend encourage ($p=0.02$) and Δ friend play with ($p=0.001$) explained 37.3% of total explained variance in Δ PAQ-A. Δ friend encourage predicted Δ PAQ-A in the secondary ($p<0.0001$, $R^2=0.340$) but not the transition cohort ($p=0.54$, $R^2=0.003$).

Conclusion:

Fathers but not mothers influenced both current and future PA, while the influence of close friends through encouragement was stronger among older girls. Strategies to arrest the decline in PA among pre- and early adolescent girls should capitalize on the powerful influences of fathers and friends.

PO.126

Older adults' experiences with wearable physical activity trackersSiobhan McMahon, J. Michael Oakes, Beth Lewis, Weihua Guan, Ifrah Biyoow, Jean F. Wyman, Alexander Rothman
University of Minnesota, Minneapolis, Minnesota, USA**SIG:** Yes, Motivational Dynamics**Awards:**

Objective: Older adults are interested in using wearable technology to track their physical activity (PA), yet they rarely use it. One reason might be that most design and marketing strategies for wearables target younger populations. Thus, we gave Fitbit Ones to older adults and requested they use them each day. The aim of this study is to report on the experiences of older adults using wearable PA trackers.

Methods: Eighty-nine participants in a randomized controlled trial assessing the motivational components in a fall-reducing PA intervention completed a survey of wearable technology. All received Fitbit Ones pre-intervention. The survey, administered one-week post-intervention, contained 10 items addressing (a) learnability, (b) utility, and (c) motivational support of wearable technology used in this study. Response scales ranged from 1 (strongly disagree) to 5 (strongly agree). Analysis included descriptive statistics. Differences in ratings by age, gender and education were assessed using appropriate parametric (e.g., independent t) and non-parametric (e.g., Kruskal-Wallis) tests.

Results: Participants were predominantly White (76%), women (73%) with a mean age of 79 (SD = 7) and at least some college education (69%). Few used smartphones (9%), computers (33%) or had experience with wearable PA trackers (1%). Participants agreed or strongly agreed that (a) learning to use the Fitbit One was easy (88%) and would be easy for other people, like them (96%); (b) they look at their Fitbit One at least once per day (93%) and they will continue to use it to track their PA (91%), and (c) the information on their Fitbit One display is useful as they make daily decisions about PA (69%) and enhances their motivation for PA (80%). Women and men, as well as participants with different education levels, rated each item similarly. Participants aged > 80 years rated all items lower than participants between the ages of 70-80 ($p < .05$).

Conclusions: Older adults can use off-the-shelf wearable technology, and many find that it is beneficial and supports their motivation for PA. It will be important for clinicians, researchers, and retailers to not overlook this technology when supporting older adults' engagement in PA.

PO.127

Dietary behavior and physical activity modifies the association between melanocortin 4 receptor gene variants and obesity in Chinese children

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The association between *MC4R* variants and obesity was reported to be modulated by sedentary behavior and physical activity. But the interaction was not replicated by several studies. Whether the inconsistent results were due to specific gene and environments interaction need further investigation. We performed the study to clarify the association of variants within and near *MC4R* gene with obesity and gene-environmental interactions in Chinese children.

Methods: Two common variants (rs12970134 and rs17782313) near *MC4R* were genotyped in Chinese children. Associations between the variants and obesity-related phenotypes and gene-environmental interaction were analyzed.

Results: The risk alleles of rs12970134 were nominally associated with overweight/obesity (Odds Ratios (OR)=1.20, 95%CI: 1.02-1.42) or BMI ($\beta=0.31$ kg/m², 95%CI: 0.01-0.61). We found both rs12970134 and rs17782313 was associated with risk of overweight/obesity (OR=1.34, 95%CI: 1.02-1.76, and OR=1.36, 95%CI: 1.04-1.77) only in subjects with high calorie foods consumption. The *P*-value of interaction between polymorphism and high calorie foods consumption was 0.055 and 0.035, respectively. We also found the significant interaction of rs12970134 and sedentary behaviors on BMI ($P_{interaction}=0.039$).

Conclusion: We found the *MC4R* rs12970134 polymorphism was associated with overweight/obesity or BMI. The dietary behavior or sedentary behavior can modify the association between the *MC4R* variants and obesity in Chinese children. The study results help to clarify the etiology of human obesity.

PO.128

The effects of school-based physical activity interventions on students' health-related fitness knowledge: A systematic review

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Research about Physical Literacy shows that the transportation of knowledge is one essential task of physical education. This holds particularly true regarding health promotion and illness prevention. We conducted a systematic review that fills the existing research gap concerning the impact of school-based physical activity interventions on students' health-related fitness knowledge. The study design, methodological quality, the effectiveness of interventions on students' health-related fitness knowledge, and the association between a change in knowledge and behaviour were analysed.

Methods:

A literature search was carried out in May 2014 in electronic databases and included studies that carried out a physical activity intervention programme in the school setting and examined students' health-related fitness knowledge. The study involved controlled trials with a comparison between intervention and control group. We considered only published articles written in English.

Results/findings:

This systematic review includes 34 studies. The majority of the studies (79.4%) revealed significant positive intervention effects on students' health-related fitness knowledge. Studies examining adolescents were more frequently in a position to influence students' health-related fitness knowledge (87.5%) than studies examining children (75%), and studies with low methodological quality (88.8%) showed more frequent positive effects than studies with moderate quality (75%). The effects on students' health-related fitness knowledge were independent of moderator variables such as the intervention content, duration, and frequency. In the descriptive analysis of a possible association of the intervention effects on students' health-related fitness knowledge and on students' physical activity and/or fitness levels, we found that only few studies showed a positive influence on both variables at the same time. The intervention programmes more frequently changed students' health-related fitness knowledge in comparison to a change of physical activity or fitness levels.

Conclusions:

The analysed programmes can positively influence students' health-related fitness knowledge, but the practical significance of these changes remains unclear. Further research is needed to clarify the influence of students' health-related fitness knowledge on reflection, understanding, physical activity behaviour, and overall physical literacy levels.

PO.129

Using Intervention Mapping to develop a multicomponent intervention programme for different target groups in an all-day school framework

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Technische Universität München, Munich, Germany

SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Physical activity, media use and diet quality are key behavioural determinants of health, but only few adolescents behave in a health-enhancing way. Thus, health-promotion programmes are important, but only few studies present a clear documentation of the development process and content of their interventions. Thus, it is often not possible to understand why interventions succeed or fail. Our aim is to describe the development and design of EWA-Healthy (Eat, Watch, and Act Healthy), a multicomponent intervention for different target groups in the school setting.

Methods:

Intervention Mapping protocol was used to model the design of EWA-Healthy. A *needs assessment* based on a literature review was carried out. As a next step, findings resulted in two *matrices of change objectives* (for two subgroups). Suitable *theoretical methods and practical strategies* were discovered to design tailored interventions.

Results/findings:

We revealed that (1) health behaviours of lower secondary school children are particularly health-compromising and only few studies address this problem; (2) programmes addressing different behaviours simultaneously, (3) programmes implemented in a full-day school setting, and (4) programmes tailored to the needs of different behaviour pattern groups seem to be promising. Key programme outcomes were defined: increase physical activity, reduce media use, and increase diet quality in 6th graders of lower secondary schools. Finally, based on preliminary research as well as feedback from schoolteachers and research experts, the development process resulted in the design of two intervention programmes, which should be implemented over half a school year: a) for students with a high-risk profile (low physical activity levels, high media use and low diet quality), and b) for students with a low- to medium-risk profile.

Conclusions:

The Intervention Mapping protocol helped developing a theory-based and well-structured intervention study aimed at enhancing students' health behaviour. This systematic approach provides a clear framework and increases the potential of the intervention to positively influence physical activity, media use, and dietary behaviour of target groups which are most in need.

PO.130

Moderate to vigorous physical activity among 12-15 years old Czech adolescents living in a different types of built environment.

Jan Dygryn, Josef Mitas, Lukas Rubin, Michal Vorlicek, Karel Fromel
Faculty of Physical Culture, Palacky University, Olomouc, Czech Republic

SIG: No, this does not fit in any of the special interest groups

Awards:

Objective:

The purpose of this study was to compare objectively measured moderate-to-vigorous physical activity (MVPA) across the traditional neighborhood development (TND), prefabricated blocks of flats and new suburban areas in a sample of Czech adolescents.

Methods:

In spring 2014, MVPA data were collected on 5 days (including 1 weekend day) from 94 adolescents (age = 13.6 ± 1.1 years; 51% girls) living in Olomouc. PA was measured using the accelerometer ActiGraph. A binary logistic regression was used to model the probability of accumulate at least 60 minutes MVPA/day among TND, prefabricated blocks of flats and new suburban adolescents.

Results/findings:

Boys and girls accumulated 50.7 ± 23.5 min of MVPA/day. Adolescents living in TND ($60.1 \text{ min} \pm 27.0$ of MVPA/day) were 6.1 more likely ($p \leq 0.01$) to accumulate at least 60 minutes of MVPA/day compared with new suburban areas ($39.9 \text{ min} \pm 16.7$ of MVPA/day) adolescents.

Conclusions:

The TND appears to be supportive for MVPA in Czech adolescents. The types of built environment is an important correlate of MVPA in adolescent living in Czech Republic regional towns.

PO.131

Total sitting time and the risk of incident diabetes in Danish adults [the DANHES cohort]

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

To test the hypothesis that total sitting time is associated with incident diabetes, after adjustment for physical activity and obesity.

Methods:

In DANHES (The Danish Health Examination Survey) conducted in 2007/2008 we examined total sitting time among 72,608 men and women aged 18-85 years without diabetes at baseline. Participants were followed for incidence of diabetes in the Danish National Diabetes Register to 2013 (data from the National Patient Register, Health Insurance Service Registry, and Register of Medicinal Product Statistics). Cox regression analyses were performed with adjustment for several confounders and using multiple imputations for missing values.

Results:

During a mean follow-up of 4.9 years, 1790 developed diabetes (IR=508/100,000 years). Among obese participants there was a clear dose response relationship between sitting time and diabetes, while no increased risk was observed among those with normal weight ($p=0.05$ for interaction). Among inactive participants the risk of diabetes increased by increasing sitting time, while there was no increase in risk among those who were physically active ($p=0.31$ for interaction).

Conclusions:

Results suggest that the effects of total sitting on incident diabetes are attenuated by physical activity and obesity, and that total sitting remains a risk factor for diabetes only in inactive and obese populations.

PO.132

PARENTING PRACTICES AND MOTHERS BEHAVIOURAL AND DEMOGRAPHIC FACTORS INFLUENCING THEIR 2 YEAR OLD CHILD'S PHYSICAL ACTIVITY

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SIG: Yes, Early care and education

Awards:

Introduction: Evidence suggests that early life factors are important in developing and shaping physical activity (PA) behaviour. Mothers have a crucial role in their children's PA in the early years of life. Identifying maternal factors associated with PA during the early years is a necessary first step to develop effective interventions. Using the Born in Bradford 1000 (BiB1000) data, a nested cohort of the Born in Bradford prospective birth cohort, we aimed to identify maternal factors that influence PA and sedentary behaviour in 2 year old children.

Methods: 1214 participants (mother and child) were examined when the child was approximately 2 years of age from the BiB longitudinal multi-ethnic birth cohort study. The outcome variable (children meeting guidelines of 180 minutes of total physical activity (TPA)) was measured using the Early Years Physical Activity Questionnaire (EY-PAQ). Numerous predictor variables across the socio-ecological model were measured. Pearson Chi-square tests were conducted to test the level of difference between the different variables. Variables with a significant difference were further analysed by hierarchical multivariate logistic regression models. Sex, age and ethnicity were controlled for and the odds ratio (OR) and 95% confidence interval (CI) were calculated.

Results: 651 (78%) children met PA guidelines; 178 (22%) did not. Multivariate logistic regression models found associations across maternal behaviours, maternal rules/beliefs and environmental variables. Positive associations were found for <1hour maternal TV/ DVD (OR 2.51, 95%CI 1.04-6.05), mother being sedentary (IPAQ) (OR 1.72, 95%CI 1.00-2.98), encouragement to play active games 5-6 times a week (OR 1.57, 95%CI 0.94-2.64)/everyday (OR 2.59, 95%CI 0.96-7.01), limiting playing outside everyday (OR 0.87, 95% CI 1.35-4.25). Negative associations were found for how often children played in the garden/yard (2-4 times (OR 0.34, 95%CI 0.17-0.65), 5-6 times (OR 0.27, 95%CI 0.13-0.58) and everyday (OR 0.28, 95% CI 0.15-0.54)).

Conclusion:

Variables across the socio-ecological model were associated with meeting PA guidelines; supporting PA is a multi-domain complex behaviour. Compared to previous research, contradictory findings were found. Children were more active when mothers were sedentary and when they spent less time outside in the garden/yard. Future research within this unique bi-ethnic population is required.

PO.133

Ability of different indicators of obesity in identifying adverse levels of inflammatory and metabolic markers in adolescents

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Research Centre for Physical Activity, Health and Leisure (CIAFEL) - FADE-UP, Porto, Portugal

SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Overweight and obesity are associated with adverse levels of inflammatory and metabolic markers. We aimed to evaluate the ability of different measures of overall and abdominal adiposity in identifying adverse levels of some inflammatory and metabolic markers in a sample of Portuguese adolescents.

Methods: A cross-sectional school-based study was conducted on 529 Portuguese adolescents (267 girls, 262 boys) with a mean age of 14.3±1.7 years old. Weight, height, sitting height and waist circumference (WC) were measured according to standardized procedures, and body fat percentage (BF%) was measured by bioelectric impedance. Body mass index (BMI), waist-to-height ratio (WHtR) and waist-to-sitting-height ratio (WsHtR) were calculated. Intravenous blood samples were taken to determine the biomarkers C-reactive protein (CRP), fibrinogen, erythrocyte sedimentation rate (ESR), complement C3 and C4, leptin and adiponectin. Receiver operating characteristic (ROC) curves were used to analyse the potential ability of the different measures of adiposity to discriminate between low and high values of biomarkers.

Results/findings: BF% presented the highest areas under the curve (AUC) for: fibrinogen, for girls (AUC=0.660) and boys (AUC=0.613); complement C3, for girls (AUC=0.720) and boys (AUC=0.689); and ESR (AUC=0.625), complement C4 (AUC=0.677) and adiponectin (AUC=0.672), but only for girls. BMI presented the highest AUC for CRP (AUC=0.754) in girls, and leptin for girls (AUC=0.913) and boys (AUC=0.929).

WHtR presented the highest areas under the curve (AUC) for leptin, in girls (AUC=0.880) and boys (AUC=0.911); and for CRP (AUC=0.757), fibrinogen (AUC=0.666) and adiponectin (AUC=0.700), but only for girls.

WC presented the highest AUC for CRP (AUC=0.630), fibrinogen (AUC=0.629) and complement C3 (AUC=0.693), but only for boys; and for complement C4 (AUC=0.634), in girls. WsHtR presented the highest AUC for complement C3 (AUC=0.710), in girls. $p < 0.05$ for all.

Conclusion: Analyses of the ROC curves permitted to conclude that, in our sample, the indicators of obesity that more often presented the highest AUC, and consequently the best discriminatory power in identifying adverse levels of the analysed biomarkers, were, for overall adiposity, BF% for both genders, and in relation to abdominal adiposity, WHtR in girls, and WC in boys.

PO.134

The impact of antenatal food safety advice on dietary behaviour during pregnancy

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SIG: Yes, Children and families

Awards:

Purpose:

Pregnancy is a key time to engage with women to drive positive behaviour change as women are motivated to improve the health of themselves and their baby. Food safety advice is routinely provided during the antenatal period to reduce the risk of maternal and foetal complications. However, women find the advice given during pregnancy confusing (Wennburg *et al.*, 2013), and this is of particular concern for nutritionally vulnerable groups, such as pregnant teenagers. The purpose of this research was to explore the changes that teenagers make to their diet as a result of antenatal guidance on food safety.

Methods:

Content analysis was used to explore qualitative data from 55 semi-structured interviews with pregnant teenagers (16-19 years) and health care professionals (HCP - midwives, family nurses and obstetricians).

Results/Findings:

Teenagers often misunderstood messages because they felt they were irrelevant, they did not have sufficient time to seek clarification from their HCP or they had conflicting advice from others. This led to potentially useful and cheap sources of nutrients, such as cheese and tuna, being avoided altogether, rather than specific high-risk food items.

Not relevant

I'll say do you know the foods to avoid... "I don't eat that" some of them do kind of switch off. [Midwife]

Avoidance

Now I don't know what soft cheese I can eat and what I can't eat, so I just avoid the whole of it [Teenager]

Dietary quality

They're cutting out a lot of things in their diet that they can have that are good for them [Family Nurse]

Misinformation

They get misinformation from friends or family... They're one of the biggest hurdles... "but my mum said", or "my nan said" [Midwife]

Table 01: Examples of quotes from transcripts

Conclusions:

This provides a unique insight into how food safety messages may unintentionally drive dietary changes which potentially compromise nutrient intakes. Further research is needed to explore ways in which HCPs can best support appropriate behaviour change, particularly in nutritionally vulnerable groups. This support should consist of relevant, consistent and reinforced food safety and nutrition messages, which teenagers are able to engage with.

PO.135

Perceiving others as intrinsically or extrinsically motivated: Effects on exercise intention and approach-avoidance tendencies in breast cancer patients.

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Numerous studies suggest that narratives are effective messages to favorably modify health behaviors. However, no study has verified whether the motivational effects of narratives can come from motivational contagion, which refers to the idea that the motivational state of a person could be the reflection of others' motivation. The purpose of this study was to examine this hypothesis in the context of physical activity in breast cancer patients.

Methods: A total of 89 insufficiently active breast cancer patients ($Mage = 50.1 \pm 10.3$ years) were randomly assigned to watch a video featuring a breast cancer survivor, physically active and intrinsically motivated (IM group), or a video featuring the same woman, physically active but extrinsically motivated (EM group). After watching the video, participants filled out questionnaires measuring exercise self-efficacy, exercise intention and physical activity level. A subsample also completed a *Manikin Task* to assess their impulsive approach tendencies toward physical activity and sedentary behaviors. Analyses of covariance, including the physical activity level as a covariate, were computed for group mean comparisons.

Results: The IM group reported higher scores of exercise self-efficacy, $F(1,62) = 9.98, p < .01, \eta^2 = .139$, and exercise intention, $F(1,62) = 4.08, p < .05, \eta^2 = .062$, than the EM group. The subsample analyses indicated that impulsive approach tendencies toward sedentary behaviors were lower in the IM group than the EM group, $F(1, 27) = 8.08, p < .01, \eta^2 = .230$.

Conclusions: Compared to an extrinsically motivated narrative source, an intrinsically motivated narrative source appears to be more effective in enhancing self-efficacy beliefs and exercise intention in insufficiently active breast cancer patients. Our results also suggest that the manipulation was effective at the implicit level. This dual action of motivational contagion at an implicit and explicit level may be explained by the fact that motivational contagion both acts to help people generate conscious expectations on physical activity and acts as a priming influence. Since implicit and explicit processes have a complementary role on the prevision of behaviors, this intervention has a promising role to help cancer patients to engage in physical activity.

PO.136

What Resources Do Child Care Providers Need in Order to Follow Through with Children's Wellness Recommendations?

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²University of Colorado Denver, Denver, Colorado, USA

SIG: Yes, Early care and education

Awards:

Let's Move Child Care Checklist promotes an evidence-based set of recommended wellness practices for child care settings. Little is known about child care providers' resource needs for implementing these best practices in their settings. At a child care providers' continuing education event, we advertised free support to caregivers interested in furthering implementing the Let's Move Child Care Checklist policy practices. A total of 11% of caregivers attending the educational event expressed interest. Twenty-five child care facilities received follow-up support for Let's Move checklist items. Caregivers were able to choose which types of support they wanted, as long as their resource request could be tied to the Let's Move Checklist recommendations. Caregivers made resource requests in the following categories: staff development training (80%); environment change-physical activity (52%); environment change-nutrition (40%); children's activities (20%); parent outreach (8%); menu change support (8%); and written policy change support (8%). Follow-up interviews suggested that caregiver and child behavior changes were more easily observed following environmental and menu changes compared to staff development, parent outreach, or children's activities. The two child care organizations initially interested in policy change both declined to print and distribute revised policies in their parent and teacher handbooks. In conclusion, while more research is needed, results of this study point to challenges and promising avenues for supporting caregivers' implementation of the Let's Move Child Care practices.

PO.137

What are the behaviour change techniques used in interventions with the potential to reduce sedentary time? Findings from a systematic review.

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Physical Activity for Health Research Centre, Institute for Sport, Physical Education and Health Sciences, University of Edinburgh, Edinburgh, UK

SIG: Yes, Motivational Dynamics

Awards:

Purpose: Emerging evidence suggests that sedentary behaviour (SB) can be successfully reduced following individual level interventions¹. This study aimed to identify the specific behaviour change techniques (BCT) present in interventions with the potential to reduce sedentary behaviour in adults.

Methods: Using a 93-item hierarchically clustered taxonomy of techniques², we extracted BCTs from 43 studies identified during a systematic review that evaluated the effect of interventions that included SB as an outcome measure¹. Intervention types were categorized as SB only (n=3), physical activity (PA) only (n=17), PA and SB (n=5), or lifestyle (PA/SB and diet; n=18). We further categorized studies into those indicating a beneficial effect on sedentary behaviour in favour of the intervention group (i.e., a statistically significant reduction) (n=13) and those indicating no beneficial effect (n=29). BCTs from each study was independently extracted and coded by at least two of five reviewers.

Results: The average number of techniques used in the intervention groups across studies was 8.9 (±3.6). The most common techniques were 'instruction on how to perform a behaviour' (n=31), 'goal setting of behaviour' (n=30) and 'self-monitoring of behaviour' (n=27). The average number of BCTs used was 4.0 in SB only, 9.1 in PA only, 7.8 in PA and SB, and 8.2 in lifestyle studies. There was no statistically significant differences in the number of BCTs used by intervention type (F=1.76, df=3, p=0.17). There was no significant difference in the average number of BCTs reported in effective versus non-effective studies (8.9 in effective versus 7.9 in non-effective studies). There is likely to be under-reporting of techniques due to insufficient reporting of intervention detail.

Conclusions: To inform future intervention design, ongoing research will explore the specific BCTs used and the combination of BCTs which resulted in successful behavior change.

¹ Martin A, et al. Interventions with potential to reduce sedentary time in adults - systematic review and meta-analysis. British Journal of Sports Medicine. In press

² Michie S, et al. The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. Annals of behavioral medicine 46.1 (2013): 81-95.

PO.138

Glasgow Commonwealth Games: what works when assessing the impact of a large sporting event on the general population, lesson learned from the GoWell East study.

Claire Cleland, Sally Stewart, Elaine Hindle, Julie Clark, Anne Ellaway, Ade Kearns
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SIG: Yes, Policies and environments

Awards:

Purpose:

We recently completed the second wave of the GoWell East household survey, a study designed to assess the impact of the Commonwealth Games (CWG) on the health (including physical activity) and life chances of adults living near the site of the CWG. We now wish to perform an in-depth assessment of the study processes and lessons learned from wave two; with the main research question being "how effective is the implementation of a community survey when aiming to determine the impact of a large sporting event on the local population?" This is a novel and timely opportunity to reflect on the methodological techniques used, thereby informing future attempts to evaluate the impact of large sporting events.

Methods:

We will use a mixed method approach to assess if the study achieved what it set out to do (i) we will compare the characteristics of the achieved sample with census data to help to determine representativeness, and we will review attrition, recruitment and response rates; and (ii) we will conduct a qualitative review of the 'lessons learned' by both the research and fieldworker team, focusing on study design and the logistics involved in conducting a study involving a hard to reach population in deprived neighbourhoods.

Results/findings:

The research team will report novel findings, including quantitative and qualitative findings; proposed study modifications; rationale for modifications; and recommendations for research and practice.

Conclusions:

Justification for the large spend on major sporting events often includes the claim that the health and life chances of local residents will benefit. However, the evidence to date to support such claims is weak, which may be due in part to the study design used. We aim to offer a novel and timely opportunity to report 'lessons learned' to inform future studies elsewhere attempting to review the effectiveness of large sporting events.

PO.139

Changes in television viewing, computer use and walk to school among elementary school-aged children in Portugal from 2002 to 2009

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University of Coimbra, Coimbra, Portugal

SIG: Yes, Socioeconomic inequalities

Awards:

Objective: To describe changes from 2002 to 2009 in television time, computer use and walk to school in Portuguese schoolchildren, aged 7-9 years old

Methods: A cross-sectional study was carried out in 2002 and 4511 children were observed. The same schools were visited again in 2009 and 8300 children were observed. A questionnaire was fill out be parents concerning family characteristics as well child's behaviors such as television time, computer use and way to school, walking or by car.

Results: Concerning television viewing time, in 2002 15.2% of children spent more than 2 hours and in 2009 was 27.5%; computer time changed from 0.6%, more than 2h in 2002, to 2.9% in 2009. In 2002 32.4% of the children walked to school and 52.6% use the care and in 2009 were 24.0% and 59.2% respectively.

Conclusions: Portuguese children increased television time, computer use and decreased the percentage of children who walk to school. This changes in sedentary behaviors require attention doing their negative impact in child health status.

PO.140

The Motorcycle is like our feet - Sociocultural, economic and environmental determinants of physical activity in the mobility behaviour of urban Indonesias: a qualitative cross-sectional study

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SIG: Yes, Motivational Dynamics

Awards:

The burden of physical inactivity, obesity and related health outcomes is rising in Indonesia. However, most studies on physical activity environments are from high-income-countries, showing inconsistent results. Therefore, this study explores socio-cultural, economic and environmental determinants of the everyday mobility behavior of middle-class city dwellers in Yogyakarta, Indonesia.

A qualitative mixed-method approach was used. Qualitative content analysis of key-question based interviews (average 40 min) with studying (n=2) and working (n=5) middle-class city dwellers was performed. After a 70min focus-group discussion (FGD) with a local NGO, promoting walking and cycling, a questionnaire was created and handed out to 40 Students (response rate: 38/40) and 25 middle-class households (response rate: 19/25). In another FGD (55min), the final results were discussed with the NGO.

Study participants associate cycling and walking as means of everyday mobility with negative attributes such as being poor and having no alternatives, and perceive it as unusual. By contrast, motorcycle usage is associated with positive attributes (i.a. success, wealth and being dynamic) and considered as normal behavior. A beauty ideal of light skin is perceived as limiting outdoor physical activity. Motorcycling is described by participants as the fastest and most effective means of urban transport i.a. due to subsidized petrol prices the usage is considered cheap. Moreover, informal sector business models, allow for easy, safe and cheap parking. By contrast, health and environmental benefits of physical activity are described as not important enough to outweigh the motorcycles' advantages. Therefore no reason is seen not to use a motorcycle; , while owning one is considered a necessity. Participants perceive the built environment as excellent for motorcycles, whereas its evaluation for cyclists and pedestrians is inconsistent. Especially people with low walking and cycling mobility consider it as supportive and it is rarely described as a barrier for cycling and walking.

The results of our study highlight the relevance of sociocultural determinants of physical activity in everyday mobility behavior in an urban middle-income country setting. Interventions to promote physical activity in such settings should therefore not focus solely on changing the built environment, but on sociocultural factors as well.

PO.141

Exercise buddy as a driver for motivation?! What are the effects of a custom designed exercise program on motivation and enjoyment to be physically active in children with obesity

Sofie Moresi¹, Mark Janssen^{1,2}, Nadine Chudy¹, Steven Vos^{1,3}, Vivian Backerra¹

¹Fontys University of Applied Sciences, School of Sport Studies, Eindhoven, The Netherlands, ²Eindhoven University of Technology, Department of Industrial Design, Eindhoven, The Netherlands, ³University of Leuven, Policy in Sports & Physical Activity Research Group, Leuven, Belgium

SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Maastricht Sport (Department of Sports of the Municipality of Maastricht) initiated a collaboration with COACH (Centre for Overweight Adolescent and Children's Healthcare of Maastricht University Medical Centre) and the Physical Activity Centre, School of Sport Studies (Fontys University of Applied Sciences) to develop a custom designed exercise program for children with obesity. The goal of this program was to increase children's motivation and enjoyment to be physically active. This study aimed to gain insight into the effectiveness of this program.

Methods:

The exercise program lasted for 10 weeks (n=23, age ranged from 7 to 15 years old). Relevant aspects of the program were a personal exercise buddy, all buddy activities were carried out in one group, and activity preferences of the children were considered in developing the activities. Data was collected with a questionnaire (Bogaards, Thijs, Sleddens & Kremers, under review), based on the Self Determination Theory and its continuum of motivation (Hagger & Chatzisarantis, 2007). This questionnaire measured on a 4 point likert scale (1) enjoyment in physical activity (a Dutch translation of the Physical Activity Enjoyment Scale (PACES) and (2) motivation in physical activity (based on the Behavioral Regulation of Physical Activity in Children (BRPAC).

Results:

Results showed no significant change in enjoyment in physical activity over 10 weeks ($M_0 = 3.38 \pm 0.31$, $M_1 = 3.39 \pm 0.44$). While motivation in physical activity shifted towards more autonomic forms of motivation. The external regulated motivation (non-autonomous) decreased significantly ($M_0 = 1.90 \pm 0.50$ to $M_1 = 1.32 \pm 0.51$, $p < 0.001$), while the identified regulated motivation (a more autonomic motivation) showed a significant increase ($M_0 = 2.73 \pm 0.50$ to $M_1 = 3.08 \pm 0.82$, $p < 0.05$). However, intrinsic motivation did not change significantly ($M_0 = 3.66 \pm 0.57$, $M_1 = 3.70 \pm 0.54$).

Conclusions:

The program seems to have a positive effect on the motivation of the children. In spite of non-significant changes in intrinsic motivation, a shift from non-autonomous motivation to more autonomic motivation was found. In addition, children were positive about the presence of a personal exercise buddy during the activities, which could indicate this element to be a positive motivational factor for engaging in physical activity. Recent data will be added to the analysis and the presentation.

PO.142

1 + 1 + 1 = Sport Motivation Scale Adolescent (SMSA) Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sport participation for adolescents

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Motivation towards sport participation can be measured by three valid questionnaires: the Behavioral Regulation in Exercise Questionnaire (BREQ2), the Situational Motivation Scale (SIMS) and the Sport Motivation Scale (SMS6). All three questionnaires are designed for adults. In practice, there is a need for motivational questionnaires in sport participation for adolescents. Especially among adolescents there are high rates of sport participation drop-out. Monitoring their motivation could give more insight in possible relations between different types of motivation and drop-out. Hence, the purpose of this study was to develop a questionnaire, suitable for adolescents.

Methods:

Data were collected among all second year students at the School of Sport Studies in the city of Eindhoven (the Netherlands) using an online survey. In total, 99 students (gender and age were evenly distributed) completed the questionnaire. An item-bank (60 items) was created based on three frequently used motivational questionnaires (BREQ2, 20 items; SMS6, 24 items; SIMS, 16 items). Before merging these three questionnaires, all items were translated to Dutch and similar answer scales were created (the 5-point Likert scale as included in the BREQ2). Principal Component Analysis (PCA) and internal reliability analyses were used to assess the underlying constructs.

Results:

Results of the PCA showed that five subscales fitted the data best, explaining 70,9% of the total variance. In accordance with the Self Determination Theory these subscales match the continuum of motivation with five out of six forms of motivation i.e. intrinsic motivation, identified regulation, introjected regulation, external regulation and amotivation. Analysis and interpretation of the different Cronbach alpha's and corrected item-total correlations resulted in four representative items per subscale, in total 20 items. Cronbach's alpha's of the subscales ranged from 0.71 to 0.87.

Conclusion:

Findings of this study can have important implications for the measurement of motivation towards sport participation in adolescents. Future studies should be conducted with larger samples to confirm our findings. Our proposed questionnaire (SMSA) may facilitate research exploring how adolescents are motivated for participation in sports, which in turn could be used to adjust guidance and coaching to meet the needs of adolescents.

PO.143

Acceptability and relative validity of myfood24 among British adolescents against an interviewer administered 24 hour recall

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SIG: Yes, e- & mHealth

Awards:

Purpose: myfood24 is the first UK online 24hour dietary assessment tool developed for use among all age groups. Limited information is available regarding the validity of using new technology in assessing dietary intake among adolescents. This study aims to assess the acceptability and validity of myfood24 against a face-to-face interviewer administered 24hour recall.

Method: 75 adolescents aged 11-18 years old were asked to complete myfood24 and provide an interviewer administered 24hour recall on the same day for two non-consecutive days in a school setting. All participants then completed an acceptability questionnaire. Total energy intake and macronutrients recorded by the two methods were compared using intraclass correlation (ICC), Bland Altman plots and Kappa/weighted Kappa to assess agreement.

Results/Findings: Energy and macronutrients reported via myfood24 demonstrated strong agreement with the interview data; ICC = 0.88 (95% CI: 0.84, 0.91) for energy intake (EI). There was no significant bias between the two methods, the mean difference (myfood24 - interview) being -55 kcal (-230kJ) (95% CI: -117, 7.2 kcal, (-489.5 to 30.0 kJ)) with limits of agreement ranging between -39% (-797 kcal (3334kJ)) to 34% (687(2874KJ)) using multiple observations per each individual. Similar findings were found for day 1 and day 2 separately. There was good agreement in terms of classifying adolescents correctly into tertiles of EI ($k = 0.51$ & $k_w = 0.62$). myfood24 was well received by adolescents and they found it attractive and easy to use; the mean system usability score (SUS) was 74 /100 (95%CI 71, 77) and the average time to complete myfood24 was 16 (SD=5) minutes.

Conclusions: myfood24 is a valid, reliable and easy to use tool among British adolescents. myfood24 has the potential to collect dietary data of comparable quality to that of an interview, with the advantages of supporting larger sample sizes and providing immediate results.

PO.145

ESC Project: The influence of strangers in moderate-to-vigorous physical activity. A randomized controlled trial

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SIG: Yes, Policies and environments

Awards:

Purpose:

Programs that promote behavior changes towards Physical Activity (PA) seem warranted. Recent research emerging from Deci and Ryan's Self-Determination Theory shows that PA can be "contagious". Interventions with family, friends, peers and media figures seem to show results in behavior change promotion. Nevertheless, PA social contagion through strangers is not well known. So, the aim of this randomized controlled trial was to analyse the association between social contagion through strangers and PA levels.

Methods:

Data from the ESC (Exercise Socially Contagious) Project were used. In total, 74 adults (18-64 years), both genders, were allocated in two groups (37 participants each): intervention group (IG), which were exposed to strangers (staff members) talking about PA, ten people doing PA (prepared actors) and a PA video while they were walking into the college facilities; control group (CG), was only exposed to a video about healthy nutrition. The short form of the International Physical Activity Questionnaire (IPAQ-SF) was completed at baseline and 1 week after the intervention.

Results:

The CG increased moderate intensity PA time (M=24.14, SD=67.87), while IG decreased (M=-29.58, SD=74.65), a significant difference ($t(69)=3.17, p=.002, r=.36$) in a week. No differences were found between CG and IG in walking time or vigorous intensity PA ($p>.05$). However, when we analysed the time spent in moderate-to-vigorous intensity PA (MVPA), there was, on average, an hour and 20 minutes difference ($t(69)=2.90, p=.005, r=.33$) between CG and IG. So, the CG increased (M=43.77, SD=110.85) its MVPA, while IG decreased (M=-40.69, SD=132.96).

Conclusions:

Participants who were exposed to strangers doing and talking about PA reported approximately 40 min less MVPA in a week. Meanwhile, those who were exposed to a video about healthy nutrition increased their MVPA in about 40 min in a week. This change is mostly due to moderate PA that had a 60 min difference between groups at the end of the intervention. These results were contrary to the hypothesis. Possibly, social desirability, played a role on the IG responses, so further testing with objective measures is being conducted.

Keywords: ESC Project, Social Contagion, Behavior Change, Physical Activity

PO.146

Physical activity and physical fitness in normal weight and overweight Czech adolescents

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Palacký University, Olomouc, Czech Republic

SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Lack of physical activity and poor eating habits among adolescents have a negative effect on body weight and overall body composition. We assumed that overweight adolescents are less physically active and have lower level of physical fitness; the two important factors contributing to human health. The objective of this study was to compare physical activity and physical fitness across normal weight and overweight Czech adolescents.

Methods: A total of 282 adolescents (132 boys and 150 girls) aged 12-15 years participated in this study. Physical activity was monitored for 7 days using the Yamax SW-700 pedometer. Physical fitness was assessed using the Indares test system (PACER, push-ups, curl-ups and V-sit and reach) in physical education lessons. Body composition was measured using a calibrated skinfold caliper. Binary logistic regression models were computed to assess the association of body composition with physical activity and physical fitness.

Results/findings: Results showed that 61 (21.6 %) of Czech adolescents were overweight. The adolescents with normal body weight were more likely to have higher level of physical fitness than overweight adolescents (OR = 7.9; 95 % CI [3.8; 16.4]). No significant result was found when associating body composition with physical activity. Considerably more girls (46.7 %) were meeting physical activity recommendations than boys (34.1 %).

Conclusions: The study verified that body composition is a significant factor influencing physical fitness. However there was no significant impact of body composition on physical activity in Czech adolescents. Future research should focus on looking for more correlates influencing physical activity and physical fitness in adolescents.

PO.147

Abstract: The physical activity levels achieved during infrared sensor active video gaming (AVG) in children with and without Autism Spectrum Disorder (ASD)

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Research has shown that children with ASD have higher rates of obesity and lower amounts of moderate to vigorous physical activity (MVPA) than their neurotypical peers. Can AVG be used to help increase physical activity (PA) levels in this population? The purpose of this study was to investigate PA levels during Infrared Sensor AVG in boys with and without ASD.

Methods:

We used a repeated measure design with two groups and three physical activity conditions. Groups included 9 boys between 8-11 years old with ASD and 8 controls without ASD matched for age and BMI. Conditions included two video games, sedentary (SVG) and active (AVG) on an Xbox 360 platform and continuous walking. Each participant was randomly assigned an order of conditions. For each testing session, participants warmed up then performed a 20 minute activity bout while wearing a Minimitter Accelerometer. Dependent measures included activity count (AC) and percent time in MVPA (%MVPA). These measures were compared using a repeated measure ANOVA between group and condition.

Results/findings:

The ASD and control group did not differ in either AC ($p=.273$) or %MVPA ($p=.107$). Conditions did differ significantly. A Bonferroni post hoc analysis revealed that in both %MVPA and AC, SVG was significantly lower than AVG ($p<.0001$), which was significantly lower than walking ($p<.0001$). The lack of group differences suggests that children with ASD require no adaptations to AVG or walking in order to achieve similar levels of MVPA their neurotypical peers. While walking had the highest levels of %MVPA, levels were obtained over 77.65% of the interval during AVG. This supports the use of AVG as one method of increasing PA in ASD

Conclusions:

AVG has the potential to be used as additional PA to assist in meeting the recommended 60 minutes of MVPA in boys with and without ASD.

PO.148

Developing and testing the acceptability of electronic messages delivered to help parents choose effective strategies to engage their families in healthy food and drink choices

Tisa Hill, Alisha Gaines, Erin Green, Laura Thomas, Jamie Dollahite
Cornell University, Ithaca NY, USA

SIG: Yes, Children and families

Awards:

Objective: To develop and test relevant and effective electronic messages for parents in support of increasing their middle school children's healthy food and drink choices at home and at school.

Methods: Following formative focus groups (n=7) with mixed income parents (n=46) of middle school students in urban and rural settings, researchers conducted interviews (n=17) with additional parents in order to rank messages and identify strategies for encouraging children to engage in healthful eating. In order of preference, parents ranked messages addressing core nutrition practices related to promoting fruits/vegetables and low-fat dairy, and limiting sweetened drinks and selected strategies they deemed feasible in their family context. Results were used to narrow the range of and influence editing of messages and strategies to be offered to parents weekly by email in a forthcoming pilot study.

Results: Top vegetable and fruit messages promoted variety and recognized the importance of role modeling. Most popular drink messages reinforced water as a preferred beverage. Top messages in support of healthy eating promoted family meals and having healthy foods available in the home. Parents preferred strategies that engage children in selecting available foods and limit unhealthy foods by offering healthy foods for snacks and meals.

Conclusions: These results are being used to design a pilot study guided by the Model of Goal Directed Behavior. As parents ranked highest simple and direct messages that supported their parenting roles, messages will be crafted to reflect this preference. In an upcoming pilot, parents of middle school students will receive two messages per week for 6 weeks and will be asked to select one of three strategies each week to try with their families. Messages will be emailed and contain links to additional resources and social media sites. All messages will provide links to accompanying blog and Facebook page with posts related to nutrition topic of week.

PO.149

The role of active transport in meeting the recommended number of steps per day among Czech and Polish adolescents

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Active school transport may be an important source of youth's physical activity. Solutions that increase physical activity without putting added pressure on the school curriculum merit consideration. Thus the aim of this study was to assess the effect of active transport, particularly walking, on the probability to meet the sufficient level of daily physical activity.

Methods:

Research sample consisted of 1864 Czech and Polish adolescents (38% males, mean age 16.2). To assess the active transport, the long form of International Physical Activity Questionnaire (IPAQ) was used. The walking behaviour was objectively measured by pedometers. 11000 steps per-day was set as a cut-point for determining the sufficient walking activity. To assess the relation of adolescents' active transport to recommended number of steps, logistical regression models were computed. Analyses were performed separately for both genders and controlled for the age of respondents.

Results:

The number of reported Transport Walking MET-minutes did not affected the probability of meeting the recommended daily number of steps among boys. On the other hand, among girls, the higher reported Transport Walking MET-minutes, the higher the probability of meeting the recommended daily number of steps. The gradient was statistically significant [Q1 - ref.; Q2 - OR 1.62(CI95% 1.16-2.26); Q3 - OR 2.10(CI95% 1.52-2.90); Q4 - OR 1.79(CI95% 1.27-2.52)].

Transport Walking MET-minutes contributed to total Walking MET-minutes by 47% among boys and by 48% among girls with no statistical differences between genders. On the contrary, when overall physical activity was taken into account, Transport Walking MET-minutes contributed into Total physical activity MET-minutes by 18% among boys and significantly more (by 23%) among girls.

Conclusion:

Probably due higher overall level of physical activity, walking for transport does not play a substantial role in meeting the recommended level of walking among adolescent Czech and Polish boys. Not among girls, where walking for transport creates much more important component of daily physical activity. Policies aimed to promote more active school transport in order to reach the recommended levels of daily physical activity of young females seem to be meaningful in Central European settings.

PO.150

'It's like a personal motivator that you carried around wi' [with] you': men's experiences of wearing a pedometer to quantify and increase their physical activity levels: Evidence from Football Fans in Training (FFIT).

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SIG: Yes, Motivational Dynamics

Awards:

Objective: To explore men's experiences of using pedometers as motivational tools both during and after taking part in Football Fans in Training (FFIT), a gender-sensitised weight loss and physical activity (PA) programme, delivered to overweight/obese men via Scottish Professional Football League (SPFL) clubs.

Methods: 12 SPFL clubs delivered FFIT to 203 men in February-April 2012. Semi-structured telephone interviews (n=28) were conducted post-programme with a sub-sample of men from four clubs. Data were analysed in accordance with the principles of thematic analysis and interpreted through the lens of Self-Determination Theory (SDT; Deci & Ryan, 2000).

Findings: During the 12-week programme, the feedback from the pedometer supported feelings of competence providing the men with 'proof' of success in achieving their PA goals. This in turn, promoted feelings of satisfaction and autonomous motivation. However, in contrast to earlier findings not all men expressed positive experiences with using the pedometer and some said they found it 'dispiriting'. Consistent with SDT, the setting provided an autonomy-supportive climate: the peer support from other men 'like them' and the community club coaches. Proximity to the professional football club inspired the men to utilise the pedometer within an environment that was congruent with their identities.

Enduring use of the pedometer after the 12-week programme could be explained in three ways: '*ultimately internalised*': These men no longer used the pedometer to the same extent and redefined themselves by integrating new-found activities into their daily lives which they described as something they enjoyed. '*Continuing perceived need for self-monitoring technologies to support PA*': These men remained reliant on quantification but described the use of objective technology as something they enjoyed. '*Externally regulated*': These men no longer continued to use the pedometer, social support within the programme appeared to be more important than having a technology for self-monitoring. These men were less likely to have achieved their 5% weight loss goal post-programme.

Conclusions: Congruent with SDT, the pedometer feedback promoted autonomous motivation for engaging in PA. However, some men remained reliant on more extrinsic factors (i.e. the football club setting and peer support from the coaches or the group were too important).

PO.151

Process Evaluation of a Smarter Lunchrooms Intervention: Unique Application of the RE-AIM Framework

Alisha Gaines, Tisa Hill, Laura Thomas, Jamie Dollahite
Cornell University, Ithaca, NY, USA

SIG: Yes, Policies and environments

Awards:

Objective:

To adapt the RE-AIM framework to guide process evaluation of a Smarter Lunchroom (SL) intervention conducted in US middle school cafeterias.

Methods:

The SL intervention aimed to improve student food selection and consumption using small, low cost environmental changes in 25 New York state public middle school cafeterias. Parallel process evaluation was conducted in order to describe fidelity to protocol and inform future iterations of the intervention. Modified RE-AIM dimensions (reach, effectiveness, adoption, implementation, and maintenance) were operationalized for environment-based, as opposed to individual-based, application. To facilitate impact discussions, methodological approaches within each RE-AIM dimension were classified into short-, medium-, and long-term outcomes.

Results:

Reach was defined using the number of eligible middle schools participating in the intervention and the number of enrolled students in each school in order to describe the absolute number and proportional representation of students exposed to the intervention. Effectiveness, while typically defined in terms of intervention outcomes was modified for use in this process evaluation to include the external influences expected to affect intervention outcomes. These included sources of contamination, e.g. food and health promotions associated with National Nutrition Month, and aspects of school cafeterias already aligned with the protocol pre-intervention. Adoption was defined as the number and percentage of cafeteria staff trained and their reported preparedness to initiate the intervention. Implementation was described as fidelity to each component of the intervention protocol, while maintenance was the extent of adherence beyond the intervention end date. Reach data were considered short-term outcomes, adoption and implementation medium-term outcomes, and maintenance data were long-term outcomes.

Conclusions:

RE-AIM served as a valuable framework for designing a process evaluation for an environmental intervention. This modified model has specific applicability to SL interventions which are being adopted broadly in the US, but it may also be useful for similar planning or evaluation and for those seeking to operationalize RE-AIM dimensions to meet the unique needs of environmentally-focused research and programming.

PO.152

Sociodemographic and health factors associated with the frailty phenotype in Brazilian elderly

Sheilla Tribess, Jair Sindra Virtuoso Junior
Federal University of Triangulo Mineiro, Uberaba, MG, Brazil

SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The objective of this study was to estimate the prevalence and correlates of frailty in a representative sample of community-dwelling older people.

Methods: Epidemiological study of a cross-sectional sample, stratified simply random manner from 622 individuals, between 60 and 96 years of age, registered at 35 Family Health Teams in the urban area of Uberaba, in Minas Gerais, Brazil. The frailty index (unintentional weight loss, functional impairment on rising from a chair, manual gripping strength, habitual physical activity, and exhaustion) was carried out based on Fried's study; the participants were classified dichotomously as frail and not frail. Descriptive analysis procedures were used in analyzing the data, the chi-square test and Poisson regression, $p \leq 0.05$.

Results: The prevalence of frailty was 19.9%, 19.7% were men and 20% women. The frailty was associated with age, perceived health, use of medications, elevated waist circumference, cognitive impairment, symptoms of depression, and the activities in the daily life for the women and for the men with to fall, smoke, and symptoms of depression.

Conclusions: Despite the prevalence of frailty syndrome be similar between the sexes, the associated factors were differentiated. The results suggest that interventions aimed at minimizing the effects of the aging process should be specific by sex.

PO.154

Aspects of a physical activity intervention in a low income community in Brazil: recruitment, reasons for participation and barriers.

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Departament of Gerontology, Federal University of São Carlos, São Carlos, São Paulo, Brazil

SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: This study aims to describe the recruitment strategies, reasons for participation in a physical activity (PA) intervention and barriers to PA. The need for programs that aim to prevent chronic diseases and health promotion increases as the population ages. However, one of the most challenging aspects to conduct interventions is the recruitment of participants.

Methods: The "Guided Walking Program" was a six month community-based intervention that offered walking and also educational workshops for behavioral change to adults and older adults living in a socioeconomically disadvantaged community in the city of Sao Carlos, Brazil. It was developed by a research team from the Federal University of Sao Carlos (Departments of Gerontology and Physical Education) in partnership with three Public Health Centers (PHC) of the community. Recruitment strategies included: recruitment of community health agent's patients; solicitation of patients in waiting rooms of the PHC; and door-to-door invitation.

Results: During the intervention, 72 participants (93% women, average age of 49 years) were interviewed about the reasons why they joined the program, 151 answers were collected and grouped into several categories. Results showed that the reasons for participation in this program were: Health improvement (26%), weight loss (18,5%), social support (12,5%), desire to be physically active (8,6%), management and treatment of diseases (8%), doctor's referral (6%), desire for outdoor activities (4%), body aches and muscle discomfort (3,3%), make company to a family member or a friend (2,6%), belief in the importance of physical activity (2,6%), improvement of sleep quality (1,3%), stress management (1,3%) and others (5,2%). 31 community-dwelling (average age of 58 years, 71% women) were interviewed about barriers for physical activity, as they were non-participants of the program. The barriers were assessed using the Questionnaire of Barriers to Physical Activity Practice and the most related barriers reported by this group were (rates over 30%): illness or injury, weather, lack of company, fear of falling or getting hurt, being active enough and lack of money.

Conclusions: These findings provide a better understanding about why people in this context seek a physical activity program and show also strategies to develop programs in similar contexts.

PO.155

How many calories did I just eat? An experimental study examining the effect of proposed changes to nutrition labels serving size

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SIG: Yes, Policies and environments

Awards:**Purpose:**

Nutrition labels are required in over 50 countries and are aimed at increasing consumers' selection of healthy foods and improving diet. However, consumers struggle to understand labels, especially serving sizes. The U.S. Food and Drug Administration and Health Canada are revising nutrition labels on prepackaged foods, including changes to serving size labelling. The current study tested whether potential modifications to nutrition label serving size information increased calorie content understanding among youth and young adults.

Methods:

A sample of 2,010 Canadian youth and young adults (16 to 24 years) completed two online experiments. First, participants were randomly assigned to view a beverage nutrition label with a reference amount for a *single serving* (250ml), the *entire container* (473 ml), or a *dual-column* format with both reference amounts. Participants were then randomized to view a second nutrition label which either specified a single serving in *small font*, a single serving in *large font*, or the number of *servings per bag* with single serving info below. In each experiment, participants were asked to calculate caloric intake if they consumed a specified quantity of the beverage or food. Logistic regression analysis modelled correct calorie estimation. Using chi-square analysis, a discrete choice measure assessed preferred display format.

Results:

In experiment 1, participants randomized to view the nutrition label with *entire container* or *dual-column* were more likely to provide correct calorie information than those using *single serving* information ($p < .01$). For experiment 2, the serving size display format had no association with correct calorie estimation. Youngest participants (16 to 18 years), those who provided BMI information and had normal weight BMI (compared to obese BMI) were more likely to answer correctly. The majority of participants (61.9%) preferred the serving size format that included *servings per bag*.

Conclusions:

Serving sizes that reflect volumes typically consumed are easier to understand among youth and young adults. Consumers prefer nutrition labels that include more prominently featured serving size information. However, consumers still struggle with nutrition information predicated on basic mathematical calculations. These results have direct implications for nutrition labelling policy.

PO.156

Evolutions in Kenya's Non-Motorised Transport: Potential Avenues to Support Physical Activity

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SIG: Yes, Policies and environments

Awards:**Purpose:**

Within developing countries, a common source of physical activity is non-motorised transport (NMT) – walking or bicycling for transportation. However, levels are decreasing as motorised options become more affordable. The purpose of this study was to examine recent high-level multisectoral efforts within Kenya that support NMT through changes to the build environment.

Methods:

Data collection for this qualitative study occurred in Nairobi, Kenya. Purposive sampling identified key informants from primarily outside the health sector, including city planners, engineers and transportation experts. Semi-structured in-depth interviews were conducted with 29 participants consisting of national and local government officials, United Nations agencies, development banks, donors, advocates and researchers. Field notes and audio-recordings were analyzed inductively through coding and theming.

Results:

Kenya was undergoing an infrastructure building boom and the inclusion of walking and cycling facilities was considered novel. The necessity of appropriate NMT infrastructure was increasingly being acknowledged in Kenya's national and local policy. International donors and development partners required NMT facilities in development projects. Amid the enthusiasm there were concerns about how poor quality NMT designs discouraged use, leading to perceptions that NMT infrastructure was unnecessary. The motivations for NMT's increased priority were numerous: heightened awareness of pedestrian traffic injuries, high volumes of pedestrians, attention to sustainable transport, pro-poor considerations and environmental consciousness. Supporting physical activity for chronic disease prevention was a very minor motivation. Key informants acknowledged physical activity as important but pointed to stigma and safety issues as continuing challenges. Practical strategies to promote the health benefits of active transportation were identified, with health sector leadership seen as essential.

Conclusions:

Kenya is an example of a developing country where there appears to be growing ownership and support among government for policies and projects that improve NMT infrastructure. Physical activity goals are currently a minor consideration. With action on NMT already underway, health stakeholders must pursue strategies to align with current NMT objectives as a means of promoting chronic disease prevention through active transportation.

PO.158

Implementation of clinical guidelines on diabetes and hypertension in urban Mongolia: A qualitative study of primary care providers

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SIG: Yes, Policies and environments

Awards:

Background: Hypertension and diabetes, key risk factors for cardiovascular disease, are significant health problems globally. Evidence indicates that the risk of cardiovascular disease and diabetes can be reduced through the adoption of a healthy diet, regular physical activity and avoidance of tobacco use. As cardiovascular disease is one of the leading causes of mortality in Mongolia since 2000, clinical guidelines on arterial hypertension and diabetes were developed and implemented in 2011. Although the guidelines covered a broad range of screening and management aspects of hypertension and diabetes, the guidelines take particular account of lifestyle interventions. This paper explores the barriers and enablers influencing the implementation of the diabetes and hypertension guideline lifestyle recommendations in the primary care setting in Mongolia.

Methods: A phenomenological qualitative study with semi-structured interviews was conducted to explore the implementation of the diabetes and hypertension guidelines at the primary care level, as well as to gain insight into how practitioners view the useability and practicality of the guidelines. Ten family health centres were randomly chosen from a list of all the family health centres located in Ulaanbaatar City. In each centre, a focus group discussion with nurses (n=20), and interviews with practice doctors (n=10) and practice managers (n=10) were conducted. Data was analysed using a thematic approach utilising the Theoretical Domains Framework.

Results: All study participants were aware of the guidelines and the majority of them stated that they had incorporated them into their daily practice. They also reported having attended guideline training sessions which were focused on practice skill development. The majority of participants expressed satisfaction with the wide range of resources that had been supplied to them by the Mongolian Government jointly with the Millennium Challenge Account-Mongolia Health Project to assist with the implementation of the guidelines. The resources, supplied from 2011 onwards, included screening devices, equipment for blood tests, medications and educational materials. Other enablers were the participants' commitment and passion for guideline implementation and their belief in the simplicity and practicality of the guidelines themselves. Primary care providers reported a number of challenges in implementing the lifestyle components of the guidelines, including frustration caused by increased workload and long waiting times, time constraints, difficulties with conflicting tasks and low patient health literacy.

Conclusion: This study provides evidence that comprehensive and rigorous dissemination and implementation strategies increase the likelihood of successful implementation of new guidelines in low resource primary care settings.

PO.160

Developing a survey question on factors influencing body image among adolescents

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

In Ireland, young people have highlighted body image as an issue of concern for them. Consequently, the Department of Health (DoH), Ireland requested that a 2014 representative health behaviour survey of school children include a question on the factors that influence adolescent body image. Therefore, the aim of this study was to develop and pilot a question for use in a survey administered in schools.

Method:

A literature review was conducted to investigate whether other national surveys of children had included a question exploring body image influences. International experts on body image were also contacted to assist in identification of a question. A single item was not identified thus two open ended questions were developed which included: "What influences how you feel about your body image?" and "What influences how you feel about your body shape?". The questions were piloted with adolescents (n=75) aged 13-17 years and data of their views and opinions of the questions were collected. Data were transcribed verbatim and analysed to explore face validity of the questions and responses obtained.

Results:

Overall, results indicate that young people understood and could answer both questions. Adolescents preferred use of the term "body image" as opposed to "body shape" as this term conceptualises what body image means to them. Body image implies physical attributes other than weight (e.g. facial beauty, hair colour, self-confidence) as opposed to the "body shape" question. Results from the pilot also reveal that factors influencing body image were valid and varied, including clothes, parents, peers, celebrities and sports players.

Conclusion:

Involving young people in question development is key to ensuring meaningful data can be collected. Pilot data indicate that the factors influencing adolescent body image vary for adolescents in Ireland, and further analyses of the national child health survey data, will reveal how such influences impact problematic eating behaviors and excessive exercise behaviors during adolescence.

PO.162

Systematic Review of Sedentary Behavior and Cognitive Development in Early Childhood

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SIG: Yes, Early care and education

Awards:

Purpose: Early childhood, birth to five years, is the most critical and intensive period of brain development through the lifespan with implications for life-long health and well-being. Understanding the factors that impact optimal cognitive development is of great importance. The purpose of this study was to comprehensively review all observational and experimental studies examining the relationship between sedentary behavior and cognitive development during early childhood.

Methods: Electronic databases were searched in July, 2014 and no limits were imposed on the search. Included studies had to be peer-reviewed, published, and meet the a priori determined population (apparently healthy children aged birth to 5 years), intervention (duration, types, and patterns of sedentary behavior), comparator (various durations, types, or patterns of sedentary behavior), and outcome (cognitive development) study criteria. Data extraction was conducted in October and November 2014 and study quality and risk of bias were assessed in December 2014.

Results: A total of 37 studies, representing 14,487 participants from nine different countries, were included. Thirty-one studies used observational study designs and six studies used experimental study designs. Across study designs, increased or higher screen time (primarily television viewing (TV)), reading, child-specific TV content, and adult-specific TV content had detrimental associations with cognitive development outcomes for 38%, 0%, 8%, and 25% of associations reported, respectively. Across study designs, increased or higher screen time, reading, child-specific TV content, and adult-specific TV content had beneficial associations with cognitive development outcomes for 6%, 60%, 15%, and 3% of associations reported, respectively. Ten studies were moderate quality and 27 studies were weak quality. Studies rated as moderate quality reported a significant greater proportion of detrimental findings (36 vs. 14%) and lower proportion of null findings (52 vs. 73%) compared to studies rated as weak quality.

Conclusions: Different types of sedentary behavior may have different impacts on cognitive development in early childhood. Future research with reliable and valid tools and adequate sample sizes that examine multiple cognitive domains is needed to better understand the impact of different types of sedentary behavior on early cognitive development and to provide clarity for inconsistent relationships.

PO.163

Associations between correlates of sedentary behavior and socioeconomic position among youth: a systematic review

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose:

Existing research evidence indicates that children and adolescents of parents with a low socioeconomic position spend more time on sedentary behavior than their counterparts. However, the mechanisms driving these differences remain poorly understood. The main aim of this systematic review was to summarize the evidence regarding the association between socioeconomic position and correlates of sedentary behavior among youth.

Methods:

A systematic literature search was conducted using the databases Medline, Embase, PsycINFO and Web of Science. Observational studies were included as well as intervention studies if baseline data or data among the control group only were used. In order to be included in this review, studies needed to include an analysis of the association between at least one correlate of SB and at least one indicator of SEP. In addition, studies assessing the mediating effect of correlates in the relationship between SEP and SB were included, as were studies looking at the moderating effect of SEP in the relationship between correlates and SB. Studies published in English between January 1990 and August 2014 including children and adolescents (0-18 years) and conducted in developed countries (OECD countries) were included. A coding approach for the consistency of associations was used. Assessment of study quality was also done.

Results/findings:

A total of 37 studies of moderate to low quality were included. Education was the most commonly used indicator of SEP, followed by income. SEP was consistently inversely related to the presence of a TV in the child's bedroom, parental modelling for TV viewing, parental co-viewing and eating meals in front of the TV. Rules and regulations about screen time were found to be unrelated to income and inconsistently related to parental education.

Conclusions:

The findings hint to the important role that parents could play in efforts to tackle socioeconomic differences in sedentary behavior. Further research is however required to provide a more comprehensive understanding of mediators of socioeconomic differences in sedentary behavior to be used in interventions. More studies of high quality are also called for as the findings of this review were drawn from studies which were of moderate quality at best.

PO.164

Acceptability of a Fan Based Community Healthy Lifestyle Programme: Participants' Insights

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SIG: Yes, Motivational Dynamics

Awards:**Purpose:**

In providing a community-based healthy lifestyle programme it is prudent to gain further understanding of participants' enrolment, expectations, and adherence to the programme. Fans4Life is a 10 week healthy lifestyle programme delivered in a professional football club broken down into two one hour sessions focusing on health and well-being topics, and a physical activity session. The purpose of this poster is to investigate Fans4Life participant insights concerning what helps attract and retain involvement in a community health programme.

Methods:

A qualitative research design utilizing interpretive thematic analysis was used to explore the data. Semi-structured telephone interviews using open-ended questions were conducted with programme completers ($n = 6$). Questions focused on programme recruitment and enrolment, what they liked about the programme and suggested changes, expectations from participating, and reasons for adherence. Participants were recruited purposively via email invitation. Interviews were recorded and transcribed verbatim. Data were coded into a series of text units providing general themes.

Results/Findings:

In terms of recruitment participants noted the club website was the main driving force, followed by advertising in the clubhouse, club bars, match day programme, word of mouth, and a friend's referral. Programme enrolment was seen as being easy to complete and participants liked the programme balance between the education and physical activity sessions, having experts in their field present, materials to read at home, not having to pay to attend, a personal health check at programme start and conclusion, and a professional and friendly environment. Varying evening programme time offerings was a suggested aspect to change. Expectations upon enrolling were to learn something new and enhance health knowledge, and become more physically active. Adherence factors were the team connection, physical changes and health benefits, social connectivity, motivation, health education and exercise sessions.

Conclusion:

Participants indicated acceptability of the programme and provided additional insight for recruitment strategies, programme features, expectations, and adherence for participation. Future community-based health promotion programmes may benefit from gaining a greater understanding of what attracts participants to initiate and adhere to a healthy lifestyle programme.

PO.165

The longitudinal interplay of motivation, exercise and weight change in overweight women

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Understanding trajectories of change in both putative mediators and outcomes of health behavior change interventions is a much needed research endeavor. However, little is known about parallel relationships of change among these variables. The purpose of this study was to explore motivation, exercise behavior and weight change trajectories over four measurement points across 36 months and examine the relations between the emerging patterns of change, both from a between and a within person perspective.

Methods: This study is part of a randomized controlled trial consisting of a 1-yr self-determination theory-based intervention and a 2-yr follow-up with 221 female participants (37.6 ± 7 yr., 31.6 ± 4.1 kg/m²). Latent growth curve models (LGCM) were used to analyze the associations between changes in weight, exercise (assessed with 7-day physical activity recall) and motivational variables, both general (via Self-Determination Scale:SDS)) and exercise specific (Intrinsic Motivation Inventory:IMI)).

Results: Parallel LGCM were used to analyze the data with acceptable fit (CFI>.90 for all models). Correlations between intercepts (starting point) showed that baseline levels in weight were not significantly related to any of the intercepts for the motivational variables. Exercise levels at baseline were, however, strongly associated with all IMI levels at baseline ($rs=.57$ to $.87$, $ps<.001$), but not with SDS. Between-person level associations of change showed that women who increased more in motivation decreased more in weight across the study, and vice versa, as indicated by significant, strong, negative associations between slopes ($rs= -.45$ to $-.66$, $ps <.001$). Changes in motivation were also moderately to strongly associated with change in exercise ($rs=.48$ to $.76$, $ps<.001$). On a within-person level (occasion-specific or state-like fluctuations) if an individual was higher on motivation at a specific occasion, then she also had lower weight ($rs=-.14$ to $-.34$, $ps<.01$) and higher exercise ($rs=.14$ to $.21$, $ps <.01$) than expected from her curve.

Conclusions: Results highlight the dynamic interplay between different elements of the change process. Trajectories (not only current or previous levels) of self-determined motivation, both general and exercise-related, are interrelated over time and predict continued exercise participation and weight change. This has implications both for practical intervention research as well as for theory development.

PO.166

'I like to be able to see the light at the end of the tunnel': qualitative field study findings on how anticipation of the end influences affective responses during exercise

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SIG: Yes, Motivational Dynamics

Awards:

Objective:

Affective responses predict future exercise behaviour-the better people feel during exercise, the more likely they are to continue. Most research on affect during exercise is lab-based, but there is evidence that affective responses in laboratories differ from those in everyday environments. Qualitative research on affective responses to exercise is scarce, yet more is needed to understand what factors are influential, and how these can be altered to improve affective responses to exercise.

Methods:

'Running Commentary: a study of feelings during exercise' was a mixed methods field study examining beginner running groups (qualitative findings alone covered here). I investigated runners' affective responses to exercise in a naturalistic environment: 'naturalistic' meaning both the outdoor environment, and also the everyday, group-based nature of the exercise. Mobile interviewing (a novel method for capturing in-the-moment responses during exercise instead of incomplete retrospective accounts) was used. The theoretical framework employed was Ekkekakis's Dual Mode Model.

Results:

Interviews were analysed thematically-here the single thematic focus is 'anticipation of the end'. Previous lab-based research demonstrates this theme's importance, but my study gives additional insights. In laboratory research using continuous exercise, 'anticipation of the end' referred purely to a single timepoint. Outdoors, a geographical aspect was often evident. Participants preferred a physical finish, and an unclear endpoint was disappointing. For run-walk intervals, multiple 'micro' anticipations of the end influenced affective responses. The end was often used to improve affect, when participants felt confident in increasing intensity to gain feelings of exhilaration and achievement.

Conclusions:

Practical applications are numerous. People need to know exercise session structure to pace themselves for optimum affective responses. Session structure should therefore be simple to understand and remember. Intervals (e.g. run-walk) should be clearly signposted. Adding extra time should be avoided, especially with beginners, who seem sensitive to tiny increases. Encouragement of additional effort towards the end of a session is acceptable, but caution should be used before this, as increasing intensity earlier is often associated with unpleasant feelings. For outdoor exercise, geography requires consideration. Routes should be easy to follow, with an unambiguous finishing point, perhaps aided by mapping technology.

PO.167

Improving methods to measure physical activity: using accelerometry, wearable cameras and interviews to reconstruct time use

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Self-report time use diaries collect a continuous sequenced record of daily activities but the validity of their data is uncertain. Our study aimed to test the validity of time use diaries for measuring physical activity and to explore the feasibility of using accelerometry, wearable cameras, and an image-led interview to improve physical activity measurement.

Methods: 16 volunteers completed the Harmonised European Time Use Survey (HETUS) diary, wore an accelerometer, and used an Autographer wearable camera (recording images at approximately 15 second intervals) for the waking hours of the same 24-hour period. Participants also completed an interview in which visual images were used as prompts to reconstruct a record of activities for comparison with the diary and accelerometry records.

Results/findings: We found that accelerometry provided data on the intensity of physical activity which is not captured via traditional time use diaries. The use of images provided an objective and more accurate estimate of physical activity duration, compared to time use diaries, while also offering information on the type and context of physical activity behaviour. These combined methods enable more accurate estimates of total physical activity and energy expenditure (through the assignment of METs), as well as providing information on the location, type, and social context of physical activity participation.

Conclusion: This study demonstrates that using new methods, such as wearable devices and interviews, has considerable potential to increase our understanding of physical activity behaviours. These new methods have particular utility in understanding the context for physical activity participation and provide useful tools for understanding trends in physical activity over time, maximising best use of historical time use diary data. These new methods also offer significant potential in improving our understanding of other lifestyle behaviours such as sedentary time, e.g. images can assist in identifying transition points, differentiating standing from sitting, which is often misclassified using accelerometry cut points.

PO.168

The role of dinner consumption in successful weight loss maintenance.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: There is limited evidence on the role of dinner and the distribution of energy throughout the day in weight loss and weight loss maintenance. The present study aims to explore the potential effect of dinner timing, last eating episode timing, and energy and macro-nutrient distribution on long-term weight loss maintenance, in a sample of the Greek population consisting of both maintainers and regainers.

Methods: The present study was part of the MedWeight, an observational study. The sample consisted of 384 adult volunteers who had been at least overweight and then achieved significant weight loss ($\geq 10\%$), intentionally. Volunteers were classified as maintainers if they were maintaining this loss for at least a year and regainers if they had regained weight. Participants completed questionnaires through accessing study's website. Two telephone 24hour recalls were conducted for each volunteer. Timing of dinner and last eating episode was categorized in four time zones. Energy and macronutrient intakes were calculated for every eating episode within twelve time zones. Dinner was defined by directly asking the volunteer, whereas the last eating episode was defined as the last consumption of any food or drink. In addition, sleep quality was assessed using the "Athens Insomnia Scale" questionnaire.

Results: Maintainers were found to consume more calories between 02:00-03:59 than regainers ($p=0.048$) but no other difference was found between regainers and maintainers regarding the timing of dinner or last eating episode consumption. However, the timing of dinner and of last eating episode consumption was related to sleep quality (both $p=0.05$). Across maintenance status categories, this finding was evident for maintainers, but not regainers, with those eating their last eating episode or their dinner earlier reporting better sleep quality.

Conclusions: Our results do not support an effect of the timing of last eating episode or dinner consumption on weight loss maintenance. However, those who consume their evening meal earlier report better sleep quality. Future studies are needed to investigate the potential direct or confounding effect of sleep on weight loss maintenance.

PO.169

Community pharmacy interventions for public health priorities: a systematic review of community pharmacy-delivered smoking, alcohol and weight management interventions.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The Department of Health has identified interventions to manage smoking, alcohol and weight, delivered by community pharmacists, as public health priorities. The aims were: 1) to review the effectiveness of community pharmacy interventions to manage alcohol misuse, smoking cessation and weight loss; 2) to explore how demographic and socioeconomic variables moderate effectiveness; 3) to describe how interventions were organised, implemented and delivered.

Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed. The protocol is registered as PROSPERO CRD42013005943. Ten electronic databases were searched to May 2014. Supplementary searches included website, grey literature, study registers, bibliographies and contacting experts. Any type of intervention of any duration based in any country and in any age was included. Included interventions were set in a community pharmacy and delivered by the pharmacist or pharmacy team. Randomised controlled trials, non-randomised controlled trials, and controlled before-after studies were included. Data extraction and quality assessment was conducted independently by two reviewers. Meta-analysis and narrative synthesis were conducted.

Results: 24 studies were included from 14,000 records: 2 alcohol, 12 smoking cessation, 5 weight loss and 5 multi-component interventions (pharmacotherapy and lifestyle changes). Nine studies were UK-based; seven were rated 'strong' for quality. Pharmacy-based behavioural support and/or nicotine replacement therapy are effective and cost-effective in helping adults to stop smoking, particularly when compared to usual care. The pooled odds ratio for quit rates was 2.56 (95% confidence interval 1.45 to 4.53) for active control versus usual care. Evidence suggests that pharmacy-based weight loss interventions are as effective as similar interventions in other primary care settings but not as effective or cost-effective as weight loss interventions in commercial settings. There is insufficient evidence to assess the effectiveness of pharmacy-based interventions for alcohol management. Very few studies explored whether sociodemographic or socioeconomic variables moderated intervention effects. There is insufficient evidence to examine the relationship between behaviour change strategies and effectiveness; or implementation factors that underpin effective interventions.

Conclusions: Pharmacy-based interventions help adults to stop smoking but the impact on health inequalities is unclear. More information is required about pharmacist training and the behaviour change strategies employed.

PO.170

Non-mega multisport event impacts on local physical activity participation: perception from key stakeholders and local coaches

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SIG: Yes, Policies and environments

Awards:

Purpose:

Evaluate perceived impacts of a non-mega multisport event (Summer Jeux du Québec 2012) on physical activity and sports participation (PASP) among the local population by key stakeholders and local coaches.

Methods:

Local coaches and members of the organizing committee were interviewed about their expectations and perceptions of the Games impacts on the PASP in the host area (Shawinigan, Quebec). The study took place in two stages. A first series of interviews was conducted before the Games and the second round was conducted one year after the end of the event. The coaches' group was composed of individuals involved in local sports clubs. Administrators were stakeholders from the areas of education, health, community services and municipal administration all involved in the organization of the Games. Data collection was performed using semi-structured interviews recorded and analyzed using a content analysis method.

Results/findings:

During the interval pre to post Games, more coaches (89 pre to 100% post) and stakeholders (42% to 80%) perceived that infrastructure will have a strong influence on PASP. In coaches as well as in stakeholders, perception of positive effects on inter-organizational collaboration, economy and tourism, creation of new sport clubs all increased during the year after the Games. However, during this interval, perception that the Games would have positive impacts on physical and mental health of the population decreased. Most participants believed that the benefits of the Games will be observed in the long term. Promotion of sport and of active living is the most often mentioned way to maintain the positive effects of the Games.

Conclusions:

Participants perceived that the benefits of the Games will be measurable more than a year after the Games. The positive effects of the Quebec Games will be realized using promotion of sports and healthy lifestyles in the Shawinigan area. Participants suggested that a follow-up of the level of PASP would be necessary to assess the long-term impact of the event.

PO.171

Is weight lost on a diet and exercise intervention for men treated for prostate cancer maintained in the longer-term?

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Prostate cancer is the most common cancer in men in the UK. There is evidence to suggest that obesity is associated with prostate cancer aggressiveness and recurrence rates. This study aimed to examine body weight changes after two different weight loss interventions in overweight or obese men who had been treated for prostate cancer.

Methods: Fifty one men (mean±SD, age:65.5±5.5 years, BMI:29.6±2.9 kg/m²) who had been randomised to two groups at baseline, were re-contacted by mail at 12 months to provide information on weight. Group A had received a weight-management program package (group sessions, consultant's recommendation letter, pedometer, monthly telephone consultations with a dietitian and self-help online resources) for 3 months, whereas group B only received a pedometer, consultant's recommendation letter and access to online self-help resources after 3 months (waiting-list control). Weight at 12 months was compared with that recorded at 0 and 6 months.

Results: Twenty four of the men (47%) provided data on their weight 12 months after baseline. Median (IQR) weight change (WC) between baseline and 12 months was -2.9 kg (0.1, -6.6) (p=0.026) for group A (n=11) and -1.4 kg (0.5, -3.1) (p=0.071) for group B (n=13) (p=0.271 for between-group difference). WC between 6 and 12 months was -1.0 kg (+2.0, -2.5) (p=0.477) for group A and +1.0 kg (+2.4, -0.1) (p=0.055) for group B (p=0.111 for between-group difference).

Intention-to-treat analysis (using LOCF) including 51 participants showed that WC between baseline and 12 months was -2.1kg (-0.2, -6.0) (p<0.001) for group A and -1.4 kg (-0.2, -3.2) (p=0.002) for group B (p=0.109 for between-group difference). WC between 6 and 12 months was 0 kg (0.0, -1.0) (p=0.477) for group A and 0 kg (+1.0, 0.0) (p=0.055) for group B (p=0.071 for between-group difference). Multiple linear regression analysis showed no association between weight at 12 months and BMI, age, or time since diagnosis (p>0.05).

Conclusion: The evidence suggests that group A achieved significant weight loss which was maintained at 12 months. Group B achieved a smaller, non-significant change in weight. It seems that participation of health professionals may play a role in achieving and maintaining weight changes in men treated for prostate cancer.

PO.172

Does media use displace physical activity in adolescents? Results of the MoMo Study.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The displacement hypothesis predicts that physical activity and media use time compete in adolescents; however, to date evidence supporting this hypothesis is scarce and results on the interrelationship between physical activity and media use behavior in adolescents are inconsistent. A more differentiated approach at determining the interrelationship between physical activity and media use behaviors may be warranted. The aim of this study was to determine the relationship between physical activity and media use by identifying specific behavior patterns including physical activity in various settings (school, sports club, leisure time) and different types of media use (watching TV, playing console games, using PC/Internet).

Methods: Cross-sectional data of 2,083 adolescents (11-17 years) from all over Germany were collected between 2009 and 2012 in the Motorik-Modul Study. Physical activity and media use were self-reported (MoMo-PAQ). Cluster analyses (combination of Ward's method and K-means analysis) were used to identify behavior patterns of boys and girls separately.

Results/findings: Eight behavior patterns were identified for boys and seven for girls. Both sexes showed a pattern with low engagement in both physical activity and media use. In boys and in girls, three patterns had low physical activity levels (girls: 1.5-1.8 hours/week; boys: 2.0-2.6 hours/week) and high media use (girls: >4 hours/day; boys: >5 hours/day). Three (girls) to four (boys) patterns had high physical activity levels (girls: 5.2-7.8 hours/week; boys: 5.4-10.6 hours/week) and moderate media use (girls: 2.1-2.5 hours/day; boys: 2.3-3.8 hours/day).

Conclusions: The results of this study support the displacement hypothesis to some extent: In boys, very high media use displaced physical activity behavior, but very high physical activity levels did not displace considerable amount of time using any media. In girls, the high importance of other leisure activities became evident, which seem to partly displace physical activity as well as media use.

PO.173

The relationship of task and barrier self-efficacy with objectively measured physical activity in cardiac rehabilitation

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Self-efficacy is an important component of cardiac rehabilitation (CR) programs. Previous research examining the relationship between self-efficacy and physical activity during CR have relied on subjective measures of physical activity. Therefore, the current study examined the relationship between task and barrier self-efficacy and objectively assessed physical activity in CR.

Methods: Patients from the *ENCORE* study (N = 190) were asked to wear an accelerometer for 9 days at the beginning (i.e., within the 1st 3 weeks) and end (i.e., within the last 2 weeks) of CR and completed a social ecological survey that included the task and barrier self-efficacy measures, respectively. The study sample was predominately < 65 years of age (56%), male (76%) and White (95%). A standard multiple regression was used to assess the ability of task and barrier self-efficacy for predicting levels of moderate-to-vigorous intensity physical activity (MVPA), after controlling for the influence of age, sex, and number of co morbidities. Separate regression analyses were conducted for the beginning and end of CR.

Results: At the beginning of CR, task self-efficacy was found to significantly predict MVPA ($\beta = .34, p < .001$), whereas barrier self-efficacy did not ($\beta = .03, p > .05$). Similarly, at the end of CR, task self-efficacy significantly predicted MVPA ($\beta = .25, p < .001$) with no significant relationship found for barrier self-efficacy ($\beta = .02, p > .05$).

Conclusions: There is a significant relationship between task self-efficacy and objective measures of MVPA at the beginning and end of CR. As such, it is critical that task self-efficacy be targeted during CR to improve levels of MVPA. However, to better understand the impact of self-efficacy types along the recovery continuum further work is needed to examine whether or not task and barrier self-efficacy predict objective measures of MVPA following the completion of CR.

PO.174

Using objective assessment to determine eligibility to participate in a randomized controlled trial (The NewCOACH trial)

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: It is common to exclude participants who are already active from participation in trials of physical activity interventions in order to avoid a ceiling effect. Since self-report is commonly used for screening, but is prone to bias, the aim of this poster is to report the feasibility of using objectively assessed pedometry to identify insufficiently active patients to participate in a physical activity trial.

Methods: The aim of the NewCOACH trial is to determine the efficacy of referring insufficiently active primary care patients to counselling by exercise physiologists. To determine activity status, consenting patients wore a pedometer and completed a log sheet for 7 days. Patients were deemed insufficiently active (and therefore eligible to take part in study) if their mean daily step count was 7000 steps or less, after adjusting for wear time (>10 hours/day) and imputation of step counts for activities not captured by pedometry.

Results/findings: Of 355 patients who consented, 85% completed 7 days of pedometry and the log sheet, and 69% were deemed eligible. Objective eligibility screening added an additional 17 days to the study period. Compared with participants who were too active to participate, eligible participants were older (57 vs 53 years) and more likely to report at least one chronic illness (59% vs 46%), with higher rates of cardiovascular disease (16% vs 7%), diabetes (20% vs 10%), and cancer (5% vs 1%). The impact of changing the eligibility cut-point by ± 2000 steps (to 5000 or 10,000), would have changed the eligibility rate to 93% or 43% respectively. Practical challenges should be considered when introducing this type of objective screening. These include: the additional time required to recruit eligible participants, drop-out between consent and eligibility assessment, time delay between consent and intervention, participant difficulties with recording information related to step count, and interpreting what constitutes a full day of pedometer wear.

Conclusions: Researchers should consider the benefits and risks of objective screening for physical activity level before enrolling participants in a trial. The use of an objective cut-point can have a significant effect on the eligibility rate and should be considered in trial design.

PO.175

Physical activity patterns in children and adolescents with intellectual disabilities

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: To objectively assess habitual physical activity (PA) levels and PA patterns in youth with intellectual disabilities (ID).

Methods: This study was a cross-sectional design whereby PA was monitored for 7 days using accelerometers. Thirty eight participants (29 boys) aged 5-15 years from four schools in Merseyside, UK were included in the final analysis. Habitual PA and the number of continuous bouts accrued for a range of bout lengths (5-600 seconds) for light (LPA), moderate (MPA) and vigorous (VPA) intensity PA were calculated. Multivariate analysis of covariance was used to assess time spent in habitual PA and differences in the number of continuous PA bouts by sex, age, ID group and between week and weekend days for each duration.

Results: Habitual PA levels were low amongst boys and girls, only 23% of the sample met the current PA recommendations for health. Boys accrued more continuous 180s LPA and 15s MPA bouts than girls. The non-Autistic Spectrum Condition (ASC) group accumulated significantly more continuous LPA bouts lasting 5s, 10s, and 15s in comparison to the ASC group. Elementary school aged children accrued significantly fewer 180s continuous bouts of MPA than high school children. No participants engaged in any continuous bouts of PA at any intensity lasting 300s or more. Participants accrued significantly more 30s and 60s bouts of VPA on weekdays in comparison to weekend days.

Conclusions: Participants from this study engaged in low amount of PA and may be at risk of inactivity related ill health. The study demonstrates that children and adolescents with ID exhibit similar patterns of PA to their peers without ID. PA was accrued via short sporadic bursts of activity with the number of continuous bouts decreasing as the intensity and duration increased. Few differences in PA patterns were reported by sex, ID group, age group and between week and weekend days, possibly due to low PA levels within this population.

PO.176

Prevalence and correlates of non-surgical weight control attempts in adults: a systematic review

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Understanding how many weight loss efforts are made, by whom, through what means, and how successful they are, provides critical knowledge to inform public health interventions. This review will seek to answer these questions by determining the prevalence of weight control attempts and their success rates, identifying the related strategies and practices, and describing the reasons behind weight loss attempts among adult populations around the world.

Methods: Scientific articles were identified through electronic database searches (PubMed, PsycINFO and Web of Science) and also through manual cross-referencing of retrieved articles and hand-searches of key scientific journals. Search terms included attempts, weight control, weight loss, diet, prevalence, correlates, strategies, practices, reasons and determinants. Epidemiological/observational studies were eligible if they reported current weight control attempts in nationally or regionally representative samples of adults (18-65 yr).

Results: The search yielded 155 potentially relevant papers after title/abstract screening. After full-text screening, 51 studies met the eligibility criteria for entering the review. *The Joanna Briggs Institute data extraction form for prevalence and incidence studies* was used by the first two authors to extract relevant information, which will be included in summary tables. The same researchers are assessing study methodological quality using the *Joanna Briggs Institute critical appraisal checklist for studies reporting prevalence data*. Outcomes will be analyzed separately. Conclusions will be drawn based on a narrative synthesis of weight control attempts and related behaviors. If appropriate, meta-analytical techniques will be conducted.

Conclusions: Weight loss and/or preventing weight gain are a major concern for many people. As a result, systematically identifying and summarizing relevant information on weight control attempts and related behaviors across populations can contribute to more effective weight management practices, prevent psychological suffering associated with fruitless attempts, and allocate public health policies and resources more efficiently.

PO.177

ASSOCIATION BETWEEN MATERNAL STRESS, WORK STATUS, AND FEEDING PRACTICES AMONG PRESCHOOL CHILDREN

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The high prevalence of working mothers has coincided with increases in prevalence of child overweight. Although obesity is multifactorial, children may eat less healthy as a result of working parents and/or stress. The purpose of this study was to explore the relationship between stress and work status upon feeding practices among mothers of preschool-aged children.

Methods: This was a cross-sectional study of 285 mothers with children ages 2-5 years. Mothers completed an on-line survey, including maternal and child demographics; the Depression, Anxiety, Stress Scale (DASS)-21; and the Child Feeding Questionnaire (CFQ). Stress and work status (full time, part time, unemployed, student) were examined in relation to feeding practice factors (restriction, pressure to eat, monitoring) from the CFQ using linear regression and ANOVA for one selected child in the home between ages 2 and 5 years. Additional analyses were conducted to examine possible mediators using variables determined significant from the initial analysis.

Results: Mean age of mothers was 32.6 ± 5.2 years. 85% were married, 79% Caucasian, and 84% reported working full or part time. Working mothers spent 39.7 ± 12.0 hours/week at work. The selected child was 3.4 ± 1.0 years and 51% male. Stress was associated with the use of restrictive feeding practices (unstandardized $\beta = 0.017$, SE = 0.005, $p < 0.001$). Once adjusted for significant covariates, multivariable models confirmed maternal stress was associated with restriction, while accounting for child age (unstandardized $\beta = 0.101$, SE = 0.042, $p < 0.017$) and maternal concern for child's weight (unstandardized $\beta = 0.205$, SE = 0.050, $p < 0.000$). There were no differences in feeding practices by maternal work status.

Conclusions: Maternal stress was related to restriction, with further analyses confirming additional predictors of restriction, including child age (more restriction as child age increases) and concern for child's weight. Further exploration needs to determine these potential interrelated influences on child health, while also accounting for child characteristics that may impact feeding behaviors. Such information may help identify ways to reduce stress among mothers, thereby simultaneously improving maternal mental health and child feeding practices within the home.

PO.178

Validity of Vector Magnitude Thresholds for the Identification of Moderate and Vigorous Physical Activity using the ActiGraph wGT3X-BT.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objectives: Triaxial accelerometers have been developed to improve the accuracy of physical activity monitoring¹. These triaxial devices are capable of detecting acceleration (g) in three axes, which are summed together to produce a vector magnitude (VM)². To date, no thresholds to determine moderate physical activity (MPA) and vigorous physical activity (VPA) from the VM of the ActiGraph wGT3X-BT (AG) have been developed in adults. This study aimed to develop VM thresholds for determining MPA and VPA from the AG in an adult population.

Methods: Preliminary analysis from 21 participants (mean age 32.3, 11M/10F) who performed three activities of daily living and three ambulatory activities, while wearing an AG and a Cosmed K4B² metabolic unit, are presented. Receiver Operating Characteristics (ROC) curves and analysis were used to calculate an Area Under the Curve (AUC) to define thresholds with optimal sensitivity and specificity for MPA and VPA.

Results: The median accelerometer counts·15s⁻¹ and VM·15s⁻¹ are presented in Table 1. Using the accelerometer counts from the vertical axis, AUCs of 0.988 for MPA (>3 METs) and 0.999 for VPA (>6 METs) were revealed. For MPA, a threshold of 332 counts·15s⁻¹ optimized sensitivity (0.93) and specificity (0.93), while a threshold of 1106 counts·15s⁻¹ optimized sensitivity (0.97) and specificity (0.99) for VPA. Using VM, AUCs of 0.987 for MPA and 0.997 for VPA were revealed. For MPA, a threshold of 517 VM·15s⁻¹ optimized sensitivity (0.94) and specificity (0.94), while a threshold of 1163 VM·15s⁻¹ optimized sensitivity (0.97) and specificity (0.97) for VPA.

Conclusions: These findings identify count·15s⁻¹ and VM·15s⁻¹ thresholds with high levels of sensitivity and specificity for the estimation of MPA and VPA using the AG in adults. The use of these thresholds enables the assessment of the amount of time spent in MPA and VPA. Cross-validation of the count and VM thresholds will be necessary prior to implementation in field-based research, to confirm the accuracy of these thresholds³. These thresholds may not be suitable for activities, such as cycling, which may have high oxygen consumption, but relatively low count or VM values.

PO.180

The effect of interrupting prolonged sitting time with light intensity physical activity on metabolic parameters in young adults

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Recent literature shows that interrupting sedentary time may improve cardiometabolic health. However, it still remains unclear how interruptions in terms of duration, frequency and intensity must be designed to have a beneficial impact on cardiometabolic health. The purpose of the present study was to examine the effect of light intensity physical activity (LPA), with varying durations and frequencies, on the metabolic risk markers blood glucose, insulin and triglyceride.

Methods: Seven normal weight office workers (4 female, 3 male; mean age 26 years) were tested in three different testing conditions: 1) 8h sitting with a 30-minute walking break, 2) 8h sitting with 2x15-minute walking break 3) 8h sitting with 6x5-minute walking breaks. Walking was performed at a speed of 2 mph (=2.5 MET). Participants received two standardized meals for breakfast and lunch. Blood glucose, insulin and triglyceride were measured three times a day (8.00 am; 11.15 am; 3.30 pm). In addition, hourly blood glucose measurements were performed using portable blood glucose meters (TESTAmed®, GlucoCheck advance). Significant differences between the three testing conditions were tested by the Friedman-Test.

Results: Testing condition 3 showed the lowest levels regarding the recorded parameters blood glucose 85 (± 6) mg/dl and triglyceride 120 (± 75) mg/dl. However, no significant differences were observed between the different testing conditions: Insulin: p = .867; blood glucose: p = .104; triglyceride: p = .772.

Conclusion: The results of the pilot study differ from comparable examinations that confirmed the effect of LPA breaks on lowering metabolic risk markers. However, the results of the 6x5-minute walking break tended to show a positive influence. Regarding the participants the study design must be discussed concerning intensity, frequency and overall duration of physical activity. Further investigations with a larger sample size and a focus on higher frequencies of LPA and on intensity of breaks are necessary to get insight in the effects of interrupting prolonged sitting on metabolic parameters. In this regard it may be prudent to develop strategies aimed at substituting sitting time for LPA to improve metabolic health.

PO.181

Only leisure-time vigorous-intensity physical activity is associated with life satisfaction among university students

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The aim of this study was to examine the relationship between life satisfaction and (i) meeting the World Health Organization's (WHO) moderate to vigorous-intensity physical activity (PA) recommendations, (ii) total duration of PA, (iii) total volume of PA, (iv) domain-specific PA (occupational, transport-related, domestic, and leisure-time), (v) intensity-specific PA (walking, moderate- and vigorous-intensity), and (vi) 11 combined domain and intensity-specific PA types among university students. We hypothesized that life satisfaction is inversely related to occupational PA and positively related to all other PA variables.

Methods: Cross-sectional self-report data was collected among a random sample of 1750 university students in Zagreb, Croatia (response rate = 71.7%; 62.4% females; age range 18-30 years), using the long form of the International Physical Activity Questionnaire and the Satisfaction with Life Scale. The relationships between PA behaviour (independent variables) and life satisfaction (dependent variable) were assessed by six linear regression models, adjusted for gender, age, disposable income, size of community, body mass index, alcohol intake, smoking status, and self-rated health.

Results: The mean (\pm standard deviation) life satisfaction score was 17.9 ± 3.3 , that is, 64.5% of its maximum. Meeting the WHO's PA recommendations, total duration and volume of PA, domain-specific PA levels and intensity-specific PA levels were not significantly associated with life satisfaction. In the adjusted regression model, among 11 PA types, only leisure-time vigorous-intensity PA showed a significant relationship with life satisfaction ($\beta = 0.06$; $p = 0.045$). Participation in higher levels of leisure-time vigorous-intensity PA by 1 hour/day was associated with on average 0.49 points higher life satisfaction score.

Conclusions: These results do not support the utility of WHO's moderate to vigorous-intensity PA guidelines for increasing psychological well-being among university students. Promoting exclusively leisure-time vigorous-intensity seems to be a more promising approach to increase life satisfaction in this population. These findings also indicate the importance of analyzing domain and intensity-specific PA levels in future studies, as drawing conclusions about the relationship between PA and life satisfaction based on total PA levels only may be misleading.

PO.182

Effects of motivational components in a fall-reducing intervention on physical activity outcomes: Preliminary results

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SIG: Yes, Motivational Dynamics

Awards:

Objective: Knowledge about factors influencing motivation of older adults for physical activity (PA) has increased over the past several decades. However, intervention content supporting motivation has been integrated into few fall-reducing PA interventions. To address this gap, we are developing a new intervention (Ready-Steady) with three components: interpersonal motivational, intrapersonal motivational and physical (leg strength, balance, walking guided by the Otago Protocol). We assessed the impact of Ready-Steady's motivational components on PA.

Methods: One hundred and three community-dwelling older adults were randomized to one of four component combinations: (1) physical ($n = 25$); (2) physical and interpersonal motivational ($n = 26$); (3) physical and intrapersonal motivational ($n = 24$); (4) physical plus interpersonal and intrapersonal motivational ($n = 26$). Participants received comparable attention and Fitbit Ones. Measurement time points are one-week pre (T1), one-week post (T2) and six months post-intervention (T3). Total minutes of PA were measured via accelerometers (Fitbits) and self-report (CHAMPS). Effects of Ready-Steady's motivational components on change in PA from T1 to T2 was assessed using mixed ANOVA models.

Results: Participants were predominantly White (76%), women (73%) with a mean age of 79 ($SD = 7$). A significant Motivational Component \times Time effect was found for PA, measured via Fitbit Ones, $F(2, 93) = 7.372$, $p < .01$, such that participants who received the interpersonal motivational component increased their PA between T1 and T2 more than those who did not receive this motivational component. Respective changes in average minutes of daily PA (light, moderate, vigorous intensities included) were $+32.4$, 95% CI [17.8 - 47] and $+4$, 95% CI [-9 - 16.3]. Motivational Component \times Time interactive effects were not significant for PA, measured via CHAMPS. However, participants across all conditions reported increased PA between T1 and T2 (average change $+20$, 95% CI [8.5 - 41] minutes/day) as indicated by a main effect of time, $F(2, 97) = 9.16$, $p < .01$.

Conclusions: Findings provide initial support for the interpersonal motivational component in Ready-Steady. It will be important to test whether this pattern of results is observed 6 months after treatment.

PO.183

Dietary risk at 1-5 years of age is associated with child food neophobia and breastfeeding duration but not age of introduction to solids

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SIG: Yes, Early care and education

Awards:

Purpose:

Early feeding has the potential to contribute to development of inappropriate dietary patterns (dietary risk) in young children. Food neophobia also potentially reduces dietary variety and increases the vulnerability of young children to increased dietary risk. This study aimed to investigate associations between breast feeding duration, age of introduction to solids and child neophobia with dietary risk in young children.

Methods:

Cross-sectional data were obtained via an online questionnaire completed by parents of children (n=234) aged 1-5 years living in Australasia (n=159, 68%) and elsewhere (n=75, 32%). Dietary risk scores were calculated using a 19-item Toddler Dietary Questionnaire (TDQ, 1-3 years) or Preschool Dietary Questionnaire (PDQ, 3-5 years), which assess and evaluate the previous week's food-group intake against a scoring criteria (0 - 100; higher score = higher risk). The TDQ has previously been shown to have good reliability and comparative validity. Associations were investigated using multiple linear regression models, adjusting for covariates.

Results/findings:

Children (51% female, 3.0±1.4 years) were on average breastfed until 10.6±4.8 months and first given solids at 5.5±1.4 months of age. The average neophobia score was 2.2±0.5 (range 1=strongly disagree to 4=strongly agree). Shorter breastfeeding duration ($\beta=-4.50$; 95% CI -7.25, -1.74; $p\leq 0.01$) and higher child food neophobia score ($\beta=6.67$; 95% CI 4.35 - 8.98; $p<0.001$) were associated with higher dietary risk scores but age of introduction to solids was not ($p=0.52$). Child age ($\beta=0.13$; 95% CI 0.04, 0.22; $p\leq 0.01$) was directly associated, and parent education level inversely associated ($\beta=-3.46$; 95% CI -5.61, -1.30; $p=0.01$), with dietary risk scores.

Conclusions:

Young children's dietary risk is associated with the early feeding reinforcing the need to support parents in feeding their children in the first years of life to promote long-term health.

PO.184

WHAT INDIVIDUAL FACTORS ARE ASSOCIATED WITH MODERATE TO VIGOROUS PHYSICAL ACTIVITY AT BRAZILIAN SCHOOL TIME?

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 Federal University of Santa Catarina, Florianópolis, Santa Catarina, Brazil

SIG: Yes, Early care and education

Awards:

Purpose: This study investigated proportion of time spent in moderate to vigorous physical activity (%MVPA) in school break time and physical education (PE) classes and the associations with individual factors in Brazilian schoolchildren.

Methods: Thirty classes from second to fifth grades were selected from public schools of Florianópolis city to participate in the study, of which 13 (n=266; 45.9% boys) had attended to PE classes. Children wore Actigraph® GT3X+ accelerometers for two consecutive days in order to reduce reactivity. Time spent in MVPA during school break time and PE classes were calculated using Actilife 6.0 software, with 1s epochs and cut-points by Evenson et al. and transformed in %MVPA. Linear and multiple regression analysis were performed using %MVPA as outcome, and sex, grade, family income, school's economic region, mother's education and BMI z-score as independent variables.

Results: The schoolchildren spent an average 19.3% (95%CI: 17.6%; 20.9%) of the time in MVPA during the school break time, and 13.3% (95%CI: 12.3%; 14.3%) during the PE classes. Compared to boys, girls engaged in 6.2% less MVPA during school break time (Boys: 22.5%, 95%CI: 19.9%; 25.1%; girls: 16.3%, 95%CI: 14.4%; 18.3%) and 3.8% less during PE classes (Boys: 15.3%, 95%CI: 13.7%; 16.9%; girls: 11.5%, 95%CI: 10.4%; 12.6%). The school grade was a significant positive factor of %MVPA until the 4th grade on both, linear and multiple regression models to school break time and only on linear model to PE classes. The family income ranging from one to three minimal wages was a significant negative predictor of %MVPA on school break time and significant positive predictor of %MVPA on PE classes. The schools located in poor regions appeared as a significant negative factor of %MVPA on PE classes. Mother's education and BMI z-scores did not showed significant association with % MVPA in school break time and PE classes.

Conclusion: A number of individual variables were associated with %MVPA during school break time and PE classes. There is urgency to implement interventions to increase MVPA in Brazilian school time, especially to girls and low socioeconomic communities.

PO.185

Who do you turn to? Mapping employee social support for physical activity in an office-based workforce.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objectives:

In addition to the tangible benefits to business of reduced absenteeism and presenteeism associated with promoting physical activity (PA) has intangible benefits such as employee satisfaction and company reputation (van Dongen et al., 2011). Peer health champions have been incorporated into multilevel workplace health interventions (Linnan, Fisher, & Hood, 2013) but little is known about the mechanisms by which they facilitate behaviour change of their colleagues. Recruitment of peer champions has been based on personality and commitment to PA (Edmunds et al., 2013). The purpose of the current study is to map the natural sources of social support employees seek in relation to PA.

Methods:

Recruitment was from a public sector employer in the south of England, with approximately 600 office-based staff. Using an online survey 98 members of staff (40 males, 58 females; $M_{age} = 39 + 12$ years) reported their PA; named specific colleagues who provided 4 forms of social support for PA (emotional, informational, companionship, validation) and how frequently this support was sought. Social Network diagrams for each support network were visualised using Netdraw.

Results:

Of the employees who completed the survey, 21% (80% Females) did not meet PA recommendations whilst 11.76% (50% Females) were classified as exceeding recommendations (greater than 3000 MET min). Of the employees, 52% received at least 1 nomination (max nominations received by one employee was 20) of which 55% were female, the majority were meeting PA recommendations (72%) and educated to a graduate or postgraduate level. Employees who exceed PA recommendations were not those most frequently nominated (min=3, max=11). Companionship was identified as the most frequent source of support sought from fellow employees (99 instances), followed by informational (97 instances), encouragement (66 instances) and validation (43 instances). The densest network was for informational support, constituted largely of un-reciprocated connections. Support networks for encouragement and companionship revealed two groups linked via two individuals whilst others clustered in un-reciprocated pairs or triplets.

Conclusions:

By documenting the naturally occurring support networks within a company, the findings of this study will assist employers and researchers in devising selection criteria for employee PA champions in future interventions.

PO.186

Patterning of neighbourhood food outlets and associations with healthy eating among children: a latent class analysis

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The purpose of this study was to examine how different types of neighbourhood food outlets pattern in local neighbourhoods and to examine cross-sectional and longitudinal associations between these patterns and eating behaviours among children.

Methods: Parents of children aged 5-6 and 10-12 years ($n=801$) reported how frequently their child usually ate 14 fruits, 15 vegetables and 26 additional food items in the last week (eg. water, cheese, meat). Frequency of fruit intake was dichotomised at ≥ 2 and vegetable intake at ≥ 3 times/day and a diet quality index computed based on the Australian Recommended Food Score. Parents were followed up after three years (T2, $n=350$). A Geographic Information System was used to determine availability of the following food outlets within an 800m road network buffer: cafes/restaurant; fast food; major supermarket, small supermarkets/grocery store; convenience store; greengrocer; and butcher, seafood or poultry retailer. Latent Class Analyses were used to identify underlying classes of food outlet access. Linear and logistic regression were fitted to determine cross-sectional associations with the diet quality index and fruit and vegetable intake, respectively. Logistic regression was fitted to determine associations with fruit and vegetable intake at T2, adjusting for baseline. All analyses adjusted for maternal education and age and sex of the child, and accounted for unit of recruitment (schools).

Results: Three 'classes' of neighbourhoods were identified: 1) few outlets; 2) range of outlets, particularly cafes/restaurant and convenience store; and 3) range of outlets, particularly cafes/restaurant, major supermarket, greengrocer, convenience store and butcher, seafood or poultry. At baseline, 63% ate fruit ≥ 2 times/day, 46% ate vegetables ≥ 3 times/day and the mean diet quality score was 15.4 (SD=4.8). Neighbourhood class was not associated with dietary outcomes in cross-sectional analyses. Longitudinally, compared to neighbourhoods with few outlets, those living in neighbourhoods with high probabilities of a café/restaurant and convenience store being present had higher odds of eating fruit ≥ 2 times/day (OR=1.6, $p=0.043$) and lower odds of eating vegetables ≥ 3 times/day (OR=0.7, $p=0.047$) at T2.

Conclusions: Neighbourhood food outlets appear to pattern in different ways. However, associations with eating behaviours are complex and require further exploration.

PO.187

Correlates of Sedentary Behaviour in Older Adults: A longitudinal Study

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: This study used longitudinal data collected from free-living older adults (aged 65 years and over) to determinant the correlates and potential predictors of sedentary behaviour.

Methods: Demographic, physical health, functional ability, psychological health, physical activity and sedentary behaviour were assessed using self-report questionnaires. Physical activity was also objectively assessed over 7 days using a wrist-worn accelerometer (ActiGraph GT3X). A follow-up assessment (T1) was conducted six months after the baseline assessment (T0) with the agreement of participants. Factor analysis was performed to explore the health variables and generate a general health and well-being factor.

Results/findings: 44 participants with a mean age of 71.5 years completed both assessments. 25(58.6%) were female, 33(75%) were married, 32 (72.8%) lived with others, and 20 (46.3%) had a higher level of education. Participants self-reported a similar mean sitting time of 504 and 531 minutes/day at T0 and T1. But a significant difference was found in accelerometer-determined sedentary time between the two measurements (340 and 534 minutes/day at T0 and T1 respectively). There was a significant inverse correlation between the number of people living in the house with the participants and accelerometer-determined sedentary time at both T0 ($r=-0.34$, $p=0.014$) and T1 ($r=-0.50$, $p<0.01$). There were no significant correlations between self-reported general health and the overall well-being factor and sedentary behaviour. However, a moderate correlation was found between BMI ($r=0.37$, $p<0.01$), life satisfaction ($r=-0.34$, $p=0.01$) and self-reported physical activity ($r=-0.42$, $p<0.01$) with self-reported sedentary behaviour.

Conclusions: In free-living older adults, there was no association between general health, well-being and sedentary behaviour. The number of people in the household was inversely correlated with sedentary behaviour, suggesting a potential link between social interactions and sedentary behaviour. These findings should be confirmed in larger samples.

PO.188

The influence of dog ownership on the physical activity of older adults

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Dog owners (DOs) have been shown to engage in more walking and physical activity (PA) than non-dog owners (NDOs) in cross-sectional studies and using self-report measures. The aim of this study was to assess whether dog ownership influenced the PA of community dwelling older adults compared to NDOs, using a longitudinal design and an objective measure of PA.

Methods:

Pairs of community dwelling older adults (>65 years, one of whom owned a dog, matched for gender, age, socio-economic status and cat ownership) wore a waterproofed activPAL activity monitor, continuously for a week, three times over the course of a year. Outcome measures during self-reported waking hours were extracted, representing PA (time spent walking at a moderate cadence (≥ 100 steps/min), number of steps, time spent standing) and sedentary behaviour (time spent sitting, the number and duration of prolonged (≥ 30 min) sitting events). A linear mixed effects model with dog ownership as a fixed effect, and a random effects structure of measurement point nested in participant nested in pair was used to assess the effect of dog ownership on PA.

Results:

Participants ($n=86$) were mostly female (56%), aged 70 ± 4 years (range 65-81), with a BMI of 25.6 ± 3.6 kg.m⁻² (range 19.9-37.1). DOs walked for significantly longer at a moderate cadence (31 vs. 11 min/day, $p<0.001$) and took significantly more steps (9,700 vs. 7,200 steps/day, $p<0.001$) than NDOs. DOs also sat for significantly less time overall (9.4 vs. 10.1 hours/day, $p=0.002$) than NDOs. However, there were no significant differences between the ownership groups in either the number or duration of prolonged sitting events or in time spent standing.

Conclusions:

Results confirm previous studies where DOs reported more walking than NDOs, but also indicate that the additional walking of DOs was undertaken at a moderate cadence. On average, DOs met recommended public health guidelines (30 min/day of moderate PA), but NDOs did not. Owning a dog, may therefore motivate older adults to engage in appropriate levels of PA for health, and it is possible that encouraging appropriate dog ownership, or shared care of a dog, could be used to promote PA in older adults.

PO.189

Measuring Implicit Attitudes for Exercise in Older Adults with Chronic Lung Diseases: A Feasibility Study

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Implicit social cognitions have been shown to predict behaviour over and above explicit social cognitions. This research is the first to examine the suitability of an implicit attitude measure, the Go/No-go Association Task (GNAT), for older adults with chronic lung diseases. The GNAT is a paced computer response task, with typical response deadlines between 500 and 1000 milliseconds (ms), which may be too fast for older adults. This research aims to determine the feasibility of the GNAT as an effective measurement of implicit attitudes for exercise in older adults with chronic lung diseases.

Methods: Sixteen regular exercisers who graduated from a pulmonary rehabilitation program (*Age*=72) completed the GNAT and a questionnaire measuring outcome expectations for exercise. The response deadline was 1000ms for half of the participants and 1500ms for the other half. Error rates and response times were examined and compared across response deadlines. Repeated measures ANOVAs determined if response times differed for exercise-desirable and exercise-undesirable trials, with faster responses indicative of stronger implicit attitudes. The correlations among implicit attitudes for exercise to enjoyment, health, and appearance outcome expectations for exercise were examined.

Results: Participants with the 1000ms response deadline timed out more frequently and were less able to inhibit responses on the no-go trials (i.e., where correct response is no response) than participants with the 1500ms response deadline. A trend towards positive implicit attitudes for exercise was found for the 1500ms response deadline, $p = .06$, $\eta_p^2 = .41$. No effect of implicit attitudes was found for the 1000ms response deadline, $p = .46$, $\eta_p^2 = .07$. Implicit attitudes were correlated to the likelihood and desirability of enjoyment, health, and appearance outcomes (r 's .30 to .77).

Conclusions: The 1000ms response deadline did not allow for assessment of implicit attitudes in this sample. Less timing out during response periods, better response inhibition, and generation of viable implicit attitude scores suggests the 1500ms response deadline is more suitable than the 1000ms response deadline in older people with chronic lung diseases. This study provides a platform for future research to examine the impact of implicit attitudes on exercise behaviours in older adults.

PO.190

The impacts of a computer-assisted school-based nutrition intervention on the consumption of vegetables, fruits, and dairy products in adolescents.

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: To evaluate the impacts of the Team Nutriathlon, a computer-assisted school-based nutrition intervention, on the consumption of vegetables, and fruits (V/F), and dairy products (DP) in high school students. To the best of our knowledge, few studies have investigated the impact of a computerized program on eating habits in adolescents.

Methods: This study used a quasi-experimental approach whereby classes from three different schools were randomly assigned to either the intervention group ($n=193$; girls=63%) or the control group ($n=89$; girls=58%). Briefly, the Team Nutriathlon aimed to develop participants' autonomy regarding their food choices following a gradual adoption and maintenance of healthy eating habits. In this study, Team Nutriathlon was implemented using a computer-based software platform over a 6-week period. During this period, students were encouraged to reach individual and team goals regarding the amount and variety of V/F and DP consumption. They also had to record their daily V/F and DP consumption (5 days/week) in order to analyze their behaviors and identify strategies that could help them to reach the program goals. The control group attended the regular school program without any intervention. The main outcomes were daily servings of V/F and DP, which were compared between groups at five time points: at baseline (week 0), during the intervention (weeks 3 and 5), as well as immediately after the intervention and at follow-up (10 weeks later). Manova for repeated measures were used to assess changes in mean daily servings over time between groups.

Results: During the intervention, as well as immediately after and at follow-up, participants in the intervention group consumed more servings of V/F and DP compared to the control group (group x time, $p < 0.0001$). Students in the intervention group reported consuming 37% and 50% more portions of V/F and DP respectively during the Team Nutriathlon compared to the control group. Gender did not influence the results.

Conclusion: Findings of this study suggest that the Team Nutriathlon represents an innovative computer-assisted school-based nutrition intervention that can help adolescents to increase their V/F and DP consumption, at least in the short term.

PO.191

The effect of brisk walking intervention in older woman with sedentary occupation: A randomized controlled trial

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Palacký University in Olomouc, Olomouc, Czech Republic

SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The purpose of the study was to assess the effect of regular walking to/from work in elderly women with sedentary occupation. In the study, four hypotheses was verified: Regular walking to/from work 1) decreases body weight, 2) decreases fat mass, 3) increases the level of postural stability, and 4) increases the bilateral isokinetic strength in the knee joint extensors. This research is innovatively based on utilization of workplace accessibility and environment walkability as opportunity to enhance physical activity.

Methods: 131 females from 21 Czech worksites (based within 5 organizations) were recruited to randomized controlled trial (German Clinical Trials Register: DRKS00007638), consequently randomized into the intervention and control group. The intervention (based on the Transtheoretical and Ecological model of behaviour change) consisted of brisk walking to/from work of 30-35 minutes five times a week (BWI) (besides the habitual physical activity). The length of the intervention was set to 10 weeks. Body weight, fat mass (percentage of the fat mass and visceral fat), postural stability (an average speed of centre of pressure (COP) in medial-lateral and antero-posterior direction), and strength in the knee joint extensors (an absolute concentric peak torque and an average work) were measured at baseline and after BWI was finished (i.e. the 11th week). Devices InBody 720, Kistler force plate, and IsoMed 2000 dynamometer were used for data collection. To verify the hypotheses two-way repeated-measures ANOVA concurrently with Fisher's LSD post-hoc test (body composition, postural stability) and the Wilcoxon concurrently with Mann-Whitney U test (the rest of variables) were applied ($p=0.01$).

Results: In total, 104 participants (mean age 56.6 ± 4.8 years) completed the study. Throughout BWI females performed in average 4301 ± 851 steps/day (39% of daily number of steps). The intervention was not successful except the average speed of COP in antero-posterior direction ($F=7.41$, $p=0.008$).

Conclusions: The study shows that model including BWI is well practicable in the cities with a walking-friendly environment. Positive effect of BWI lasting 10 weeks was only in a parameter of postural stability but the results indicate that positive changes in observed variables could be obtained by extension of intervention duration.

PO.192

Dietary Intake and Compliance with Nutrition Guidelines Among Cancer Survivors

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Among cancer survivors, a nutritious diet and healthy weight management are particularly important to preventing recurrence, second primary cancers, chronic disease, and decreasing mortality. The purpose of this study is to examine racial and ethnic differences in fruits and vegetables, fiber, and alcohol intake and compliance with the American Cancer Society (ACS) guidelines for cancer survivors.

Methods: Using the 2010 National Health Interview Survey (NHIS) Cancer Control Module, we analyzed racial and ethnic differences among 1,422 cancer survivors in average daily intake of fruits and vegetables, fiber, and alcohol. The NHIS is a cross-sectional health survey that is conducted by the National Center for Health Statistics (NCHS) and the Centers for Disease Control and Prevention. Dietary intake, height and weight were assessed by questionnaires and BMI (kg/m^2) was calculated. Results were analyzed using means, ANOVA and multiple logistic regression with SAS version 9.3.

Results: There were significant differences in mean BMI ($p=0.002$), mean daily intake of fiber ($p=0.001$) and alcohol ($p<.0001$), between race and ethnic groups. No significant differences were found for mean intake of fruits and vegetables; however, Hispanics had the highest intake of 2.75 cups compared to 2.51 among NHBs. Hispanics had the highest mean intake of fiber (16.8 gm.) compared to NHWs (15.1 gm.) and NHBs (13.8 gm.). Hispanics also had the lowest mean intake of alcohol (0.14 drinks/day) and NHWs had the highest intake (0.42 drinks/day). Although not significant, mean intake of fruits/vegetables decreased with increasing BMI among all groups.

No significant racial differences were found for fruit and vegetable guideline compliance. After adjustment, Hispanics were 2.90 times more likely to comply with fiber guidelines than NHWs ($p\text{-value}=0.029$). Hispanics and NHBs were 9.27 and 2.81 times more likely, respectively, to comply with alcohol guidelines compared to NHWs. Determinants of compliance included gender, age, employment.

Conclusions: These results indicate that there are racial and ethnic differences for intakes of fruits and vegetables, fiber and alcohol among cancer survivors. Compliance to nutrition guidelines also varied by race and ethnicity. These findings could indicate the potential for culturally tailored clinical and public health nutrition intervention among cancer survivors.

PO.193

Affordances for Risky Play in Natural Parks and Physical Activity among Children and Adolescents

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SIG: Yes, Children and families

Awards:

Purpose: The risks and benefits in children's risky play has been a debated issue in the last two decades. A growing concern about safety contributed to limit children's access to risky outdoor play opportunities. The purpose of this study was to examine the associations among risky play behaviours and environments and children's and adolescent's park-based physical activity.

Methods: Data were collected during summer 2014 on 18 272 children in 6 natural parks in Quebec, Canada. Each park was observed 50 hours using a modified version of the System of Observing Play and Recreation in Natural Areas (SOPARNA), measuring risky play behaviours according to Sandseter's categories. This new tool was used for the first time with this population. Hierarchic regression analysis assessed associations between individual and park characteristics in terms of risky play and children's park-based physical activity.

Results:

Of the 18 272 children and youths observed, 41% and 35.4% were respectively engaged in risky play representing moderate and vigorous physical activity levels. Higher level of physical active risky play was negatively associated with gender (girls); an interaction involving the 0-5 years age group and style of play in play spaces which afforded to climb and jump from a surface; an interaction involving the 6-12 years age group and formality of supervision in trails affording high speed to chase and catch and rough-and-tumble play with detached natural material (e.g., fencing with fallen branches); and environments allowing for high speed in mountain biking trails and great heights in aerial hebertism trails for the 13-18 years age group.

Conclusions: Natural parks with trails and natural affordances attracted children and youths and allowed for thrilling forms of play that stimulated physical activity. Interventions should address the formality of supervision in order to promote a more balanced approach to risky play with children.

PO.194

The influence of physical activity level, the participation in organized physical activities and the overweight like predictors of motor skills at the school age.

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SIG: Yes, Policies and environments

Awards:

Objective: The aim of this study was to analyze whether the physical activity level, the participation in organized physical activities and the overweight in preschool age, as well as if the change in these factors in the transition from the preschool to the school age, are predictors of motor skills at the school age.

Methods: The sample was comprised by 665 children selected in 28 preschools collected at baseline in 2010 and collected again after two years in the city of Recife, Pernambuco, Brazil. The outcome was the motor coordination performance was derived from a gross motor quotient (QM) obtained for each one of the following four tests: walking backwards, one-legged hopping, jumping sideways, and moving sideways. Afterwards, the QM scores were classified in three categories (low, intermediate, high) by considering as cutoff points the tertiles by gender and age for each QM score. The exposures were the physical activity level, participation in structured physical activity and overweight. The ordinal logistic regression with proportional odds model was performed to examine the association between the exposures with motor skills performance.

Results: It was found that the overweight in preschool age was significantly associated with motor skills levels at school age (OR = 2.61; 95% CI: 1.85 to 3.69; p < 0.001). After stratification by level of physical activity, it was observed that the magnitude of association between overweight and increased motor skills level was higher for preschool children with lower levels of physical activity (OR = 4.04; 95% CI: 1.96 - 8.33, p < 0.001) compared to those considered physically active (OR = 2.30; 95% CI: 1.53 to 3.46; p < 0.001).

Conclusions: The results of this study shows that: the overweight at preschool age was a predictor of motor skills at school age; the change in overweight occurred in the transition from preschool to school age predicts motor skills at school age; the level of physical activity in preschool moderates the association between overweight and motor skills performance; the physical activity at preschool age do not predict motor skills at school age.

P1.1

The Fake Food Buffet 2.0: Studying food selection for the entire day

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SIG: No, this does not fit in any of the special interest groups

Awards: Yes, for the Early Career Award

Objective:

Investigating people's food behaviour presents a methodological challenge due to practical limitations such as the high levels of effort and cost of food preparation. Therefore, behavioural nutrition has mostly been investigated using single food components. Further, studies were often conducted in unstandardized environments, and participants were frequently tested in groups. The fake food buffet (FFB) method was developed to investigate food choice behaviour under well-controlled environmental conditions. It contains a variety of food replicates from which consumers are invited to choose meals. The method was validated and has been widely used for various food choice studies. However, the current FFB has some important limitations, as it contains a high proportion of healthy foods and provides a limited selection of foods suitable for lunch. The aim of the present study is the development of an extended version of the FFB that enables investigating dietary choices for an entire day.

Methods:

The new Fake Food Buffet 2.0 contains 159 food items representing a broad variety of foods typically consumed throughout the day. The food selection is balanced according to the food's healthiness based on nutrient profiles. The new buffet contains a variety of snack and convenience foods, beverages and sauces to better represent a common diet. Nutrient profiles of corresponding real foods were calculated for all items, allowing experimenters to estimate energy and nutrient intakes.

Results:

The novel features and applications of the FFB 2.0 will be discussed, and experimental data from a study on the influence of nutrition knowledge on food choice will be presented as an example for the research potential of the FFB 2.0.

Conclusions:

To gain a better understanding of people's eating behaviour and corresponding factors, reliable methods to investigate nutritional behaviour are required. The Fake Food Buffet 2.0 is an improvement in comparison to the previous buffet, in that it extends the potential applications for a broad variety of research designs.

P1.2

School Meals Policy in Perspective: Assessing the impact of legislation on child malnourishment from 1908 to 2010

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SIG: Yes, Policies and environments

Awards: No

Purpose: According to government papers, during the Boer War from 1899 to 1902 over 60% of recruits to the Army were rejected due to their poor physical health as a result of malnutrition. The Physical Deterioration Committee was set up to investigate the health of the population and make recommendations to reverse this worrying trend. The Committee's 1905 report highlighted that poorer children were shorter and underweight compared to their more affluent peers and recommended feeding children in schools. As a result, the 1906 (Provision of Meals) Act was introduced which allowed Local Education Authorities to provide meals to children in school. This paper analyses whether UK government policies relating to school meals have, since their introduction, had a genuine impact on observed, longitudinal changes in childhood nutrition.

Methods: Mixed methods combining qualitative grey literature searches for government documents with quantitative analysis of a series of cross-sectional data for children's heights and weight collected in the UK from 1908 to 2010. These data were assessed in order to estimate average changes in malnutrition (including underweight, overweight, and obesity) for UK children which was then mapped against school meal legislative changes to understand whether policy has impacted child growth.

Results: Government legislation for school meals has fluctuated from a permissive to mandatory requirement since the introduction of the 1906 Act, with nutritional standards only becoming mandatory in 1998 and implemented from 2001. Results highlighted potential areas for more in-depth investigation, such as the perceived removal of nutritional standards by the 1980 Education Act and the increase in overweight and obesity shortly afterwards. However, there were also clear indications that other sociological phenomena could be attributed to fluctuations in childhood nutrition, such as World War I and II.

Conclusions: This study suggests there is limited evidence to directly attribute changes in childhood malnourishment to alterations in government legislation. However, the school meal is generally accepted as forming part of the welfare system in the UK. This study argues that any beneficial effects from school meals can be reversed if the meal is not protected from wider governmental welfare reforms.

P1.3

Food based or nutrient based standards for British children's school packed lunches?Charlotte Evans*School of Food Science and Nutrition, University of Leeds, Leeds, UK***SIG:** Yes, Policies and environments**Awards:** No

Purpose: In the UK, standards for school meals include 8 food based standards and 13 nutrient based standards. These standards are legally binding for many but not all schools in England. Ensuring that meals meet all the nutrient standards is onerous for school catering staff. The School Food Plan, published in 2013, provides guidance for school and concentrates mainly on food rather than nutrient based standards. Policies for packed lunches provided at home are also mainly food based. However, there is a concern that solely using food based standards may not be as good a predictor of a high quality meal as the use of nutrients. Identification of the most important markers of a high quality lunch is useful for school policy makers.

Methods: Cross sectional dietary data from 1294 British children in 89 schools, aged 6 to 8 years taking a packed lunch to school was used in the analysis. A measure of dietary quality of each lunch was calculated based on the total number of standards met out of a total of 21. Multilevel regression analysis taking into account the clustering of children within schools was carried out to determine the foods and nutrients significantly contributing to the variation in dietary quality.

Results: The optimal model included all 8 foods and 7 of the 13 nutrients (protein, saturated fat, iron, vitamin C, folate, calcium and sodium) and explained 73% of the variation in dietary quality. The remaining 6 nutrients (carbohydrate, sugars, total fat, fibre, vitamin A and zinc) were not statistically significant predictors of dietary quality when foods were included in the model. The two most important nutrients in conjunction with foods were iron and vitamin C which together with the 8 food groups explained 69% of total variation in dietary quality. Addition of the remaining 4 nutrients resulted in small although significant improvements in the model.

Conclusions: Policy makers reviewing policies for school packed lunches should consider using food based standards plus recommendations on a small number of nutrients such as iron and vitamin C in order to help ensure provision of high quality packed lunches.

P1.4

Barriers to Healthy Dietary Choice Amongst Secondary School Students in rural Sri Lanka

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SIG: No, this communication does not fit in any of the SIGs**Awards:** No**Purpose:**

To investigate perceived barriers to healthy dietary choice among secondary school students in rural areas of Sri Lanka, within a socio-ecological framework. Sri Lanka has experienced a massive demographic, environmental, economic and social transition in recent decades. Over this period of time the country has undergone rapid urbanisation leading to accompanying shifts in lifestyle and it suffers a double burden of under- and over-nutrition. Current programmes in the country focus on improving the dietary behaviour of secondary school students. In order to do this we must first understand the barriers to healthy dietary choice that this section of the population faces.

Methods:

Focus groups (n=11) investigating the barriers to healthy dietary choice amongst students were conducted with secondary school principals in Moneragala (n = 29 principals) and Ampara (n = 26 principals), two ethnically diverse rural districts of Sri Lanka. These were carried out and transcribed in Sinhalese (n=10) and Tamil (n=1) and then translated into English for content and thematic analysis, based on a socio-ecological framework. Principals are well-respected members of the community who are central to school approaches to improve the dietary behavior of students and community function in general, they therefore have a broad-based view of what local, regional and national barriers to dietary choice are present.

Results:

Principals identified a number of barriers to healthy dietary choice by students, which could be found at a number of levels of influence of a socio-ecological framework: 1) structural level barriers included educational and agricultural policies, 2) living and working level barriers included employment opportunities and local food production, 3) social and community level barriers included traditions and social/cultural beliefs, and 4) individual level barriers included knowledge and preference.

Conclusions and Implications:

The barriers to healthy dietary choice amongst secondary school students in Sri Lanka are varied, supporting the use of multifactorial programmes to promote healthy eating. Only from understanding these barriers and finding ways to counter them can we hope to reduce the double burden of under- and over-nutrition the country is currently suffering.

P1.5

Using the e.button for measuring dietary intake in children: A formative study

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SIG: Yes, e- & mHealth

Awards: No

Purpose:

Dietary assessment is fraught with error among adults, and especially among children. Even though 24 hour dietary recalls are considered the preferred method of diet assessment, as much as 50% of the child reported foods have been errors as assessed against observation of consumption the previous day. Innovative technology may provide the new methods needed to provide more accurate assessments of dietary intake. This study reports qualitative data on the circumstances within which children would wear, and parents would let them wear, an e.button; aspects of how best to obtain the pictures among smaller people; and the accuracy of portion estimation against known amounts served.

Methods:

The sample consisted of 21 8-13 year old children and their parents, recruited via telephone from the Children's Nutrition Research Center's (CNRC) volunteer participant database. These data were collected at the CNRC. Observational and interview methods assessed how best to attach/connect the e.button to the child; acceptable size of the e.button; levels and angles for measuring food intake; and concerns about wearing an all day camera. All foods served were pre-portioned and weighed. Two dietitians independently used the mesh procedure for assessing portion size and estimating nutrients using FNDDS.

Results:

Children and parents generally preferred the heavier camera with the largest battery to minimize complications from having to change the instrument midday in all-day assessments. Each child will need to self select an e.button cover to meet their own tastes. Precise heights and hanging angles are needed to capture foods on plates in front of the child. The wire mesh procedure proved challenging, but reasonable inter-observer reliability and validity against known values of portion size and nutrient estimation were obtained.

Discussion:

Procedures have been identified to enable the e.button to be operational among children. We are now ready for field tests with the e.button worn at home and in school.

P1.7

Effect of a free healthy school meal. Results from a one year intervention study among 10-12 year olds in Southern Norway.

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 University of Agder, Kristiansand, Norway

SIG: Yes, Policies and environments

Awards: No

Background/Purpose:

In Norway there is no school meal program (e.g. school canteens) in schools, and the general rule is that the pupils bring a packed lunch (e.g. sandwich) from home. Reports show that there are large differences in what degree the pupils bring a healthy school lunch or not. Also some pupils do not bring any lunch. There are currently few projects in Norway evaluating the effectiveness of promoting healthier eating among young people by serving a healthy school meal over an extended period of time, and therefore there is a need to develop effective local level actions at schools. The aims of this intervention are to evaluate whether serving of a free healthy school lunch in one year affect the learning environment, motivation for learning, food habits at school and home and weight status among pupils in Southern Norway; 10-12 years old.

Participants and setting:

Pupils, aged 10 to 12 years, from twelve school classes in Aust-Agder county in Southern Norway (two schools), were invited to participate in the study. 200 pupils (with parental consent) participated and 150 of their parents.

Data collection:

The study was designed as a school intervention study with a control group. The study period was one school year. The intervention group consisted of 60 children receiving a free school meal and 140 children in the control group. Prior to the intervention (baseline, August 2014), all children answered a questionnaire about their consumption of food during the school day (including fruit and vegetables), physical activity habits, sedentary behaviors and the perceived learning environment and motivation for learning. Height, weight and waist circumference of the children were also measured. The parents answered a short questionnaire about their own eating habits. Follow-up 1 in January 2015, and follow-up 2 in June 2015.

Results:

Findings from baseline and follow-up 1 will be presented.

P1.8

Food'n Fruit - Promoting Healthier Eating at School

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SIG: Yes, Early care and education

Awards: No

Effect on attention of a vegetable smoothie, rich in berries, fruits and vegetables, served at the school mid-morning break. Viktoria Ohlsson. Kristianstad University

Purpose:

The purpose of this pilot study was to investigate effect on attention of a vegetable smoothie, rich in berries, fruits and vegetables, served at the mid-morning break. The smoothie was designed to provide only 5% of the daily energy. The effect was assessed by the D2-test of attention.

Participants and setting:

Pupils, aged 10 to 12 years, from twelve school classes in southern Sweden, were invited to participate in the study. In total 250 children participated. Children suffering from serious food allergies or food intolerance were excluded from the study.

Data collection:

The study was designed as a cross-over trial with two study periods of ten schooldays. The children were randomly divided into two groups and were administered either an active smoothie (smoothie 1; group A) or a fruit-based placebo with the same energy content (smoothie 2; group B). After a three week wash-out period, group A was administered smoothie 2 and group B, smoothie 1.

Prior to the study, all children answered a questionnaire about their consumption of fruit, berries and vegetables, physical activity habit and their perceived hunger during the school day. Age, height and weight was also recorded.

Data analysis:

Analysis of the data focused on concentration performance as assessed by the D2-test.

Findings:

Conclusion:

P1.9

Type D personality and unhealthy dietary intake: The mediating effects of coping style

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Several personality characteristics have been associated with eating behaviours. For example, conscientiousness is associated with eating a healthy diet. Another personality construct that has been linked to various health outcomes is Type D personality. Type D refers to the synergistic effect of negative affectivity and social inhibition. It has been associated with poor health outcomes in cardiac patients and a range of unhealthy behaviours, including lower levels of physical activity and increased alcohol consumption. However, to-date no study has specifically examined the relationship between Type D personality and dietary intake. Therefore, the aim of the current study was to examine the relationship between Type D and dietary intake, and to examine if this relationship is mediated by coping style.

Methods: In a cross-sectional study, 187 participants (13 females, 57 males, mean age 21.4 years) completed self-report measures of Type D personality (DS14; Denollet, 2005), coping style (Brief COPE; Carver, 1997), and dietary intake via a food frequency questionnaire.

Results: An independent-samples t-test showed that Type D individuals ($M = 53.49$, $SD = 9.73$) scored significantly lower than non-Type D individuals ($M = 59.54$, $SD = 10.02$) on healthy eating behaviour ($t(185) = 4.14$, $p < .001$). Specifically, it was found that Type D individuals consume significantly more fat and sugar than non-Type D individuals, and significantly less fruit and vegetables. In addition, when considering Type D as a continuous variable it was found that there was a medium, negative correlation between Type D and dietary intake ($r = -.313$, $n = 187$, $p < .001$), with higher levels of healthy eating associated with lower scores on the dimensional Type D construct. Formal mediation analysis revealed that coping style partially mediates the relationship between Type D and dietary intake.

Conclusions: We found that Type D personality was associated with unhealthy dietary intake and that this relationship is partially mediated by dysfunctional coping styles. These findings could have implications for the consideration of personality factors when designing dietary interventions, as Type D individuals may represent a group that is at-risk of unhealthy eating patterns.

P1.10

Teaching healthy eating to elementary school students: A scoping review of nutrition education resources

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SIG: Yes, Policies and environments

Awards: No

Purpose: School-based programs represent an ideal setting to enhance healthy eating, as most children attend school regularly and consume at least one meal and a number of snacks at school each day. However, current research reports that elementary school teachers often display low levels of nutritional knowledge, self-efficacy and skills to effectively deliver nutrition education. The purpose of this scoping review was to better understand the availability and quality of resources that are accessible for elementary school teachers to use to support curriculum delivery or nutrition education programs.

Methods: A systematic review and meta-analyses was conducted in 2014 (Dudley, Cotton & Peralta), with this scoping review using this search strategy as a basis. Electronic bibliographic databases included PUBMED, MEDLINE, the Cochrane Central Register of Controlled Trials (CENTRAL), PsycINFO, ERIC, ScienceDirect, and A+Education. We sought to find resources that were used and measured as part of elementary school interventions. For additional resources, a similar approach (as described above) was used in Google rather than a journal database, and health or public health organisations were entered into the Google search engine and organisation websites were scanned for relevant resources (e.g., Centers for Disease Control and Prevention [CDC]). The review included 32 resources in the final analysis from 1989 to May, 2014, with these resources accessible in four countries.

Findings: The 32 resources exhibited eight dominant teaching strategies: curriculum approaches; cross-curricular approaches; parental involvement; experiential learning approaches; contingent reinforcement approaches; literary abstraction approaches; games-based approaches; and web-based approaches. The resources were accessible to elementary school teachers, with all of the resources embedding curriculum approaches, and most of the resources embedding parental involvement strategies. Resources were less likely to embed cross-curricular and experiential learning approaches, despite recent research suggesting that the most effective evidence-based strategies for improving healthy eating in elementary school children are these two approaches.

Conclusions: This scoping review suggests that future resources need to use a whole school approach, with curriculum, school environment and parental involvement strategies, as this is the most appropriate and effective method for improving healthy eating of elementary school children.

P1.11

Relationship of eating competence to food and eating behaviors in a predominantly Hispanic sample of 4th grade parents is confirmed in a predominantly non-Hispanic white sample of 4th grade parents.

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SIG: Yes, Children and families

Awards: No

Purpose: Eating competence (EC) was associated with parent practices supportive of child obesity prevention in a mostly Hispanic sample. This study sought to confirm findings in a mostly non-Hispanic white sample.

Methods: Data were collected at baseline from 2 cohorts of parents in consecutive years whose 4th grade children participated in a classroom-based cooking program. Parents (n=215) responded to an online survey that included the Satter Eating Competence Inventory 2.0 (ecSI 2.0), fruit and vegetable-based modeling practices, self-efficacy/outcome expectancy (SE/OE) and fruit/vegetable availability (FVA) in the home; height/weight were self-reported. Survey response options were summed for analyses that included correlation, means testing, and cluster analysis.

Results: Parents were mostly non-Hispanic white (91%), female (87%), college educated (66%), with a mean age of 39.6 ± 5.9 y; only 18% were obese. 54% were eating competent (EC) (ecSI 2.0 score ≥ 32); mean ecSI 2.0 score of 31.8 ± 8.0 did not differ by gender. Past or current nutrition assistance program use was 17% SNAP, 21% WIC, 15% food banks. Although healthy, 20% self-identified as under extreme stress and 50% had either used a nutrition assistance program or worried about money for food. EC parents had greater FVA (12.3 ± 2.5 vs 11.5 ± 2.8, P=0.04). SE/OE was significantly higher in EC parents (55.0 ± 6.5 vs 52.3 ± 8.4, P=0.013). EC parents more strongly agreed that they could buy and serve vegetables that their child would eat (all P < 0.04). Parent modeling of obesity preventive eating behaviors was significantly greater in EC than non-EC parents (P<0.001). EC parents were more likely to eat dinner and include vegetables with meals (all P < 0.03). Cluster analysis identified 2 clusters—Achievers (n=155) and Strivers (n=53). Achievers demonstrated greater food resource management skills (e.g., planning meals, comparing prices, money management confidence, considering nutrition in purchases; all P ≤ 0.03). Achiever ecSI 2.0 scores were significantly higher (33.2 ± 7.1 vs 27.8 ± 8.5; P<0.001).

Conclusions: Association of EC with obesity preventive food related practices in both Hispanic and non-Hispanic white parents endorses parent nutrition education focused on EC concepts. Funding by USDA AFRI.

P1.12

Formative research to develop a web-based, worksite intervention to promote the Mediterranean diet in South-West England

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The need to promote the Mediterranean diet (MD) to non-Mediterranean populations has been recognised but no such intervention has been conducted in England. Web-based, worksite interventions can be effective in promoting the MD since they offer reach to large adult populations. This formative work aimed to inform a feasibility trial according to the UK Medical Research Council's guidelines on developing complex interventions. We aimed to assess MD adherence among employees in South-West England, and examine their perceptions of ability to follow the MD, preferences for 'MD goal' setting and expectations of a website promoting the MD.

Methods: A cross-sectional survey was conducted among 590 employees in four worksites (428 women, 162 men, mean age 43.8y). MD adherence was assessed using a validated food frequency questionnaire. A composite MD score was calculated, based on the consumption of eleven MD components. Semi-structured focus groups were conducted with 29 participants (14 men, 15 women) and analysed thematically using the grounded theory framework.

Results: Participants reported moderate adherence to the MD. Higher adherence was reported for vegetables, cereals and fruit. Few participants achieved high adherence to the Mediterranean diet recommendations for legumes (5.3%), fish (3.2%), dairy products (4.8%), red meat (11.9%), poultry (11.1%) and olive oil (18.2%). Main barriers to adopting the MD were cost and lack of cooking skills. Setting goals with assistance from a health professional, reviewing and receiving feedback on goal achievement through a website/mobile application combined with the option for personal counselling through a forum and keeping a flexible/tailored approach to goal setting appeared to be important facilitators to adopt the MD. Most participants perceived that a website containing interactive features, recipes/cooking demonstrations, cost-saving shopping tips, discussion forums, and high-quality, supportive content, while emphasising the benefits of the MD, would be effective in facilitating MD adoption.

Conclusions: Improvement in the consumption of several components of the MD is needed to increase MD adherence in this population. Addressing perceived barriers and benefits to MD adoption, tailored goal setting and supportive, high-quality website content should be key components of a web-based intervention to promote the MD in worksites in South-West England.

P1.13

Linking together the home food environment and dietary intake among rural adolescents

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Home availability of certain foods may to influence dietary consumption among adolescents. Additionally, the types of foods parents purchase may bridge home food availability and consumption patterns. To these ends the aims of this study were to 1) determine the association between adolescent self-reported home availability of food and dietary intake; and 2) determine the association between parental purchasing habits and dietary intake among adolescents

Methods: US adolescents, ages 13-18, and their primary caregiver who conducted at least 25% of the food shopping were recruited to participate in a cross-sectional survey in four counties (2 in Kentucky, 2 in Ohio) during the fall of 2013 to measure home food availability, food store purchases, and dietary intake (n=54).

Results: There were significant differences between self-reported home availability of fruit juice and soda pop among adolescents (p=0.02). Adolescents who reported that fruits and vegetables were available in the home consumed less added sugars (-6.95 grams 95% CI [-13.84, -0.07]). Adolescents who reported having "junk food" including more salty snacks, chocolate or other candy, and soda pop in the home consumed more added sugars (6.84 grams 95% CI [2.37-11.32]) Parents who reported purchasing potato chips and other salty snacks had adolescents that consumed fewer mg of calcium (-561.32 mg [95% CI -983.04, -139.61]).

Conclusion: Purchasing behaviors and self-reported home availability indicate that home food accessibility and dietary intake are correlated among adolescents. Access to certain types of foods within the home environment may be one avenue for interventions to target as a way to improve dietary intake among adolescents.

P1.14

Friendship Networks and Child and Adolescent Dietary Behaviour: A Systematized Review

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SIG: Yes, Policies and environments

Awards: No

Purpose: Healthy food choices during childhood and adolescence are important for growth, development, and weight maintenance. While caregivers have a strong impact on their child's dietary behaviour, evidence suggests that friends' behaviours may also be an important determinant. During the transition from childhood to adolescence, youth spend more time alone and with friends and less time with caregivers. With obesity posing a serious risk to child and adolescent health, a synthesis of evidence on the association between friendship networks and dietary behaviour could shed light on a potentially significant and modifiable determinant of youth dietary behaviour.

Methods: A search for peer-reviewed primary studies among six scientific databases was undertaken. Eligible studies included child or adolescent participants (aged six to eighteen years), a measure of each participants' friendship network, and a measure of dietary behaviour for both the participant and the participant's nominated friend(s). Data on study design, participant characteristics, friendship networks, dietary behaviour, and findings were extracted and synthesized.

Results/findings: From 9,041 articles retrieved, seven studies were included in the review. Six studies were cross-sectional and one study was longitudinal. Overall, friends' unhealthy food consumption (e.g., fast food, high-calorie snacks) was associated with an individual's unhealthy food consumption, and this association appeared stronger among boys than girls. Popularity of adolescents was also associated with the consumption of unhealthy foods. Best friends' total energy intake was significantly correlated with an individual's total energy intake. Longitudinal evidence showed that an individual's unhealthy food consumption tended to remain or become similar to friends' unhealthy food consumption over time. Similarities among friends' healthy food consumption (e.g., fruits, vegetables), as well as daily breakfast consumption, were inconclusive.

Conclusions: Social network analysis in the adolescent dietary behaviour literature is beginning to emerge; however, only a few of the possible social network derived variables available have been investigated as potential correlates of diet. Results highlight friends' significant influence on unhealthy food consumption among adolescents. Programs that focus on modeling healthy eating practices among friendship groups may be an effective method of reducing unhealthy food consumption, which in turn may help promote healthy body weight among youth.

P1.15

Diet quality of young adults enrolling in TXT2BFiT a mobile-phone based healthy lifestyle intervention trial

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Objective: Young adulthood is a period associated with poor dietary habits and vulnerability to weight gain. Population studies have revealed that inadequate fruit and vegetable intake, excessive sugar sweetened beverages and frequent take-away food consumption are among the dietary habits requiring intervention. This study aimed to examine the dietary patterns and diet quality of overweight young adults upon enrolment into a mobile-phone based healthy lifestyle intervention, TXT2BFiT.

Methods: Baseline dietary intakes of 248 overweight young adults aged 18-34 years were assessed using the Dietary Questionnaire for Epidemiological Studies version 2 (DQESv2). A Healthy Eating Index (HEIFA) based on the 2013 Dietary Guidelines, was used to rate individual diets according to intake of core foods and deleterious nutrients including sugar, sodium, saturated fat and alcohol. Findings were compared with the 2011 Australian National Nutrition Survey (NNS). Differences between genders were assessed with t-tests and Chi-squared-tests for proportions. Analysis-of-variance models were used to determine linear trends in intake of core and non-core foods and nutrients across quartiles of HEIFA scores. Linear regression analyses were conducted to determine associations between HEIFA score, sugar sweetened beverages and take-away food consumption.

Results: Data from 141 females and 89 males (n=230) with a mean (SD) body mass index of 27 kg/m² (2.6) were included in the analyses. Diet quality was poor amongst this cohort, with a mean score of 45.4 (range 21.7-77.0), out of a possible 100 points. There was no significant difference between genders. Compared with the diet of 19-30 year-olds from the NNS, this cohort had a lower intake of some core foods and higher intake of alcohol and saturated fat. Those with better quality diets reported higher intakes of fruits, vegetables and wholegrain cereals (p<0.001). Take-away food (p=0.01) and sugar sweetened beverage consumption (p<0.001) were found to be negatively associated with diet quality.

Conclusions: The diets of overweight young adults were poorer compared with the reference Australian population within the same age group. This study confirms the need to increase fruit and vegetable intake and restrict alcohol and take-away foods in this population. Additional focus on saturated fat and wholegrain intake is indicated.

P1.16

The Relationship between Intake of proteins and amino acids and Polycystic Ovary Syndrome

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SIG: Yes, Early care and education

Awards: No

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in reproductive women. Nearly 10% of young women in this period involved. Although factors such as Insulin Resistance, hyper insulinemia, obesity and dietary are suggested to be associated with PCOS, cause of PCOS is not completely understood. Proteins and amino acids (a key component of the usual diet) of participants can also affect the factors of this disease and may have beneficial effects on treatment of PCOS. However, research in this area is scarce. The purpose of this study was to evaluate the relationship between amino acids and protein products consumption and PCOS.

Methods: This descriptive cross-sectional study of 400 women was conducted in Shahid Beheshti Hospital of Isfahan University of Medical Science, Iran. Amino acids and proteins intake was evaluated by validated food frequency questionnaire. Other variables such as ovarian disease, inherited predisposition, age at menarche, physical activity and history of other diseases were evaluated using questionnaire. Data analysis was performed by a logistic regression test using SPSS software version 15.

Results: There were a significant association between PCOS and ovarian disease ($P < 0.001$), age ($P < 0.001$) and using medication ($P = 0.001$). Body mass index (BMI) was inversely associated with PCOS, but it was not significant ($P = 0.068$). However, no statistically significant relationship was observed between the intake of MALT, LEUC, METH, CYST, PHEN, VAL, ASPA, GLUT, and PCOS. Based on the results, the consumption of Met and PCOS were not significantly related but their relationship may be remarkable ($p\text{-value} = 0.068$) and there was significant relationship was observed between tyrosine, glycine, prolin, arginine and methionine with PCOS.

Conclusions: The findings of this study indicated that ovarian disease and medication use is directly linked to PCOS. According to the results of this study, significant relationship was observed between tyrosine, glycine, prolin, arginine and methionine with PCOS.

P1.17

Food practices of childcare staff and the association with dietary intake of Dutch children at childcare

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Purpose: The study explored the associations between various childcare staff food practices and children's dietary intake at childcare centres.

Methods: Energy balance-related dietary intake (fruit, vegetables, sweet and savoury snacks, water and sweet drinks) of a total of 398 1- to 3-year-old children at childcare was registered on two weekdays within one week, using observations by dietitians and childcare staff. Childcare staff practices of 24 staff members were assessed using questionnaires administered by dietitians. Data were analysed using multilevel regression analyses.

Results: Children consumed much fruit and sweet snacks at childcare, and they mainly drank sweet drinks. When staff explained to the children what they were doing during food preparation, children ate significantly more fruit. Children ate significantly less sweet snacks when they were allowed to help with the preparation of meals. When staff stimulated children to continue eating, they ate more vegetables and when staff gave children food without asking them whether they wanted any, the children ate less sweet snacks. If staff ate together with the children, children ate significantly more sweet snacks.

Conclusions: The study showed the importance of childcare staff food practices for children's food intake at childcare. Although more research is needed to examine the conditions under which these practices can have a positive impact on children's dietary intake, especially child involvement in meal preparation at childcare seems to hold promising results.

P1.18

Advanced academic performance in the tests for college admission is associated with nutritional quality of food intake at age 14.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective: Consumption of refined carbohydrates and saturated fatty acids has been related to poorer cognitive performance in both children and adolescents. These macronutrients interfere with synaptic plasticity and neurogenesis in the hippocampus, disrupting learning and memory processes. We aimed to study the association between nutritional quality of food intake (FI) at age 14 and academic performance in the tests for college admission in youths from Santiago (Chile).

Methods: Longitudinal population-based study. In a random sample of 450 youth (17.8 ± 0.5 years), we measured nutritional quality of FI at age 14, using a validated food frequency questionnaire, and academic performance using the Language and Mathematics tests for college admission. Depending on the amount of saturated fat, fiber, sugar and salt in the foods, FI was considered unhealthy (poor nutritional value foods and high in fat, sugar, salt, and calories), poor-to-fair (highly processed items although low in fat) and healthy (nutrient rich items and protective foods). Tests scores ≥ 75 th percentile in our sample were considered advanced academic performance. Binomial logistic regressions tested the relation between advanced performance (outcome) and nutritional quality of FI (exposure), after adjusting for sex, socioeconomic background and type of school.

Results: At age 14, the quality of FI was unhealthy and fair-to-poor in 16% and 65% of participants, respectively. Unhealthy FI at age 14 lowered the odds of advanced performance by 79% (OR: 0.21 95% CI: 0.08 to 0.53) in Mathematics and 56% (OR: 0.44 95% CI: 0.20 to 0.97) in Language, compared to healthy FI. A fair-to-poor nutritional quality of FI lowered the odds of advanced performance by 44% (OR: 0.56, 95% CI: 0.31 to 0.98) in Language and 58% (OR: 0.42, 95% CI: 0.23 to 0.78) in Mathematics, compared with healthy FI.

Conclusion: In our sample, nutritional quality of FI at age 14 was associated with performance in the tests for college admission. These results suggest that the effect of energy-dense, low-fiber, high-fat dietary patterns on academic performance in young people could be long-term. These findings support the notion that academic and health-related behaviours are linked.

Funding: FONDECYT-1100431 and PAI-79140003.

P1.19

Barriers, benefits and behaviors related to eating breakfast among rural adolescents.

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SIG: Yes, Policies and environments

Awards: No

Objective: The purpose of the study is to identify modifiable determinants of breakfast consumption among rural adolescents. Using data from Project breakFAST, we analyze the association between perceived barriers to eating breakfast, knowledge of school-related benefits of eating breakfast and modifiable behaviors that support or interfere with breakfast consumption among a racially and economically diverse rural high school population.

Methods: The participants were 800 adolescents from Minnesota, USA attending one of 15 rural high schools. This cross-sectional analysis uses baseline data from a group randomized trial aimed at increasing school breakfast participation through policy and environmental-level school changes. Students completed an online survey asking about demographics, breakfast eating behaviors, and the barriers and benefits of eating as it relates to school performance. Scales of breakfast beliefs, barriers and benefits were created by summing item responses. Bivariate analysis (Chi-square tests and two-sample t tests) and multivariate linear regression, accounting for clustering by school, was performed using Statistical Analysis Software (version 9.3, SAS Institute Inc., Cary, NC). Each scale was modeled independently. A two-sided p-value < 0.05 was considered statistically significant.

Results: The participants were 9th (48%) and 10th grade students, 36% free/reduced price lunch, 31% non-white and 55% female. Bivariate analysis revealed no statistical differences in sociodemographic characteristics or weight and breakfast skipping (breakfast < 3 days per week). However, breakfast skippers compared to non-breakfast skippers reported fewer school related benefits and beliefs and more barriers to eating breakfast ($p < 0.01$). Adjusted models including random effects of school and fixed effects of gender, race, grade, FRL and weight status revealed breakfast skippers reported fewer positive beliefs (OR=0.77, 95%CI=0.73-0.83), fewer benefits (OR=0.94, 95% CI=0.92-0.97) and more barriers (OR=0.84, 95%CI=0.81-0.88) than non-breakfast skippers.

Conclusions: Breakfast skippers are less likely to perceive school-related positive benefits due to eating breakfast and report more barriers. Future intervention research should focus on alleviating barriers and enhancing education around the school related benefits of eating breakfast.

P1.20

Nutritional Knowledge, Nutrient Intake and Body Composition in Royal Navy and Royal Air Force Recruits

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

To assess the nutritional knowledge, nutrient intake and body composition of Royal Navy (RN) and Royal Air Force (RAF) recruits to inform the content of a new healthy lifestyle education package to be delivered during initial military training.

Methods:

RN and RAF recruits commencing training at HMS Raleigh and RAF Halton were given an initial study brief, after which 158 RN recruits (136 male; 22 female) and 143 (126 male; 17 female) RAF recruits consented to participate. The General Nutrition Knowledge Questionnaire (GNKQ) and a Food Frequency Questionnaire were administered to volunteer recruits, and their height, body mass (from which Body Mass Index (BMI) was calculated), and waist circumference were measured.

Results:

At the start of initial military training RN and RAF recruits had a similar age, height and body mass. However, RN recruits had a higher mean waist circumference ($P < 0.05$).

Mean RAF recruit nutritional knowledge scores were higher compared with mean RN recruit scores (54.2 (8.8) % vs. 51.3 (9.8) %; $P < 0.05$). Specifically, RAF recruits scored higher on the knowledge of food sources of nutrients and making practical food choices sections ($P < 0.05$).

When analysing the energy and nutrient intake of RN and RAF recruits, RAF recruits had a higher mean intake of total sugars in comparison with RN recruits ($P < 0.05$). No other differences in energy and nutrient intake were observed between the two groups.

Conclusions:

Evidence from this study suggests that education during initial RN and RAF military training should be focused on increasing recruit's knowledge of: food sources of nutrients, making healthy dietary choices and antioxidant vitamins in relation to performance, recovery, and preventing illness and injury. Education targeting RN recruits should also highlight the topic of weight management in relation to military capability. Further analysis is needed to determine the source of the higher sugar intake of RAF recruits and to determine differences in food intake between the two groups.

P1.21

Behavioral Lifestyle Intervention Study (BLIS) in subjects with type 2 diabetes in UAE: A randomized controlled trial in real life setting

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose:

The primary purpose of this study was to develop a behavioral lifestyle intervention and evaluate its effectiveness in improving the glycemic control in patients with type 2 diabetes in real life setting. This is because ambiguity still exists on the effectiveness of lifestyle interventions in routine clinical practice despite of the efficacy of large randomized controlled trials, suggesting the need for more research in this area.

Methods:

BLIS was a translational randomized controlled trial with two parallel arms. Patients ($n=35$) were randomly assigned to intervention or control group. All patients in the intervention group had gone through a six months behavioral lifestyle program composed of 8 sessions; 4 individual consultations and 4 telephonic calls. The cognitive behavior theory (CBT) was the underpinning theory for the lifestyle intervention, hence CBT behavioral strategies like self monitoring and goal setting were used to improve compliance to healthy lifestyle practices. The trial primary outcome was HbA1c. Secondary outcomes included weight, body mass index (BMI), body composition analysis, lipid profile, blood pressure, carbohydrates intake in grams, minutes of moderate physical exercise and were assessed using one-way Anova at significance level of $p < 0.05$.

Results:

At 6 months, the HbA1c of patients ($n=18$) in the intervention group had reduced significantly (-1.56 ± 1.81 , $p < 0.05$) while no significant change ($p > 0.05$) was observed in the control group. Similarly, both carbohydrates intake from the cereal group and the total carbohydrates intake in grams reduced significantly ($p < 0.05$) in the intervention group by 32.92 ± 54.34 and 20.94 ± 56.73 , respectively. No significant change was observed in the other secondary outcomes ($p > 0.05$).

Conclusion:

BLIS was effective in improving the glycemic control in patients with type 2 diabetes in routine clinical practice. More randomized controlled trials with larger sample size are needed to identify the key behavioral strategy that improves compliance to lifestyle modification in real life. Also future research might need to evaluate effectiveness of lifestyle programs focused on weight management in clinical practice.

P1.23

Pilot testing an electronic food diary app in nine to twelve-year-old children

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: A healthy diet in childhood is important for current and future health. Therefore accurate and practical dietary assessment tools are needed to determine food and nutrient intake in children. The aim of this study was to investigate if a newly developed photo based iPod food diary is appropriate to measure nutrient intake in nine to twelve year old children.

Methods: An electronic food diary based on the Evernote app, which allows children to take pictures of their food and drink, and to provide a short description of this alongside the photos, was developed. Sixteen children aged between nine and 12 years old, from Dunedin, New Zealand, were asked to complete an estimated paper-based food diary for four non-consecutive days in one week, followed by four non-consecutive days the next week using the Evernote diary on an iPod. Parents were also asked to provide help with filling in both diaries where needed. A subsample of participating children and their parents were invited to a group interview session post study to provide feedback and discussion around using the iPod diary.

Results: There was a high compliance for both methods, with 13 of the 16 children having full diet records for all required days for both the iPod and written food dairies; two children had three complete days for each diary. Nutrient intakes were similar, although slightly higher for the iPod diary than the paper diary. It was found that children tended not to report small items of food at meals, such as tomato sauce, small helpings of salad, or drinks taken with meals, either in the paper or iPod diaries. However, this information was available from the photos in the iPod diary. Feedback from the group interviews suggested that children found the iPod diaries easier to complete than the paper diaries and needed less help from parents and they also preferred to use the iPod diaries.

Conclusions: This pilot test indicates that iPod-based diaries are a promising method for obtaining information on food and nutrient intake in children. However, further testing is needed in a larger sample size.

P1.24

Development of a web-based 24-hour recall

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Validation studies have demonstrated that repeated 24-hour dietary recalls can provide high-quality dietary intake data. However, they are considered expensive as they rely on trained professionals for both their administration and coding. The objective of this study was to develop an automated, self-administered 24-hour recall web application (R24W).

Methods:

The development of the R24W was inspired by the USDA *Automated Multiple-Pass Method*. An organized list of commonly consumed food including multi-ethnic food was created. To enable automatic extraction of nutrient values, a code was assigned to each food. This code came from the *Canadian Nutrient File* (CNF, 2010 version) or the USDA *Nutrient Database for Standard Reference* (when the food was not available in the CNF). For mixed dishes, recipes were created using foods from the CNF. Questions about the context of meals and snacks were included. Toppings, sauces, and spices frequently added to each food or dish were suggested systematically. A list of frequently forgotten food was also suggested after the entering of each meal and snack and at the end of the R24W. An interactive summary allows respondent to track the progress of the questionnaire and to modify or remove food as needed. A summary showing all meals and snacks provides a comprehensive overview and offers one last chance to make any change to the report. In order to allow the assessment of the overall quality of the diet, all food items (single food and mixed dishes) were coded according to different nutritional criteria to enable automatic calculation of diet quality scores.

Results/findings:

The R24W includes a list of 2548 food items distributed into 16 categories and 91 subcategories. A total of 671 recipes were created for mixed dishes, including 313 multi-ethnic recipes. Food pictures illustrate between 1 to 4 servings per food item. The web-based platform allows respondents to select an unlimited number of meals and snacks per 24-hour period.

Conclusions:

This new dietary assessment tool is a simple and inexpensive tool to use that will facilitate diet assessment of individuals in large-scale studies.

Supported by a grant from the Canadian Institutes of Health Research (CIHR)

P1.25

Consuming calories and creating cavities: Beverages NZ children associate with sport

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Sugar-sweetened beverages (SSBs) are widely available, discounted and promoted, and despite recommendations to the contrary, frequently consumed by children. They provide few nutritional benefits, and their consumption is implicated in a number of poor health outcomes. This study examined the nature of the beverages that sport-playing New Zealand children associate with sport. It assessed how well the beverages aligned with nutrition guidelines and relevant regulations, and their likely impacts on health.

Methods: Eighty-two children (38 girls and 44 boys) aged 10-12y were purposively selected from netball, rugby and football clubs in low and high socioeconomic neighbourhoods, in Wellington, New Zealand (NZ). Children photographed beverages they associated with sport and recorded their reasons for photographing the beverage. The beverages were then purchased and analysed in accordance with NZ nutrition guidelines, and relevant content and labeling regulations, by: package and serving size; energy, sugar, sodium and caffeine content; pH; and advisory statements.

Results/findings: From a total of 148 images depicting 31 beverages, 30 were analysed. The beverages the children associated with sport overwhelmingly had characteristics which do not support children in adhering to NZ nutrition guidelines. Beverages photographed included sports and energy drinks, flavoured and plain milks, fruit juice, fruit drinks, ice tea, and plain and flavoured water. The majority of beverages were either recommended for 'limited' consumption (70%) or were not recommended (13.3%) for consumption by children. Over half (54.9%) of the children said they photographed the drinks because they provided energy for playing sport, or were used for hydration and to quench thirst during sport; other reasons included to illustrate marketing techniques using sport or the availability of the beverage at a sport venue.

Conclusions: Implementing public health mechanisms, such as healthy food and beverage policies, widely promoting water as the beverage of choice in sport, and implementing healthy eating and drinking campaigns in sports clubs, would assist children who play organised sport to select beverages that are in keeping with children's nutrition guidelines. As part of a comprehensive public health approach they would also reduce the substantial, unnecessary and potentially harmful contribution sugar-sweetened beverages make to their diet.

P1.26

Do children have a sporting chance? Children's and parents' perspectives on the sport-related food environment

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose:

Children have the right to live in a healthy food environment. Sport is an integral part of children's lives and presents an ideal setting to promote healthy food and nutrition behaviours. It is therefore an important part of children's food environments, however emerging research suggests that the sport-related food environment is dominated by energy-dense, nutrient-poor foods. This study aimed to explore children's and parents' perspectives on the sport-related food environment: their opinions about the environment and how it impacts their food behaviours, whether it supports parents in providing a healthy food environment for their children, and ultimately supports children rights.

Methods:

Children (n=75) and parents (n=28) were purposively selected from sports clubs in the Wellington region, and given cameras to record the food and beverage-related items they associated with sport. The photographs were used in focus groups to elicit their beliefs, attitudes and opinions on the impact of the environment on children's food and nutrition behaviours. Data were analysed using thematic analysis and the Analysis Grid for Environments Linked to Obesity (ANGELO) framework and contextualized using a child's right approach as outlined in United Nations Convention on the Rights of the Child.

Children and parents described an environment dominated by EDNP foods and beverages. They reported that the environment conflicts with positive food-related health promotion messages and that aspects of the sport-related food environment, such as food marketing, influence children's food and nutrition behaviours. Young people believed that they are deliberately targeted by food companies for commercial gain. Most parents felt that the current food and nutrition environment in sports settings did not support their efforts to provide a healthy food environment for their children, and presented a barrier to positive eating behaviours amongst their children.

Conclusions:

The sport-related food environment does not support children's healthy food behaviours, and their right to a healthy food environment. Improving the sport-related food environment requires the implementation of a comprehensive strategy comprising food policies at sports clubs and sporting venues, supported by broad public health actions. Coaches and sports administrators have a role in this arena, guided by local and central government and the global community.

P1.28

FoodMASTER Middle Grades: Process Evaluation of an Integrative, Food-based Laboratory Science Curriculum

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: The purpose of this research was to evaluate the implementation the Food, Math, and Science Teaching Enhancement Resource (FoodMASTER) Middle Grades (FMM) science laboratory curriculum using process evaluation techniques. The National Institutes of Health funded resource for 6-8th grade teachers and students contains 10 topic areas featuring 25 hands-on experiences and 12 health-focused extension activities. The resource links all materials to the NC Essential Science Standards (NCSS) and Next Generation Science Standards (NGSS).

Methods: Over the 2013-2014 academic year, nine 8th grade science teachers in Eastern North Carolina implemented FMM. Researchers used structured classroom observations, formative and summative written feedback on implemented labs, and semi-structured interviews to assess key process evaluation components (i.e. fidelity, dose received, dose delivered, and context).

Results/Findings: Structured classroom observations revealed that the curriculum was implemented as intended. Formative and summative written feedback on implemented labs provided researchers with information regarding student enjoyment and teacher satisfaction. Teachers stated the laboratories implemented in their classrooms were exciting and valuable for students. Semi-structured interviews yielded information regarding the extent to which the curriculum was implemented as well as the barriers and facilitators to implementation. Teachers reported being able to implement the majority of the chapters (92%) in their classrooms. Teachers also reported that inclement weather resulting in school closings and delays was a primary barrier to implementation. Facilitators included the hands-on and engaging nature of the labs, provision of helpful additional resources, and the step-by-step layout of the curriculum.

Conclusions: Outcomes indicated the FMM science curriculum was well received by teachers and feasible for use in middle grade science classrooms. Additionally, the process evaluation identified key barriers, facilitators, and areas for improvement of future curriculum implementation in the middle grades classroom

P1.29

Developing an mhealth intervention: Key challenges and lessons from the Growing healthy program

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Objective: Mobile phone based (mhealth) interventions are becoming increasingly popular modes of delivering health behaviour interventions. There is however scant literature to guide researchers through the development process. The aim of this paper is to share the key lessons learnt in the development of the Growing healthy program, a mhealth intervention targeting healthy infant feeding practices for socio-economically disadvantaged parents.

Methods: The Growing healthy program was developed over an 18 month period and consists of a purpose designed app and website. Users receive 3 messages a week tailored to their baby's age and current feeding method, linking users to the relevant information in the app or website. The development of the program was guided by intervention mapping and involved 1) audit of existing relevant apps/website 2) literature reviews and extensive formative work with end users to inform choice of intervention targets and strategies and 2) user testing to enhance app engagement and usability. Researchers documented development, challenges and lessons throughout the process.

Results: Project timeline and budget, together with types of phones used by the target audience is a key factor influencing the design features of mhealth interventions. Formative work in understanding the 'app' market place and preferences of end users is critical in designing an engaging mhealth intervention. Use of behaviour change theory is important in shaping intervention strategies and key app/website features. Push notifications/text messages are key to engaging and maintaining participants in the intervention and these need to be tested with end users to inform frequency, tone, and degree to which messages are tailored. Extensive user testing is required to enhance the app look and feel, usability and functionality. Finally, consideration needs to be given in the design phase to how best to integrate data collection for research purposes into the mhealth intervention to maximise completion rates and retention.

Conclusion: Developing mhealth interventions is a relatively new endeavour for physical activity and nutrition researchers. This paper provides some practical insights into the process and key lessons for future researchers.

P1.30

Test-retest reliability of the New Nordic Diet (NND) score

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SIG: No, this does not fit in any of the special interest groups

Awards: No

Purpose: There is a growing interest in the New Nordic Diet (NND) as a potentially health promoting, environmentally friendly and palatable regional diet. A score assessing adherence to the NND has earlier been created, and the purpose of the current study was to test its reliability.

Methods: A questionnaire survey was filled in by parents of toddlers (84% females, mean age 34 years) in Norway. The NND score was constructed from 24 questions, constituting ten subscales that summarize meal pattern and intake of typical Nordic foods. Each subscale was dichotomized by the median. Adding the subscales yielded a score ranging from 0-10. The score was further divided into tertiles. Test-retest reliability of the final NND score and the subscales was investigated through bivariate correlations (Pearson and Spearman). Cross tabulation and Kappa measure of agreement (k) were used to assess the test-retest agreement of classification into the three adherence categories of the final NND score, as well as into the dichotomized subscales.

Results: In total 67 parents (87%) completed the form at both occasions, approximately 14 days apart. The test-retest correlations of the NND score and subscales were $r = 0.80$ (Pearson) and $r = 0.54-0.84$ (Spearman), respectively, all $p \leq 0.001$. There was 67% ($k = 0.50$) and 67-88% ($k = 0.32-0.76$) test-retest correct classification of the trichotomized score and the dichotomized subscales, respectively.

Conclusions: Acceptable test-retest reliability of the NND score and the ten subscales was found.

Keywords: New Nordic Diet, diet score, test-retest reliability
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P1.31

Promoters and barriers for food intake among preschool children; focus group interviews with parents of children in preschools situated in low socioeconomic neighborhoods

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SIG: Yes, Children and families

Awards: No

Purpose: Already at preschool age there are socioeconomic differences in the food intake in Finland. It is not well known what are the promoters or barriers for healthy eating among preschool children. Therefore parents of preschool children in low socioeconomic neighborhoods were interviewed about their perceptions of factors that determine children's food intake.

Methods: Five focus group interviews, with in all 17 parents, were conducted in October 2014, in low socioeconomic neighborhoods in the Helsinki region. The recruitment was done in preschools and all parents had at least one child aged 3-6 years. The interviews were semi-structured with four major themes and additional questions that were based on a socioecological approach. A deductive thematic analysis was conducted for the interviews using qualitative data analysis software NVivo10. A data framework to code the data, which was based on the major themes of the questioning route and socioecological model, was used by two independent researchers.

Results/findings: Parents mentioned barriers and promoters of their children's healthy eating on different levels. A barrier for serving fruit and vegetables (FV) was especially the price of fruits and vegetables. Many parents mentioned that the preschool serves vegetables daily, so serving at home was less important. At the family level parents reported not having time and energy for planning the FV servings, and at the child level they mentioned a picky child among others. Many children had sweetened yoghurts and cereals daily, but the parents were not worried about their children's total daily sugar intake. Many families had as a practice sweets allowed only one day during the week, a barrier to keep this practice was having older children in the family.

Conclusions: In conclusion, parents recognized themselves as the most important factor influencing their children's food intake. Still, many seemed to lack knowledge about how much fruit and vegetables is enough for young children, and what is an appropriate amount of sugar rich foods per day. Preschools were seen as a good arena for children to daily have vegetables and food served according to the nutrition recommendations.

P1.32

Are food parenting practices reported by US and Canadian parents represented in published instruments?

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SIG: Yes, Children and families

Awards: No

Objective: We aimed to describe food parenting practices parents reported using to encourage their child to eat a healthful diet. We compared whether these practices were represented in published instruments and examined the extent to which practices were similar in Canada and US.

Methods: A stratified sample of parents in the US (n=74) and Canada (n=61) from an open panel survey were recruited to complete 6 open-ended survey questions asking them to describe the strategies, rules, and guidelines they used to encourage their 5-12 year old to eat healthy and what may discourage healthy eating. The open-ended questions were independently coded by two coders using the coding schemes our team developed as part of a review of 81 unique measures found in the published literature (21 primary codes, 1 to 6 secondary codes, and 226 most representative items). All discrepancies were reconciled by discussion with the full research team. Primary codes were reduced into 7 categories for comparisons (autonomy support, parental control, availability/accessibility/food-preparation, modeling/teach/reason, responsiveness, structure of feeding, emotion regulation). Multiple weighted logistic regression analyses compared whether parents emphasized items used in the literature and whether practices differed by country (US/Canada).

Results: The open-ended survey generated 2395 responses which linked to 157 (69.5%) most representative items from the literature and generated more than 30 new items. Items emphasized by the parents significantly differed from those used in published instruments ($F(5, 4225) = 19.67, p < .001$). Parents emphasized more food availability/accessibility/food-preparation (23% vs 14%) and modeling of healthy/unhealthy behaviors (19% vs 8%) whereas the literature emphasized more issues related to structure of the feeding environment (22% vs 8%). Other areas equally emphasized by parents and the literature included: parental control (about 40% of responses), autonomy support (8%), responsiveness (about 5% of responses), and emotion regulation (less than 3% of responses). Responses provided by parents did not significantly differ by country.

Conclusion: Interestingly, our study identified a number of parenting practices that are not included in current food parenting measures. Comparisons of parent responses with published items highlighted that parents emphasize different aspects of established food parenting concepts than the currently used self-report measures.

P1.33

Validation of a scale measuring the healthfulness of food purchasing intentions among parents

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: To assess the internal consistency and validity of a scale measuring the healthfulness of food purchasing intentions (HFPI).

Methods: Parents were recruited in Central Texas to take part in a study examining parent-child food purchasing interactions. Parents were the primary food purchasers for their family and had at least one child aged 2-6 years. Each completed one observed "major grocery-shopping trip" (self-defined) at their usual store and time. Receipts were collected and parents completed a questionnaire about food-related factors such as home food availability and a newly developed scale for measuring HFPI. This HFPI scale included nine items, four healthful food groups (fruits, vegetables, whole grains, and beans) and five unhealthful food groups (salty snacks, sweet snacks, sodas, other SSBs, and fatty meats). Sample question: "Before going to the grocery store, I intend to purchase fruit for my family," with responses being "Always", "Often", "Sometimes", "Rarely", or "Never." For healthful foods, 0 points were given for "never" and 4 points were given for "always." Unhealthful foods were reverse coded. Scores were summed (possible range: 0-36), with high scores indicating more healthful intentions. Cronbach's alpha was calculated to determine internal consistency, and Spearman's rho was calculated to assess associations with percent expenditure of the same nine food groups from grocery receipts and reported home food availability (Healthy Home Survey modified to assess same nine food groups) to establish validity.

Results: Parents (n=44) were mostly mothers (91%), Caucasian (75%), at least some college (93%), and 23% from families making under \$40,000 annually. Mean HFPI scores were 26.8 ± 4.1 (16 to 34). Cronbach's alpha was 0.68, with healthful foods (rs 0.16-0.36) less correlated to the whole than unhealthful foods (rs 0.25-0.60). HFPI scores were associated with measured food purchasing ($\rho = 0.402, p < 0.01$) and reported home food availability ($\rho = 0.761, p < 0.01$).

Conclusions: Many health behavior change interventions are framed in the Theory of Planned Behavior that states a person's intentions to preform a behavior predict actually performing the behavior. This scale proved to have adequate internal consistency and to be valid for use as a tool for measuring intentions related to the healthfulness of food purchasing.

P1.34

Associations between Vegetarian Diet and Metabolic Biomarkers of Liver, Kidney Functions

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Early Career Award

Purpose: Research has documented beneficial effects of Western vegetarians on health. As dietary compositions and cooking methods in Chinese vegetarian dishes are different from Western vegetarian dishes, it is unclear whether the consumption of Chinese vegetarian diets could also play the same protective role in metabolic biomarkers. The study aim was to investigate associations between vegetarian type and metabolic parameters related to liver function, kidney function, and metabolic syndrome.

Methods: A total of 592 adults (64% female, mean age=52±13 years) were recruited in a screening program in Taiwan. Anthropometric and biochemical profiles [lipids, glucose, insulin, high-sensitivity C-reactive protein, Alkaline phosphatase (ALP), Gamma-glutamyl transferase (r-GT), polipoprotein A-I (ApoA1), and apolipoprotein B (ApoB)] were collected. Vegetarian type [non-vegetarian, vegetarian, morning vegetarian (individuals who only eat vegan diet at breakfast)] was measured using questionnaires. Chi-square tests and ANCOVA were conducted to examine the relationships between vegetarian type and biomarkers. Covariates included age, gender, and body mass index (BMI).

Results: After being adjusted for other covariates, ALP was lower among vegetarians ($p=0.017$) while r-GT was higher among vegetarians ($p=0.015$). Both vegetarians ($p=0.007$) and morning vegetarians ($p=0.027$) had a higher level of uric acid compared to non-vegetarians. Regarding metabolic biomarkers, vegetarians had a lower levels of total cholesterol ($p<0.001$) and low-density lipoprotein cholesterol (LDL-C) ($p<0.001$) compared to non-vegetarians. In addition, high-density lipoprotein cholesterol (HDL-C) ($p<0.001$), triglycerides ($p=0.001$), ApoA1 ($p<0.001$), ApoB ($p<0.001$), fasting glucose ($p=0.039$), and fasting insulin ($p=0.007$) were higher among vegetarian. We further dichotomized individuals into healthy and unhealthy group based on diagnostic clinical values for each biomarker. Among the three dietary types, vegetarians were less likely to meet the unhealthy clinical cut-offs for LDL-C ($p=0.002$), HDL-C ($p=0.015$), total cholesterol ($p=0.008$), and uric acid ($p=0.034$). Although vegetarians and morning vegetarians had greater triglycerides, fasting glucose, and fasting insulin compared to non-vegetarians, these differences did not reach significance after applying definitions of clinical diagnosis.

Conclusions: Chinese vegetarian diets influence metabolic health differently. Overall, Chinese vegetarian diets seem to have favorable effects on metabolic parameters. Future research needs to explore why vegetarian diet may slightly increase triglycerides, fasting glucose, and fasting insulin among Taiwanese.

P1.35

Prime Minister for a Day: Children's views on action on junk food advertising

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SIG: Yes, Policies and environments

Awards: No

Objectives: In 2010 the World Health Organization called on member states to identify the most suitable approach to reduce the impact of marketing of unhealthy foods and beverages on children. This study sought to do this by asking children their views about action on junk food advertising.

Methods: Semi-structured interviews were undertaken with a strategic sample of 30 children aged 12 and 13 recruited from a range of schools across the Wellington region, New Zealand. Participants were from a range of ethnicities and deprivation. Interviews were audio recorded, transcribed, and analysed using thematic analysis.

Results: When asked to identify advertisements they were familiar with, all participants named junk food advertisements, and their placement in a number of media. Overwhelmingly, participants said that the advertisements made them feel hungry. When asked if junk food should be advertised to children, many agreed that it should not. For example, one child noted that "I reckon it shouldn't, because then children could get like diabetes and stuff like that". When asked what they would change about junk food advertising if they were Prime Minister for a day the children had a range of suggestions. These included: "I would change ones about lollies. ... 'cause like when a kid sees lollies, they really want it. And they'll just keep on begging for it"; having less ads on the internet because "you see it so many times it's boring"; taking all the billboards down; not using rugby players to promote junk food; moving lollies from beside checkouts; and "putting more healthy ads on".

Conclusions: Children in this study were well aware of the ubiquitous nature of junk food advertising and its success in making them feel hungry. Many children were able to identify action needed to reduce the impact of junk food advertising, lending further support for such action. This research demonstrates the value of children's participation in decision-making about their lives. As such, it is an important reminder of the right to participate given to children under the United Nations Convention on the Rights of the Child.

P1.36

Development of nutrition education tools for introductory courses provided to refugees and new immigrants in Oslo, Norway

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: This formative research develops nutrition education modules about new food environment, food and the effect of food on health for program advisors of Oslo's introductory program for refugees and new migrants. Just-arrived immigrants and refugees may find challenges encountering a new food environment. Resettling in new countries often means adopting less healthful dietary habits and more risk of nutrition-related health problems. Oslo's health authorities include health and nutrition information in the 'language tuition and introduction programme' they must provide refugees and immigrants. In 2013, 1,098 persons participated in the introduction programme for new immigrants in Oslo. The programme, lasting 550 to 2,400 hours, targets a mixed population with low literacy.

Method: Based on previous studies and experiences with new immigrants, public health nutritionists, workers and the introductory programme's program advisors have developed nutrition education resources, a guide for program advisors and teaching material for program participants. This includes pictures, short videos, vignettes, virtual guided tours to supermarkets and cooking workshops. The educational material's theoretical framework is based on health literacy and cultural sensitivity and targets a population with low health and nutrition literacy and limited knowledge of the host country's language and food environment. Collaborators on this project are: Resource-Centre for Migration Health, Agency of health, Oslo Municipality; The Norwegian Diabetes Association; Introductory Programs for new in Norway, Oslo Municipality, Oslo and Akershus University College including students and researchers in public health nutrition.

Results: Program advisors choose tools according to the participants' needs. Group discussions indicated it is important the material needs no extensive training. Modules include: food shopping in a new environment, adapting food for religious and cultural preferences, the host country's food culture, food choice and economy, food safety and hygiene, dental care, child nutrition and links between nutrition and physical activity to health, especially non-communicable disease. The material will be tested January-April 2015 and evaluated by interviews with program advisors and participants.

Conclusion: Few studies document the process of developing nutrition education tools for new immigrants. This study will provide preliminary knowledge on possible approaches for easing the transition into a new food environment.

P1.38

School food environments and adolescent dietary habits: time for action?

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SIG: Yes, Policies and environments

Awards: No

Purpose:

The food environment can determine dietary choices and thus impact on obesity. There is equivocal evidence on the impact of school food environments on food choice and obesity which may be related to culture and context. The aim of this study was to examine the food environment within and outside of schools in Ireland and examine associations with food habits. This is the first study of its kind among post-primary schools and their pupils in Ireland and the first to simultaneously explore both the internal and external school food environments.

Methods:

Quantitative data via an online questionnaire were collected on the internal school food environment (n=63 schools). The external school food environment was assessed by mapping food businesses within one kilometre of schools, using ArcGIS 10. Food frequency questionnaires were used to capture pupils' (n=5,163) habitual intake of select foods (sweets, soft drinks, fruit and vegetables). IBM SPSS 20.0 was used for descriptive and inferential statistics.

Results:

The internal school food environment is varied in Ireland; 68.3% of schools had a canteen, 52.5% a small food shop and 37.1% vending machines. A third of schools sold French fries in their canteen while 44.2% sold energy-dense nutrient-poor foods in their school shops. Of the 63 schools, 96.8% had one or more food selling businesses, and 75% had one or more fast-food businesses within one kilometre of the school. More pupils reported daily consumption of fruit and vegetables in schools designated as non-disadvantaged, schools outside of Dublin (capital city), girls-only schools and schools where less than 10% of the food premises were fast food businesses. More pupils reported daily consumption of sweets and soft drinks in urban schools and schools with a fast food restaurant in close proximity.

Conclusions:

These data characterise food environments for post-primary school children in Ireland and contribute to the debate on restricting access to certain foods and food businesses for school children to enable behaviour change.

P1.40

A comparative nutritional content analysis of vegetarian blogs written by registered dietitians and by non-dietitians

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Purpose:

Vegetarism is a diet that has grown in popularity among consumers but that may be associated with various nutrient deficiencies when poorly planned and implemented. This study aimed to assess the variations in the nutritional content of recipes in 24 nutritional blogs written by dietitians and by non-dietitians that have vegetarism as their primary topic.

Methods:

Twenty-four vegetarian nutrition blogs (n=12 written by dietitians and n=12 written by non-dietitians) were selected through the search engines Technorati and Google. For every blog, 2 vegetarian entree recipes per season (from January 2013 to December 2013) were selected chronologically (n = 192 recipes). The software Nutrifac® was used to analyze the nutritional content of each recipe against established Canadian and American nutritional recommendations for healthy adults. Descriptive analyses and variations in the recipes were assessed using SAS version 9.2 software for energy content as well as for the following nutrients: essential amino acids, n-3 fatty acids, n-6 fatty acids, sodium, iron, zinc calcium, vitamin D and vitamin B₁₂.

Results/findings:

All dietitians of the blogs sampled live in the United States of America, whereas the non-dietitians who also live in Canada, Scotland, India, Morocco or Australia. The recipes found on dietitians' blogs are mainly semi vegetarian (75%), compared to a majority of lacto-ovo-vegetarian recipes (75%) found on the non-dietitians' blogs. Dietitians' recipes were significantly lower in total energy, n-6 fatty acids, non-hemic iron ($P \leq 0.05$) and sodium ($P \leq 0.01$), contained significantly more vitamin D, and had a higher protein proportion than non-dietitians' recipes ($P \leq 0.05$). Furthermore, dietitians' and non-dietitian's recipes significantly differed according to their vegetarian dietary patterns and sources of animal protein included.

Conclusions:

Our study is the first to compare the nutritional quality of recipes presented in nutrition blogs written by either dietitians or non-dietitians. Our results show that the nutritional quality of recipes published on dietitians or non-dietitians' vegetarian blogs differs for energy content and for some nutrients. Whether expanding the comparative analysis between dietitians' and non-dietitians' blogs targeting different nutrition-related topics (e.g. weight loss, pregnancy, or diabetes) would yield different results remains to be investigated.

P1.41

Energy drinks: hype or hyper? A qualitative exploratory study involving children, parents and teachers from schools in North East England

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Globally the energy drinks industry is thriving with sales estimated to be over \$12.5 billion in 2012. These drinks generally contain high levels of caffeine and sugar. Regular consumption of energy drinks is increasingly reported by young people under 18, but little research has been undertaken with this population to explore their use of these drinks. The primary purpose of this study is to investigate what motivates children and young people to consume energy drinks and explore their perceived effects, in order to inform the development of tailored resources and interventions.

Methods:

Focus groups are underway with pupils (age 10-11 and 13-14 years) from primary and secondary schools in North East England. Semi-structured interviews are also being undertaken with school staff and parents. All data will be transcribed verbatim and analysed using the constant comparative approach. Preliminary analyses will be discussed with key stakeholders, including children and families, at one or more participatory workshops scheduled to take place in March 2015.

Findings:

To date, four focus groups with pupils (n= 17) and interviews with school staff (n= 6) have been conducted. Emerging themes include the role of branding and marketing on young people's choices, in addition to the influence of parents, siblings and peers. The data highlight similarities and differences between the children and young people's views and those of adult participants, and gender differences amongst the young people. There is heterogeneity in the motivations, perceived benefits and risks, and the health and behavioural effects associated with energy drink consumption. Suggestions have been put forward by participants to address these issues, and subsequent discussions will consider how these might work, and for whom.

Conclusions:

Although data collection is ongoing, a number of important issues have already begun to emerge. Given that this is the first in-depth UK-based study on energy drinks and, to our knowledge, the first study on this topic to involve younger children, we are confident that it will continue to generate important findings that will be of interest to diverse academic, practitioner and lay audiences.

P1.42

A home food inventory app (eHFI) with pictures and audio for low literacy Somali households

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SIG: Yes, e- & mHealth

Awards: No

Objective: A home food inventory tool (HFI) was validated in low-income Somali immigrant families in Minnesota. However, in some uses the tool was inaccurate due to the low English and Somali literacy levels among participants. Therefore, a new data collection procedure was needed that allowed study participants accurate and independent completion of the inventory using pictures and audio. The HFI was adapted to a rich media interface and tested in the target population.

Methods: The original validated HFI tool is a checklist inventory of foods in the household (e.g. dairy, fruits, vegetables, snacks) from which an obesogenic score can be calculated. Two categories of the existing HFI were piloted (fruit and vegetables, 56 items) to develop and test the present technology. Two Somali-speaking university students translated, recorded audio in both English and Somali and identified images to accompany each fruit or vegetable item. The text, audio and visual files were integrated into a new HFI application for a tablet device (eHFI). Users have the option of viewing an image file or selecting an audio file that will 'read aloud' the item in English or Somali. The user selects yes (present) or no (not present), available in audio and icon for each food item. eHFI stores user responses and the pattern of use is uploaded to a secure website. eHFI was vetted by community partners.

Results: Gathering of image files, translation and recording audio files for all of the original HFI items in two languages was completed in 29 hours. The eHFI was tested in the field by 8 individuals (5 Somali). Time to complete ranged from 4-8 minutes. Feedback on audio quality, size and type of images, and ability to follow direction was solicited and incorporated. Key feedback was related to challenges for participants not accustomed to tablet interface.

Conclusions: eHFI advances data collection among low literacy populations. Although developed specifically for Somali families, eHFI can be adapted easily to other language groups and survey tools to improve the accuracy, decrease burden for participants, improve efficiency for data collection and entry. Next steps include criterion validation in the target population.

P1.43

Development of the Parent Curriculum for Strategies for Effective Eating Development (SEEDS) Intervention: A Pilot Study

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SIG: Yes, Children and families

Awards: No

Purpose:

This poster will describe a pilot study of the parent curriculum for SEEDS (Strategies for Effective Eating Development)-a family-based, obesity prevention program for Latino and African American families with children ages 3-5. Employing the principles of self-determination theory, the parent curriculum is designed to increase parents': 1) sensitivity and responsiveness to children's cues of hunger and fullness; 2) success in helping children try new foods (e.g., increasing frequency of presentation, helping children explore new foods through multiple senses); 3) knowledge of appropriate child-sized portions; 4) mealtime routines; and 5) effective responses to eating cues in the larger environment. Innovative aspects of the SEEDS intervention are its intergenerational, culturally-focused approach, integration of media, and the emphasis on children's recognition of internal cues.

Methods:

The pilot study used formative evaluation strategies, collecting qualitative and quantitative data to refine the parent curriculum. The 7-week program consists of one 45 minute parent session per week. Three parent educators facilitated the SEEDS parent curriculum at 3 sites in Washington and Texas reaching 34 preschoolers. After each session, educators completed feedback forms that included both quantitative and qualitative questions. Upon completion of the pilot, educators participated in a group meeting with the curriculum developers.

Results/Findings:

Parents found the videos and activities engaging, and found the content helpful in giving them ideas for feeding their children at home. However, participants were reluctant to share information about their feeding practices during the sessions, so several activities were changed to reduce the amount of personal sharing necessary. Also, many participants had trouble developing goals at the end of the sessions, so a list of possible goals was developed, along with a framework for choosing goals and reporting parent progress at the next session. The pilot identified numerous places where the language and activities could be changed to benefit a low literacy audience, and also identified ways that connections across the various lessons could be strengthened.

Conclusions:

Results from the pilot study are encouraging and suggest that SEEDS may be a helpful program for helping parents modify their feeding, mealtime, and snack routines to reduce childhood obesity risk.

P1.44

Cognitive Load Affects Eating Behaviors of College Students

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: Little is known about the relationship between weight-related behaviors and cognitive load (working memory available to complete complex mental activities, such as problem-solving, decision making, and following instructions-mental activities required for planning meals, selecting foods, and other health-related decisions). Working memory availability declines in the presence of acute (e.g., emotional distress) and/or chronic (e.g., discrimination, low income) stressors and, in so doing, increases cognitive load. High cognitive loads may interfere with food decision making that, in turn, affects health and weight status. This study explored associations between cognitive load and eating behaviors, physical activity, body mass index (BMI), and waist circumference of college students.

Methods: College students (n=1018) from 13 institutions completed an online survey assessing eating behaviors (routine and compensatory restraint, eating response to external cues, emotional eating, and intakes of fruits/vegetables, alcohol, and sugar-sweetened beverages), stress level, and physical activity level. BMI and waist circumference were measured in duplicate by trained researchers using standard procedures. A cognitive load score was derived from stress level, time pressure/income needs (based on paid-work hours/week), and race and nationality (non-white race and non-US nationality were proxies for increased risk of racial discrimination).

Results/Findings: High cognitive load participants (n=593) were significantly ($P<0.05$) more likely to be female, older, and further along in school than those with low cognitive loads (n=425). Compared to low cognitive load participants, high cognitive load participants were significantly more likely to eat <5 cups of fruits and vegetables/day, have greater routine and compensatory restraint, and greater susceptibility to eating in response to external cues and emotional eating. Although not significant, there was a trend in high cognitive load scores being associated with greater alcohol consumption, BMIs, and waist circumferences.

Conclusions: Cognitive load may be an important contributor to health disparities common to low income, minority populations. Understanding how cognitive load affects eating and other weight-related behaviors could lead to improvements in the effectiveness of obesity prevention and intervention programs.

P1.45

Child and parent influences on food purchases: Measure development and associations with obesity outcomes.

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective: Food purchasing is thought to be an important contributor to excessive caloric intake and obesity, as foods purchased are those that make up the home food environment and are associated with dietary intake. To date, research on food purchases has predominately assessed the sociodemographic and price differences in healthful food purchases and qualitative influences on food purchases, but no research has investigated a comprehensive, theory-driven set of social ecological influences on food purchases for parents and their school-age children. Therefore, this study aimed to develop measures to quantify social ecological influences on food purchases and assess associations between the new measures and important obesity-related outcomes to inform future research, practice and interventions.

Methods: Parent (n=90) and child (n=90) baseline data from the HOME Plus study were used for analysis. Trained study staff collected the following data: home food availability (measured via a valid and reliable instrument); anthropometry (height and weight); children's dietary intake (three-day dietary recall interviews); and purchasing influences (measured via survey items on broad food purchasing influence constructs, including access, cost, cooking ability, nutrition concern, preferences, social pressure, and time).

Exploratory factor analysis was used to develop psychometrically-sound measures of social ecological food purchasing influences for parents and children. Convergent validity was measured whenever possible. Chi-square, Pearson correlations, non-parametric tests, and t-tests were used to test whether the new measures differed by sociodemographic characteristics. Multivariate regression models will be used to assess associations between the new purchasing influence measures and home availability of fruits, vegetables, and foods contributing to obesity, body mass index, and dietary intake.

Results: Nineteen new measures were developed under the broad food purchasing influence constructs. Tests generally supported convergent validity of the new measures. Multivariate analyses of associations between these newly developed measures and important health-related outcomes are currently being analyzed and will be ready in time for the conference.

Conclusions: Findings will provide the scientific foundation to inform and personalize interdisciplinary practice, community-based research, and innovative interventions at individual, community, and policy levels to address the obesity epidemic among youth and their parents.

P1.46

Long-term diet quality and its association with cardiometabolic risk in older Australians

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Poor diet is a key risk factor for cardiometabolic disease. Dietary patterns, including measures of diet quality, provide a holistic approach to examining diet. Older adults are an understudied population in dietary pattern literature and at increased risk of cardiometabolic conditions. This study examined the relationship between long-term diet quality and cardiometabolic risk among older Australians.

Methods: Participants aged 55-65 years (297 men, 357 women) completed a self-reported questionnaire in 2010 and 2012 including a 111-item food frequency questionnaire, and provided fasted blood samples in 2012. Diet quality was assessed via the revised dietary guideline index (DGI-2013) and averaged over 2010 and 2012. The DGI-2013 reflects adherence to the Australian Dietary Guidelines providing a continuous score out of 130, with a higher score indicating greater diet quality. Cardiometabolic biomarkers (plasma glucose, serum insulin, glycated haemoglobin (HbA1c), total cholesterol, high density lipoprotein, low density lipoprotein, triglycerides) and body mass index (BMI) were measured and log-transformed if required. The homeostatic model assessment of insulin resistance (HOMA-IR) was calculated and standard clinical cut-offs were used to categorise individuals into diabetes risk and dyslipidaemia categories. Associations between DGI-2013 and cardiometabolic risk were assessed via multi-linear regression and logistic regression, stratified by sex and adjusted for age, education, smoking, physical activity, BMI and menopausal status in women. Results are presented for a 10-unit increase in DGI-2013 score.

Results: Men had a mean (\pm standard deviation) DGI-2013 score of 85.4 ± 13.0 and women had a mean DGI-2013 score of 90.9 ± 12.2 . There were no significant associations between diet quality and cardiometabolic risk in the whole sample, but when stratified by sex, higher diet quality was associated with lower risk of dyslipidaemia (odds ratio 0.75, 95% confidence interval 0.59-0.97; $P=0.02$) in women. There were no other significant associations.

Conclusions: Women with higher diet quality were less likely to have dyslipidaemia. The DGI-2013's predictive validity for health outcomes needs to be pursued in further studies.

P1.47

Acculturation and plasma fatty acid concentrations in Hispanic and Chinese-American adults: The Multi-Ethnic Study of Atherosclerosis

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Acculturation to the U.S. is associated with changes in diet, physical activity, and increased risk of cardiometabolic diseases, but pathways are not fully understood. Plasma fatty acid levels (FAs), which reflect both dietary intake and metabolic processes, are predictors of cardiovascular risk, and may give insights into the pathway between acculturation and cardiometabolic risk. We aimed to investigate the cross-sectional relationship between acculturation and plasma FAs, and ultimately health outcomes, in a sample of Hispanic- and Chinese-American adults.

Methods: Participants included 697 Hispanic and 712 Chinese adults from the Multi-Ethnic Study of Atherosclerosis (MESA), who had full plasma phospholipid data and acculturation information. Acculturation was determined from three proxy measures of acculturation: nativity, language spoken at home, and years in the U.S. α -Linolenic acid, linoleic acid, eicosapentaenoic acid, and docosahexaenoic acid were measured in fasting plasma. Body mass index (BMI), waist circumference, insulin, glucose, and insulin resistance (HOMA-IR) were also considered. Linear regression models were conducted in ethnicity-stratified analyses, with acculturation as the predictor and plasma FAs and health measures as the outcome variables. Models controlled for age and gender.

Results: There were no significant relationships between acculturation and plasma FA levels for either ethnic group. We confirmed positive associations between acculturation and adiposity in both ethnic groups (p -values = 0.002 and 0.003), but not with glucose or insulin.

Conclusions: Associations were detected between acculturation and higher BMI, but not plasma FAs. Although we cannot rule out measurement error in some of the plasma FAs, nor the effect of limited variability in some of the FAs in these populations, our analyses strongly suggest that changes in plasma FAs are not one route through which acculturation to the U.S. may increase cardiometabolic risk. As previous studies have shown that dietary FA is correlated with acculturation, further research into (1) the accuracy of dietary FA measurement and (2) overall metabolism is warranted. In the meantime, our results suggest that BMI and not plasma FAs may be the primary focus of interventions for decreasing cardiometabolic risk in acculturating adults.

P1.48

Associations between fruit and vegetable intake and quality of life

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Deakin University, Melbourne, Victoria, Australia

SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: Fruit and vegetable consumption (FV) plays an important role in promoting health. Functional health and quality of life (QoL) has become an integral part of ageing well. An ageing population has resulted in people now living on average 20 years past retirement, yet little research focuses on this age group. This study investigates the relationship between fruit and vegetable intake and variety and QoL.

Methods: Men and women aged 55-66 years were recruited into the Wellbeing, Eating and Exercise for a Long Life study from the Australian Electoral Roll (n=2384, 46.7% males). FV intake (serves/day), FV variety (number of types consumed/week) and socio-demographic data were collected from a postal survey in 2010. The RAND 36-item health survey assessed QoL across eight domains (physical functioning, role-limitations - physical, bodily pain, health perception, vitality, social functioning, role-limitations - emotional, emotional wellbeing) during a follow-up postal survey in 2012. Associations between FV intake and variety, and QoL, were investigated using logistic regression models, stratified by sex and adjusted for potential confounders (socio-demographic factors, physical activity, smoking, BMI).

Results: Odds ratios and 95% confidence intervals (OR, 95% CI) are reported. Fruit (M: 1.11, 1.00-1.23; W: 1.13, 1.04-1.23) and vegetable (M: 1.11, 1.00-1.22; W: 1.11, 1.03-1.21) intake were associated with general health perception for both men and women. Vegetable variety was associated with general health perception (1.04, 1.00-1.07), vitality (1.04, 1.00-1.07) and social functioning (1.03, 1.00-1.07) for men, but not women. Fruit variety was associated with mental component summary score for men (1.06, 1.01-1.12) and women (1.05, 1.00-1.10), and the vitality subscale for men (1.08, 1.02-1.13) and women (1.06, 1.02-1.11).

Conclusions: FV intake and fruit variety were associated with some aspects of QoL among older adults, after adjusting for confounders, although differences existed between men and women. These results contribute to the body of knowledge in nutrition research and will inform public-health professionals in the design of interventions, however further research is needed to determine the mechanisms driving these influences.

Funding source(s): Australian Research Council, Diabetes Australia Research Trust.

P1.49

Skipping breakfast in childhood is associated with increased blood pressure in adulthood: Longitudinal data from the Childhood Determinants of Adult Health Study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Regular breakfast consumption in adulthood reduces the risk of cardiovascular and all-cause mortality by 20-30%. Children who skip breakfast have been shown to have higher body mass index (BMI) in childhood, adulthood, and an increased gain in BMI from childhood to adulthood. Previously, we found that individuals who skipped breakfast in both childhood and adulthood have higher fasting blood insulin, indicative of insulin resistance and poor glucose homeostasis, and a poorer blood lipid profile in adulthood. These associations were preserved after adjustment for waist circumference, indicators of socioeconomic status (SES), and diet quality. However, there have been no reports on whether this association extends to adult blood pressure, which is a major modifiable risk factor for cardiovascular disease. Therefore, the aim of this study was to examine the association between skipping breakfast in childhood and adult blood pressure.

Methods: Resting blood pressure measurements were taken from the right brachial artery of 1,829 participants aged 26-36 years in whom information on usual consumption of breakfast had been collected two decades earlier when aged 9-15 years. Diet, smoking, SES, physical activity, and sleep hours were self-reported, and cardiorespiratory fitness and BMI were measured.

Results: Children who usually skipped breakfast (14.5%) tended to be older, female, smokers, and of lower SES, had less cardiorespiratory fitness, sleep hours, and energy consumption in childhood, but had higher BMI in both childhood and adulthood, and higher adult systolic and diastolic blood pressure. Although adjusting for these potential confounding or mediating factors reduced the effect by up to 30%, participants who skipped breakfast in childhood maintained a higher systolic ($\beta=1.3\text{mmHg}$, 95%CI=-0.3-2.8mmHg, $P=0.11$) and diastolic blood pressure ($\beta=1.4\text{mmHg}$, 95%CI=0.3-2.5mmHg, $P=0.01$) in adulthood compared with those who usually consumed breakfast. Childhood breakfast skippers also had an increased risk of prehypertension and hypertension in adulthood (relative risk=1.15, 95%CI=1.02-1.31, $P=0.03$).

Conclusion: These novel findings suggest that skipping breakfast in childhood may detrimentally impact upon adult blood pressure. If confirmed, these observations suggest that promotion of regular breakfast consumption to the estimated 10-30% of children worldwide that currently skip breakfast could have long-term benefits for cardiovascular health.

P1.50

Development of the Preschool Curriculum for Strategies for Effective Eating Development (SEEDS) Intervention: A Pilot Study.

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SIG: Yes, Early care and education

Awards: No

Purpose:

This poster describes a pilot study of the preschool curriculum developed for the Strategies for Effective Eating Development (SEEDS) intervention, a family-based, intergenerational nutrition and feeding program for Latino and African American families with children ages 3-5. The literacy-based, developmentally appropriate preschool curriculum increases preschool children's recognition and communication of internal cues as well as their willingness to try unfamiliar foods. Innovative aspects of the SEEDS children's curriculum include its literacy-based focus, coordination and shared language with the SEEDS parent curriculum and emphasis on children's recognition of internal cues.

Methods:

The pilot study used formative evaluation strategies, collecting qualitative and quantitative data to refine the child curriculum. Six early childhood teachers facilitated the SEEDS child curriculum at 3 sites in Washington and Texas reaching 28 preschoolers. After each session, teachers completed feedback forms with both quantitative and qualitative questions. Upon completion of the pilot, teachers participated in a group meeting with the curriculum developers.

Results/Findings:

Process analyses suggested that limiting the curriculum to two primary eating concepts was developmentally appropriate. Regarding internal cues, children did not demonstrate mastery of the concepts hungry, full/just right, and very full until lesson 6. Reinforcing the concepts each week using the dolls and activities was important. Children's natural enjoyment of filling containers underpinned activities where they demonstrated their understanding of the concepts. The multi-sensory approach to exploring foods appealed to children. Seeing the whole food as well as the prepared tasting portions helped children draw the food in their journals. Teachers reported timing issues, points of confusion due to children's cognitive capacity, and issues related to cultural adaptation or translation. The improved efficacy of two adults leading a larger group rather than each adult leading a small group emerged.

Conclusions:

Results from the pilot study are encouraging and suggest that SEEDS may increase young children's recognition and communication of internal cues and acceptance of new foods. A RCT is underway evaluating the effectiveness of SEEDS. Feedback from early childhood teachers is essential for refining the activities to support learning outcomes.

P1.51

Reliability and Validity of an Online Questionnaire to Measure Food Literacy in Primary School Children

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SIG: Yes, Policies and environments

Awards: No

Objective: Food literacy is a term used to describe the knowledge, skills and behaviors needed to achieve a healthy and environmentally friendly diet. Improving food literacy in children is gaining momentum as a strategy to address the issue of obesity in this age group. To our knowledge, there are no measures of food literacy in children.

Methods: An online questionnaire for children aged 9-10 years living in New Zealand (NZ) was developed based on the following components of food literacy; food origins, nutrition knowledge, and food skills. The 65-item questionnaire underwent three phases of testing with revisions made after each phase. In Phase 1, the questionnaire was reviewed by an expert panel (n=11) to assess content validity; the content validity index for the questionnaire was 0.83, indicating good content validity. In Phase 2, the questionnaire was pre-tested with children using cognitive interviews (n=4) and a focus group (n=4); the questionnaire was revised to ensure items were correctly interpreted by children to achieve face validity. In Phase 3, the questionnaire was pilot tested in children (n=85) at two primary schools on two occasions to assess reliability and validity; items that failed to meet item difficulty and discrimination criteria were removed.

Results: The internal consistency of each of the three content sections was acceptable to good (Cronbach's alpha 0.69-0.79) and the Intraclass Correlation Coefficients demonstrated good test-retest reliability for each section (0.69-0.83) and for the overall questionnaire (0.89).

Conclusion: The final 42-item questionnaire is a reliable and valid measure of food literacy in primary school children living in NZ, which is easily adapted for use in other countries, and shows promise as a tool for evaluating the efficacy of food literacy interventions or programs implemented in schools.

P1.52

Patterns of dietary intake and associations with demographic and socio-economic factors in 3-year old Australian children

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective:

There is limited Australian research on nutrition and diet in childhood, particularly around dietary patterns of children under the age of 5 years. This research aims to identify patterns of dietary intake in early childhood at 3-years of age and to investigate associations between early childhood dietary patterns and both demographic and socio-economic indicators utilizing Latent Class Analysis statistical techniques.

Methods:

This study is a secondary analysis of cross-sectional data from 1,536 3-year old Australian children. Dietary data was collected using questions modified from the Child and Diet Evaluation Tool relating to frequency and quantity consumed for several food and beverage items. Indicators of dietary intake included fruit, vegetables, take-away foods, pre-prepared meals, milk, juice and sugary snacks. All variables were measured categorically. Statistical analysis utilized mixture modelling techniques through Latent Class Analysis using Mplus software. Analysis investigated clustering of key dietary intake indicators.

Results:

Two distinct dietary patterns were extracted including 'healthier' and 'less healthy' class categories. The healthier pattern was characterized by greater intake of increasing number of serves of both fruit and vegetables, as well as higher quantities of milk consumption, comprising of less full cream and more skimmed milk. Comparatively, the less healthy dietary pattern showed an increased frequency of consuming take-away foods and pre-prepared meals and higher frequencies of juice consumption. There were significant differences in class membership of the dietary patterns for several key demographic and socio-economic variables. Significant predictors of belonging to the healthier dietary pattern include mother's with a university degree, a household income of \$100,000 or more and higher maternal age. Factors such as child BMI categorized as obese and parent's low perceived ability of managing financially were predictive of children belonging to the less healthy pattern of dietary intake.

Conclusion:

Analysis on this sample of 3-year old Australian children revealed two distinct patterns of dietary intake as well as significant variations in dietary pattern class membership based on demographic and socio-economic factors. The results contribute new data on patterns of dietary intake in early childhood using relatively underutilized statistical analysis techniques in nutrition and diet research.

P1.53

Determinants of food choice: from childhood to adolescence.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Evidence has shown that food intake tends to remain stable over time, however little is known about what influences this tracking. This longitudinal study explored the impact of determinants of food intake during childhood on food choice and its determinants in adolescence.

Methods: 210 participants of the Gateshead Millennium Study were assessed at two time points. At childhood (6-8 years), measures were collected on food intake, knowledge, trying, liking and preferences between healthy and unhealthy food. In adolescence (12-13 years) food choice was assessed using a food choice experiment (healthy/unhealthy snacks). Adolescents also answered questions on availability at home, intention and temptation to eat both types of food. A cognitive task assessing inhibitory control was performed. BMI and deprivation levels were recorded at both time points. Data were analysed using linear regressions and path analyses.

Results: After adjusting for all measures by age groups, path analyses showed that higher BMI during childhood significantly predicted less unhealthy food at home and was associated with higher BMI in adolescence. Liking fruits in childhood was positively associated with healthy food availability at home and temptation to eat healthy food during adolescence. Higher levels of knowledge in childhood significantly predicted less intention to eat unhealthy snacks in adolescence. Children's intake of healthy food was negatively associated with BMI and positively associated with temptation to eat healthy and unhealthy food during adolescence. Finally, higher intake of unhealthy food in childhood was associated with less inhibitory control skills in adolescence.

Conclusions: Although there were no direct associations between food intake determinants in childhood and actual food choice in adolescence, several determinants from childhood indirectly predicted food choice. Temptation to eat healthy and unhealthy foods in adolescence had the greatest total effect on food choice in this age group. Liking fruits in childhood demonstrated the highest total effect on food choice which was mediated through temptation and availability of healthy foods. These results highlight the importance of promoting healthy eating in childhood. The small sample size may have underestimated other potential associations between determinants and behaviours, thus further research is needed in this area.

P1.54

Changing eating for the better: Results from a social marketing quasi-experiment

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: To assess changes in food selections after implementing two consumer-focused social marketing (SM) programs in military dining halls.

Methods: Consumer research with military personnel underpinned the design of the SM programs. Dining hall A implemented a program of nutrition promotion/labelling based on military motivations. Dining hall B implemented the same program of promotion/labelling with additional changes to the dining layout that made salad and sandwich bars more prominent. A quasi-experimental pre-post design was used to assess the SM programs, with the number of food selections made by diners being recorded by direct observation. Changes in the number of selections from the three targeted food categories-Lean (lean meats), Fresh (fruit/vegetable based dishes) and Energy (pasta/rice based dishes)-were assessed.

Results/findings: Twelve meals (6 lunch, 6 dinner) were observed at each site (mean 280 diners/meal), with an average of 5 selections per diner. In Dining hall A, the proportion of food selections differed pre to post in the Lean category (Lunch: 39% to 44%, $\chi^2(1)=6.32$, $p=.01$; Dinner: 28% to 39%, $\chi^2(1)=23.94$, $p<.001$), the Fresh category (Lunch: 42% to 47%, $\chi^2(1)=30.89$, $p<.001$; Dinner: 41% to 47%, $\chi^2(1)=20.09$, $p<.001$), but not in the Energy category (Lunch: 12% to 12%, n.s.d; Dinner: 16% to 14%, n.s.d). In Dining hall B, the proportion of food selections did not differ pre to post in the Lean category (Lunch: 25% to 22%, n.s.d; Dinner: 45% to 43%, n.s.d), but did in the Fresh category (Lunch: 15% to 38%, $\chi^2(1)=11.59$, $p=.001$; Dinner: 39% to 46%, $\chi^2(1)=83.04$, $p<.001$), and the Energy category (Lunch: 11% to 32%, $\chi^2(1)=953.02$, $p<.001$; Dinner: 17% to 22%, $\chi^2(1)=61.61$, $p<.001$). In Dining hall B, the proportion of food selections increased at the salad bar (Lunch: 13% to 15%, $\chi^2(1)=4.12$, $p=.04$; Dinner: 11% to 11%, n.s.d) and the sandwich bar (Lunch: 12% to 15%, $\chi^2(1)=10.33$, $p=.001$; Dinner: sandwiches not served) immediately after the layout change.

Conclusions: Consumer-focused social marketing programs were effective in increasing the selection of healthy foods in military dining halls. The addition of layout changes to make Fresh food choices more prominent facilitated selection of those foods.

P1.55

Measuring adolescent breakfast, lunch and evening meal frequency: agreement between frequency and 24-hour recall measures

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Objective: Measures of meal frequency among adolescents are broadly used in population surveys although validation studies of these measures are limited. The objectives of this study are to investigate agreement between questionnaire-based frequency measures and 24-hour recall measures of breakfast, lunch and evening meals among 11-15-year-olds, and to examine whether disagreement between frequency and 24-hour recall measures varied by socio-demographic factors.

Methods: The study is part of on-going validation of the Health Behaviour in School-aged Children (HBSC) internationally standardised questionnaire. In one week 11-15-year-old students completed the HBSC questionnaire which included meal frequency items. The following week they completed a daily 24-hour recall questionnaire about their meals (response rate 88.4%, $n=412$).

Results: Agreement between frequency and 24-hour recall measures was higher for dichotomous than ordinal data. The breakfast measure had moderate agreement: per cent agreement 0.70-0.87, kappa 0.43-0.65. For the lunch measure agreement was fair when the variable was dichotomized (per cent agreement 0.65-0.84, kappa 0.29-0.54). The evening meal measure had high per cent agreement (0.83-0.95) but poor kappa (0.14-0.19). Compared to Danish native adolescents, descendants of immigrants had higher odds of disagreement on breakfast and lunch in weekdays (OR, CI 95% values for breakfast: 2.25, 1.16-4.38, lunch: 2.57, 1.33-4.95). Immigrants had higher odds of disagreement on lunch in weekends (5.27, 1.07-26.12).

Conclusions: We found a moderate agreement between frequency and 24-hour recall measures for breakfast, a fair agreement for lunch and for evening meal percent and kappa coefficients provided different results. Migration status predicted disagreement between the two methods.

P1.56

Formative evaluation of the motivation potential of nutrition text messages using focus groups.

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SIG: Yes, e- & mHealth

Awards: No

Objective: To evaluate tonal nutrition text messages prior to implementation in an intervention in a focus group setting.

Methods:

A series of tonal text messages with a solutions and substitution tone on fruits, vegetables, alcohol and junk food were developed and tested in nine focus groups (n=81) separated by age (18-22 & 22-30 years) and gender of 1.5 hours duration. A scenario for each message was read aloud. The text messages were delivered on a separate iPhone and each participant used an anonymous polling system to rate their responses to nine text messages with five options ranging from 'very likely to make me consider changing my diet/drinking habits' to 'not at all likely' or 'message not relevant.' A discussion followed each message exploring content. Binary logistic regression was used to explore the association with message response by gender and age group.

Results:

The response to the messages appeared to be more favourable for fruit and vegetables messages, with 62 to 74% reporting they would be likely to consider changing after receiving the text. For example "You need lots of fruit and veg to stay healthy, if you're not getting 2 serves of fruit and 5 serves of veg every day, then you're not eating enough" 62% (50/81) rated it as 'likely' to make them consider changing. Females were 3 times more likely to view this message favourably (OR=3.31, 95% CI [1.27-8.64], P=0.014. Alcohol messages were the least favoured. Only 35% (28/81) rated the message "Everyone deserves a fun night out. Just remember that alcohol's high in kilojoules. By slowing your drinking you're keeping in shape" as 'likely to consider changing my drinking habits'. For this message, there were significant associations for gender with females more than 4 times more likely than males to rate the message favourably (OR=4.13, 95% CI [1.53-11.1], P=0.005 after adjusting for age.

Conclusions:

Tonal preferences differ for each dietary change. There is a need to consider segmenting text message intervention target audiences by gender. These findings are useful for the tailoring of nutrition interventions and indicate the importance of testing messages prior to an intervention.

P1.57

Assessing Implementation Level and Effect of Parental Involvement in a Multi-component School Intervention targeting Fruit and Vegetable Intake among Adolescents

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: School-based dietary interventions often include a parental component, however implementation and effect of involving parents are seldom reported and evidence is inconsistent. This study evaluated the implementation and effect of the parental component in the Boost study, a multi-component school-randomized controlled trial targeting fruit and vegetable (FV) intake among Danish 7th graders (~13-year-olds) in the school year 2010/11.

Methods: The parental intervention component: Six parental newsletters, three guided child-parent activities, presentation of the Boost intervention at a parent-school meeting. Data: post-intervention questionnaire data from students, parents and teachers at 20 intervention schools. Study population: Students with parental response at follow-up (N=396). Implementation level is based on dose received and defined by participation of at least one parent. Participation in the three components was assigned points as follows: Read 1-3 newsletters=1 point, read 4-6 newsletters=2 points, participated and heard about Boost at parent-school meeting=1 point, participated in guided child-parent activities=1 point. High implementation=3-4 points, medium implementation=2 points, low/no implementation= 0-1 point. The effect of implementation level on mean self-reported fruit and vegetable intake (24-hour recall questionnaire) at the end of intervention was analysed using multilevel analyses.

Results: Overall, the *dose delivered* to parents was moderate, e.g. only for parents of 57.5 % of the students all six newsletters were uploaded onto the schools website and no students completed all three guided child-parent activities. The Boost intervention was presented at a parent-school meeting at all 20 intervention school. *Implementation level* based on dose received by parents: 37.1 % of the students had no/low overall implementation of the parental component, 38.5 % had medium implementation and for 24.4 % of the students the parental component showed high implementation. The mean FV intake at the end of intervention was 429.2 gram. Students with high parental implementation level ate 94.0 gram more FV per day compared to no/low level of parental implementation ($p=0.022$).

Conclusions: There was a significant effect of implementation level on students' fruit and vegetable intake. Parental involvement was challenged by moderate dose delivered of newsletters and of guided child-parent activities.

P1.59

Eating styles of exercisers: Development of a scale to measure exercisers' self-reported food reward behavior

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

Physical inactivity is considered an important contributor to the increasing prevalence of obesity. However, when people begin exercise programs they often report gaining weight instead of losing it. One of the possible explanation for this effect is that people may use food to reward themselves for exercising, especially when they are not intrinsically motivated to exercise. The aim of study was to develop a scale that measures people's self-reported tendency to reward themselves with foods for exercising.

Methods:

The data for the study come from a mail survey conducted in the German-speaking part of Switzerland. For this study, only responses from regular exercisers were analyzed ($N=368$). Item development was based on a focus group study that identified different patterns of eating behavior before, during, and after exercising. Responses to the 42 items were subjected to a factor analysis (principal axis factoring method with promax oblique rotation). Cronbach's alpha was calculated to determine the internal consistency of the scale.

Results:

The factor analysis identified four different subscales. The first subscale measured exercisers' self-reported food reward behavior. The second subscale indicated exercisers' tendency to balance food and exercise. A third subscale measured the extent to which exercisers refrain from eating after exercising. The fourth subscale was related to nutritional replenishment and indicated how much exercisers compensate for exercise-induced losses. Internal consistency for the four different scales was acceptable/good (Cronbach's alpha between .76 and .84). Only the first scale (food reward behavior) was positively associated with Body Mass Index ($r = .15, p = .005$).

Conclusion:

This newly developed Eating Styles of Exercisers Scale (ESES) demonstrated good psychometric properties. The food reward behavior subscale could be used as an efficient screening tool in exercise intervention programs for weight loss in order explain interindividual variability in weight loss success. This scale could also be useful to identify individuals who might profit from tailored nutrition advice.

P1.60

Does Self-esteem Predict Diet Quality in Adolescents? A 4-year longitudinal study.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: On-going concerns for adolescent nutritional status, highlights the importance of identifying potential influences on dietary behaviours in the prevention of lifestyle diseases. The long-term relationship between psychosocial factors and diet quality has not been the subject of prolonged investigation in UK teenage diets. This study investigates the longitudinal relationship between diet quality and self-esteem in adolescents.

Method: With institutional ethical approval, 151 secondary school pupils (females $n=65$) completed two questionnaires at entry (Time 1, aged 11.7 ± 0.3 years) and four years later (Time 2). Diet quality was calculated using an adapted version of the Healthy Nutrition for Kids and Youth (HuSKY) scale (Kleiser et al. 2009). Participants also completed a modified version of the Harter Self-Perception Profile for Children (SPPC, Harter, 1985), which provides a multi-dimensional overview of an individual's ratings of perceived competence in five domains and in global self-worth (GSW).

Results: At Time 1, participants demonstrated mean moderate-to-high diet quality (55.0 ± 9.8) and GSW (4.7 ± 0.88). During the adolescent transition diet quality reduced across genders (girls: $-3.30 \pm 11.72, p=0.021$; boys: $-6.35 \pm 11.88, p<0.001$) as did GSW, but only for girls ($-0.75 \pm 1.06, p<0.001$). At Time 1, linear regression modelling revealed boys GSW predicted diet quality ($r^2 = .163, p<0.001$). In girls, although no predictive relationship between the variables was found at Time 2, GSW delta values ($T2 \text{ GSW} - T1 \text{ GSW}$) were predictive for changes in diet quality between the two time points ($r^2 = .073, p=0.045$).

Conclusion: These longitudinal findings confirm that diet quality and girls' GSW decrease throughout adolescence, and that the relationship between diet quality and GSW is gender distinctive. While GSW predicts diet quality when boys enter secondary school, this disappears in later adolescence. For girls, the difference in GSW over the four years of secondary school predicts the degree of change in diet quality. These findings suggest that although self-esteem has a role in the prediction of adolescent diet quality, it is only weak. Designers of interventions, targeted at improving adolescent nutritional and psychological health, may integrate this evidence to improve the long term impact of their programmes.

P1.61

PHYSICAL ACTIVITIES AND NUTRITION FOR DIABETES IN ALBERTA (PANDA): EFFECTIVENESS TEST

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Type 2 diabetes patients often find integrating a new dietary pattern into their lifestyle challenging, resulting in poor adherence to dietary recommendations. Therefore, the Physical Activity and Nutrition for Diabetes in Alberta (PANDA) team designed a four-week menu plan that took into consideration the 4-A Framework criteria (nutritionally adequate, available, accessible, and acceptable foods). Our objective was to evaluate the effectiveness of the PANDA nutrition intervention on glycated hemoglobin (A1c), anthropometry, blood pressure, lipid profile and dietary adherence to national diabetes guidelines for nutrition therapy.

Methods: A single-arm trial obtained A1c, weight, waist circumference, blood pressure, serum lipids and dietary adherence among type 2 diabetic patients at baseline and 3 months. The inclusion criteria were: people diagnosed with Type 2 diabetes and English language speakers. The exclusion criteria were: having severe gastrointestinal issues, Type 1 diabetes or kidney disease. The intervention curriculum was based on Social Cognitive Theory and included 5 weekly group sessions, a grocery store tour, a four-week menu plan and hands-on activities. Intention-to-treat analysis was used to account for missing data. A paired t-test was used to compare the change in variables pre- and post-intervention.

Result: The average age of participants (n=73) was 59.2±9.7 (SD) and duration of diabetes was 9.1±8.3 years. After 3 months, there were statistically significant (p<0.05) reductions in A1c (-0.7%), BMI (-0.6 kg/m²), total cholesterol (-63 mg/dL), LDL-cholesterol (-89 mg/dL) and diastolic blood pressure (-5 mm Hg). Dietary changes included a reduction (p<0.05) in total energy (-179 kcal) accounted for by lower intake of protein (-6 g), fat (-10 g), saturated fat (-3 g). Sodium (-576 mg) intake was also decreased (p<0.05).

Conclusion: In individuals with type 2 diabetes, the PANDA menu plan intervention was effective in improving glycemic control, anthropometric measures and dietary adherence in the short term. The preliminary results suggest that a dietary intervention incorporating education sessions focused on menu planning and hands-on activities may be effective for diabetes management.

P1.62

Differences in maternal vegetables and fruit and milk and alternatives intake according to the frequency and importance of eating family meals

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: To determine whether the frequency and importance of eating family meals are related to maternal consumption of two food groups with the lowest relative intake in Canada; 1) vegetables and fruit (VF) and 2) milk and alternatives (MA).

Methods: As part of the *Eat Well Campaign* process evaluation, a representative sample of Canadian parents, with at least one child 2-12 years old, responsible for household food planning and preparation were recruited via random digit dialing using a simple random sample of Canadian telephone numbers. Parents were sent invitations and up to two reminders to complete four web-based questionnaires including a family meal questionnaire (FMQ) and a validated food frequency questionnaire (FFQ). Average daily portions of VF and MA consumed, according to the Canadian Food Guide, were calculated for mothers. Four questions from mothers' FMQs were selected and the responses for each one were dichotomized into two groups. The Kruskal-Wallis H test was used to analyse intake differences between groups.

Results: Of parents recruited (n=2201; 80% mothers), 645 mothers completed FMQs and FFQs (RR=37%). Mean age was 39.3 years (SD=6.05) and mean number of children under 18 years old was 2.15 (SD=0.83). Mothers eating the main meal of the day with their family ≥ 4 days/week versus ≤ 3 days/week had higher VF intake (H=4.53, p=0.033) and no difference in MA intake (H=0.94, p=0.33). Mothers eating breakfast with children ≥ 4 days/week versus ≤ 3 days/week had higher VF intake (H=26.84, p<0.0001) and MA intake (H=10.31, p=0.0013). Mothers spending ≥ 31 minutes having family dinners versus ≤ 30 minutes had higher VF intake (H=3.78, p=0.052), but similar MA intake (H=0.14, p=0.71). Mothers believing eating family meals was important versus mothers having no opinion or not believing it was important had similar VF (H=0.96, p=0.33) and MA intake (H=0.0031, p=0.96).

Conclusions: Results suggest that mothers who frequently eat main meals including breakfast with their children have better dietary habits. Promoting breakfast eaten with children and family meals to Canadian mothers might be a strategy to increase VF and MA consumption among mothers as well as model this behaviour to their children.

P1.63

Reduction of salt addition in meals' preparation among hypertensive women: effects of a motivational intervention

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective: To test the impact of a theory-based intervention to lower salt intake among hypertensive women. The intervention aimed at increasing the women's intention to use no more than 4g of salt/day in meals' preparation by means of improving self-efficacy for adding no more than 4g of salt/day during cooking meals and counteracting the negative influence of the habit of using more than 4g of salt/day during cooking.

Methods: A randomized controlled study was conducted. Hypertensive women were recruited from an academic hospital and a public health care center of a large city in the southeastern part of Brazil. A total of 92 hypertensive women were randomized to IG (n=43) or CG (n=49). At baseline and 3-month follow-up, salt intake was measured by means of questionnaires (discretionary salt, seasoned salt and bouillons, total salt addition, and behavioral question of using no more than 4g of salt/day during cooking) and 24-h urinary sodium excretion; and psychosocial variables (intention, self-efficacy and habit) were assessed. The content of the intervention included activities for improving self-efficacy (guided practice, identification of barriers and coping response and verbal persuasion) and counteracting the negative influence of habit (consciousness raising and counter-conditioning).

Results: In reference to baseline values, at 3-month follow-up IG showed a significant reduction in total salt addition by 3.8g (p<0.001); no significant changes were observed in the control group. Moreover, IG presented a significant increase in self-efficacy, intention and behavior for adding no more than 4g of salt/day during cooking. Regression analyses revealed that the intervention explained 21.5% (p=0.003) of the variance in total salt intake, 42.5% (p=0.0003) of the variance in intention, 20.7% (p=0.0009) of the variance in self-efficacy and 33% (p=0.0004) of the variance in habit. Multiple mediation analyses demonstrated that habit remained the only significant mediator of the relation between intervention and the behavioral question of salt intake, whereas self-efficacy mediated the effect of the intervention on intention.

Conclusions: The findings showed that the motivational intervention was effective in lower salt intake among hypertensive women by means of improving self-efficacy perception and changing the habit of using more than 4g of salt/day.

P1.64

Testing the efficacy of calorie and sodium labelling on restaurant menus on parents' meal selection for their children using an experimental auction.

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: To experimentally test the efficacy of calorie and sodium labelling on restaurant menus on parents' meal selection for their children using an experimental auction.

Methods: An online survey was conducted among 2000 participants age 18+ from Canada with at least one child between the ages of 2-12, and who have eaten food purchased at a fast-food restaurant in the past 12-months. Using a between-groups design, participants were randomly assigned to one of five experimental menus: 1) no nutritional information; 2) calorie amounts only; 3) calorie amounts and a health statement; 4) calorie and sodium amounts, and a health statement; and, 5) calorie and sodium amounts in "traffic lights", and a health statement. Participants viewed 4 Kids' Meal combos on a menu board displaying nutrition information altered according to one of the five experimental conditions. The nutritional quality of the food and beverage items included in the Kids' Meal combos varied in terms of the total amount of calories and sodium. To assess willingness-to-pay, participants were instructed to bid between \$0 - \$7.00 on each of the 4 Kids' Meal combos. One meal was randomly selected as "binding", and participants who bid higher than or equal to the randomly selected price were given a gift certificate for the Kids' Meal plus a cheque for the remaining money they did not use to purchase the Kids' Meal (i.e., \$7 - randomly selected price). Differences in the amount parents' bid for the 4 Kids' Meal combos were assessed across menu conditions using linear regression models including an indicator variable for "condition" and adjusting for covariates.

Results: We hypothesize that bid amounts for the lower calorie and sodium Kids' Meal combos will be relatively higher compared to the higher calorie and sodium Kids' Meal combos, particularly in menu conditions listing both calorie and sodium information.

Conclusion: Menu labelling may improve the restaurant food environment by supporting information transparency, and making nutrition information readily and consistently available at the point-of-sale in restaurants. However, to our knowledge, no existing studies have examined the potential impact of menu labelling on willingness-to-pay among parents' with young children.

P1.65

Knowledge of portion sizes for the 5-a-day fruit and vegetable message distinguish those who are meeting current recommendations from those who are not.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Public health campaigns continue to promote the WHO 5-a-day fruit and vegetable (FV) message, but FV consumption across many Western populations remains low. Research suggests that while individuals are largely aware of the 5-a-day FV message, they are failing to implement it, although reasons for this failure remain unknown. This study aimed to understand the knowledge or lack of knowledge of the message most associated with poor FV consumption.

Methods: A questionnaire was administered across the UK, assessing FV consumption; knowledge of the details of the 5-a-day FV message in terms of what counts as FV; what counts as a portion; and the need for variety; and various demographic variables.

Results: A total of 158 individuals (64 males; age range 16-84 years; from across the UK) completed the questionnaire from Jan.-Dec., 2013. Of these, 155 (98%) individuals had heard of the message, and all those recounting the message (84%) did so accurately. Correct responses to all knowledge questions were low (mean correct responses ranged from 24-60% of questions), but FV consumption was correlated with number of correct responses to questions on all three aspects of the message (smallest $r=0.19$, $p=0.02$). According to self-reports of usual FV consumed, 106 (67%) individuals were not usually consuming 5 FV portions/day. Comparing those consuming less than 5 FV portions/day with those consuming 5 or more FV portions/day, significant differences were found only in response to the portion size questions, where low consumers reported less correct responses ($t(148)=2.24$, $p=0.03$). To look at errors in further detail, low consumers reported less correct responses to questions on fruit, small fruit, e.g. cherries, and large fruit, e.g. melon (smallest $t(148)=1.98$, $p=0.05$), but not on vegetables or composite dishes (largest $t(148)=0.60$, $p=0.55$).

Conclusions: These findings suggest firstly that the details of the 5-a-day FV message are not well known in the UK, and that FV consumption is related to this knowledge. Secondly, these findings suggest that low FV consumption is particularly related to poor knowledge of portion sizes. These findings suggest that strategies to increase FV consumption may benefit from increasing consumers' knowledge of portion sizes.

P1.66

Consumption of commercial energy drinks by children and adolescents: a systematic review of consumer attitudes and associations with health and wellbeing, behaviour, and social outcomes

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective: To examine patterns of energy drink consumption by children and adolescents and any evidence of adverse effects. Energy drinks are non-alcoholic beverages that typically contain high levels of caffeine and sugar in combination with other stimulants. Growing numbers of young people report regular consumption of these drinks, which may lead to caffeine intoxication, sleep disruption, and hyperactivity. There are also likely health implications associated with excessive sugar intake, such as dental erosion and type 2 diabetes.

Methods: A systematic review was conducted, employing an inclusive approach to identify quantitative and qualitative studies investigating the use of energy drinks by children and adolescents. Data sources included nine bibliographic databases, reference lists of relevant studies, and searches of the internet via Google. Two independent reviewers assessed the methodological quality of the studies and abstracted data. Due to the heterogeneity of study designs, contexts and outcomes, the data have been descriptively summarized in a narrative synthesis.

Results: A total of 262 studies were located, with 37 meeting the inclusion criteria - 31 quantitative studies, four qualitative studies, and two literature reviews. The majority ($n=29$) involved subjects aged 11-18 years, although analyses of poison centre data tended to include broader populations. Studies were largely conducted in North America ($n=18$) or Europe ($n=10$), yet all of the qualitative studies were from Australia or New Zealand. None were from the UK. Two-thirds ($n=24$) were cross-sectional surveys exploring i) consumption patterns, attitudes and reasons for energy drink use, or ii) associations with health-related behaviours or effects, including susceptibility to smoking and drug use, sleep problems, and diminished executive functions. A number of key themes emerged from the qualitative studies: the role of branding and advertising; taste as a motivating factor; peer influence; and perceived physiological effects, both negative and positive.

Conclusions: Energy drinks have no known therapeutic benefit and the evidence suggests that they may put some children at risk of adverse health effects. However, taste and youth-aimed marketing combine to ensure their popularity with young consumers. More research is needed to explore the short- and long-term effects of energy drink consumption by children and adolescents.

P1.67

A pilot study investigating the accuracy of the MyFitnessPal app for recording dietary intake.

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose:

Recording dietary intake accurately is a vital process required to improve nutrition. Methods for recording dietary intake such as the food diary need to evolve in line with the advances in technology. Apps such as MyFitnessPal are often used to monitor dietary intake, particularly by those attempting to gain, maintain or lose weight. This pilot study aimed to determine whether the MyFitnessPal app is an accurate method of recording dietary intake compared to the commonly-used 24 hour recall method.

Methods:

Five healthy adults used the MyFitnessPal app to record all food and drink consumed in a seven day period. On two randomly selected days they completed a multiple pass recall online using the NCI Automated Self-Administered 24 hour recall. Participants were not informed of the selected days prior to being asked to complete the recall, and were asked to do so without using the app as an aide-memoire. Intakes of energy, carbohydrate, fat, protein, cholesterol, sugar, sodium and fibre recorded by the app and recall methods, were analysed using a bootstrapped paired-samples t-test in SPSS version 21. Ethical approval was obtained from the Faculty of Business and Enterprise Ethics Committee at Southampton Solent University.

Results:

There was no significant difference between nutrients recorded on the app and by the recall method for energy ($P = 0.562$), carbohydrates ($P = 0.890$), fat ($P = 0.912$), protein ($P = 0.688$), cholesterol ($P = 0.114$), sodium ($P = 0.070$), sugar ($P = 0.756$), or fibre ($P = 0.507$). This pilot study demonstrates that apps may be an accurate way of recording food intake for many nutrients, although a larger-study is required.

Conclusions:

Use of apps potentially offers a more user-friendly and practical method of recording dietary intake compared to other conventional methods. It may be useful for those who are attempting to gain, maintain or lose weight. Use of an app encourages self-monitoring and allows the individual to instantly identify and adjust their nutrient intake. This occurs without requiring the time taken for the information to be analysed by a professional and has the potential to provide a wide-reaching cost-effective intervention.

P1.68

Family Meals and Adolescent Diet in a United States National Survey: Identifying Correlates and Examining the Role of Values and Parenting Practices

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Although adolescents who eat meals with their families have healthier diets, several barriers prevent frequent family meals. In contrast, valuing family meals is associated with family meal frequency and may be a promising intervention target. Using data from a national U.S. panel survey, the NCI Family Life, Activity, Sun, Health, and Eating study, we examined: 1) factors associated with adolescents' eating alone in their family context, and 2) whether the negative association between eating alone and adolescents' fruit/vegetable consumption (FV) is mitigated by family values toward shared eating and parenting practices that support FV.

Methods: Adolescents ($N = 1497$, 50.31% Female, 63.94% White, M age = 14.44) and parents completed Internet surveys and provided demographic information. Multiple regressions examined the role of demographics, family structure, employment, eating alone, family meals values (importance), and parenting practices on FV consumption. Interactions were added in separate models to examine whether values and parenting moderated the influence of eating alone.

Results: In bivariate analyses, eating alone was lower among adolescents who perceived family meals to be important and reported supportive parenting practices ($t_s > 8.00$, $ps < .001$). Older teen age, fewer children in the household, and having unmarried parents were associated with greater eating alone and lower family meals values. Being non-Hispanic White (vs. non-Hispanic Black) also corresponded with greater family meals values. After controlling for demographics, eating alone was negatively associated with FV consumption ($\beta = -.27$, $p < .001$), while values toward family meals and supportive parenting were positively associated with FV consumption ($\beta_s \geq .50$, $ps < .05$). Adolescent FV was also higher among females and those whose parents had a college degree ($ps \leq .001$). However, neither values nor parenting interacted with eating alone ($ps \geq .73$).

Conclusions: These findings provide evidence for multiple correlates of family meals in a U.S. national sample. A lack of significant moderation effects by practices or values suggests that the association between eating alone and adolescent FV may hold across different family contexts. Interventions could consider reducing logistical barriers to family meals in addition to promoting family meals values and supportive parenting.

P1.69

Nutrition education in US elementary schools: not whether, but how - lessons from Great Taste, Less Waste

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Nutrition education is a critical component of health promotion in elementary schools. Yet, across the US, there are many barriers to incorporating it into children's education in ways that are relevant to them and have the potential to positively influence eating behavior. Nutrition is commonly taught as part of the health curriculum by teachers with limited formal nutrition education. Time allotted to the topic is typically constrained by increasing pressures to demonstrate achievement in core subjects. Described here is an innovative approach to address these barriers.

Methods: Great Taste, Less Waste, a classroom-based curriculum for 3rd and 4th graders, was developed and revised with feedback from school personnel. The curriculum, which combined healthy-eating and eco-friendly behaviors, was evaluated in a study conducted from 2010-2013 in 15 middle-income elementary schools in eastern Massachusetts. Project staff consulted with school leaders to ensure acceptability and feasibility of the curriculum overall. Early lessons were piloted in laboratory schools and revised where necessary. Key informant interviews with school personnel before (n=15) and after (n=5) implementation of the main intervention identified potential barriers and proposed solutions. Teachers completed lesson feedback forms and researchers conducted classroom observations to inform curriculum revisions.

Results/findings: The following key strategies emerged for tailoring the Great Taste, Less Waste curriculum to schools' needs: to align content with state and national educational standards; to reinforce other subject areas (math, English, science); to provide attractive, full-color curriculum binders and student workbooks; to streamline lesson content to require little prior knowledge or preparation; to provide suggestions for teachers to customize lessons based on time and interest; and to integrate creative, hands-on activities for students. Teacher and student responses to the curriculum were consistently positive during development and two years of implementation.

Conclusions: Feedback from school personnel was critical to the development of a highly acceptable curriculum. Future efforts may benefit from an interdisciplinary approach that is aligned with state and national academic standards. Attention should be paid to the design and quality of teacher and student materials, and content should be presented in a streamlined format that supports teachers with limited nutrition training.

P1.70

The impact of the Great Taste, Less Waste communication campaign on fruit brought from home to school: lessons for future interventions

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Interventions to increase children's fruit and vegetable intake generally do not address the question of whether messages to "eat more fruits and vegetables" lead to the addition of these foods to the diet or substitution for more calorically dense items. Given the high prevalence of childhood overweight and obesity, this important issue deserves to be addressed.

Methods: Great Taste, Less Waste (GTLW), a nutrition-eco communications campaign for 3rd and 4th graders, was designed to increase fruits and vegetables and decrease sugar-sweetened beverages brought from home to school. It was evaluated in a cluster-randomized trial and compared to a nutrition-only campaign and a control. Primary outcomes were assessed by digital photography at baseline and 7 months later. Analyses presented here focus on the GTLW intervention group, where significant change in fruit from home occurred (+0.18 mean servings, p=0.003). That group included 327 children (mean age 9 years; 55% female).

Results: At baseline, 170 children brought no fruit and 157 brought one or more fruits (mean servings = 0 vs. 1.19, respectively). Greater likelihood of bringing fruit at baseline was associated with white race (OR = 2.7, 95% CI: 1.5 to 4.7), higher household income (OR = 2.5, 95% CI: 1.6 to 4.0), and higher maternal education (OR = 3.3, 95% CI: 1.7 to 6.4). At follow-up, children who brought no fruit at baseline significantly increased their mean servings by 0.51 (p=0.004). No change was observed among those already bringing fruit at baseline (mean servings -0.19, p=0.09). No changes in mean servings of other food items at follow up were observed in either group (-0.01 vs. 0.04, respectively).

Conclusions: The campaign was most effective in motivating children who did not bring fruits at baseline. However, serving sizes did not increase to the level of those who brought fruit at baseline. Fruit added to foods brought from home did not appear to replace less healthful foods. Future interventions should target children who bring little or no fruit from home and strengthen messaging to ensure that fruit replaces unhealthy options.

P1.71

Post-intervention changes in dietary intake of adolescents following the “Healthy Habits, Healthy Girls - Brazil” (H3Girls Brazil) school-based intervention

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: To evaluate post-intervention differences on dietary intake of “Healthy Habits, Healthy Girls, Brazil”.

Methods: The intervention was conducted in 10 public schools from different low-income areas of São Paulo, Brazil. H3Girls, Brazil is a 6-month multi-component, school-based program informed by social cognitive theory with participation of 242 adolescent girls (15.62±0.88 years). The intervention included enhanced Physical Education classes, school break-time physical activity sessions, interactive seminars, handbooks, workshops, PA and food diaries, parents newsletters and text messages to encourage healthy behaviours. Diet was assessed using a validated food frequency questionnaire. Individual foods were categorised into eight food groups of the Brazilian Food Guide Pyramid and percentage contribution to total energy intake was calculated. Descriptive statistics and linear mixed models adjusted for school level were used with significant level of 5%. All analysis followed the intention to treat principle.

Results: Numbers of portions for the intervention group at baseline and post-intervention, respectively, for the following groups were 4.09(95%IC, 3.72 to 4.72) and 3.89 (95%IC 3.59 to 4.19) rice group, 0.91(95%CI 0.74 to 1.08) and 1.19(1.04 to 1.35) veggies group, 0.94 (95%IC 0.73 to 1.15) and 1.36(95% IC 1.18 to 1.55) fruit group, 1.68 (95% IC 1.45 to 1.90) and 1.57 (97% IC 1.37 to 1.77) milk group, 2.76 (95%IC 2.41 to 3.11) and 2.08 (95% IC 1.76 to 2.39) meat group, 1.40 (95% IC 1.40 to 1.60) and 1.26 (95%IC 1.11 to 1.41) beans group, 3.69 (95% IC 3.30 to 4.08) and 2.87 (95% IC 2.54 to 3.19) oils group, 4.41 (95% IC 3.97 to 4.85) and 3.22 (95%IC 2.86 to 3.58) sweets group. There were significant group-by-time effects for milk (mean, -1.55%; IC, -2.74 to -0.35, p=0.01) and beans (mean, 0.37% of calories; IC, 0.01 to 0.73, p=0.04) groups. Other measures did not reach statistical significance (%energy from rice, veggies, fruits, meats, oils and sweets groups).

Conclusions: Girls from intervention group improved their beans and milk groups' intake according to the protocol of H3Girls, Brazil. Further research including more intensive nutrition strategies should be required to evaluate whether dietary intake in adolescents attending schools in developing countries can be optimized.

P1.72

Mediating relationship of gender, campus food store environment, and college students' dietary attitudes and behaviors on their body mass index.

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: What are the mediating factors between the college campus food store environment and young adults' dietary attitudes, behaviors and body mass index (BMI)?

Methods: Based upon Social Cognitive Theory (environment, intentions, behaviors), path analysis with bootstrapping was applied to campus food store environment scores for 13 college campuses and 1138 student participants' dietary attitudes and behaviors and BMI. Height and weight were measured and students completed online surveys. Intention for Healthful Meal Behavior Questionnaire assessed meal intentions. The National Cancer Institute Screeners were used to assess daily fruit (F) and vegetable (V) intake in cups and percentage of calories from fat (% Kcal/fat). Sweetened beverage intake (8 questions) and whole grains (1 question) were also assessed. Grocery and convenience stores were evaluated with a modified version of the Nutrition Environment Measures Survey for Stores (Glanz et al., 2007) to assess healthfulness of foods, availability and acceptability of F/V, and pricing supports (healthier foods cost less). An average of three stores were assessed per campus.

Results: The overall model fit was good with chi-square of 65.897 (n=1138, df =27), p <.001, Comparative Fit Index value of .993, and a root mean square of approximation of .036. After controlling gender, availability of fruit and vegetables separately and pricing supports were positively related ($\beta=.205$, $\beta=.142$, and $\beta=.105$, respectively) and F/V quality negatively related to meal intentions ($\beta=-.268$). Meal intentions was positively associated with total F/V intake and whole grains ($\beta=.278$, and $\beta=.171$, respectively), and negatively associated with sugar-sweetened beverages and % Kcal/fat ($\beta=-.257$, and $\beta=-.220$, respectively). Availability of fruit and vegetables separately and pricing supports were negatively related to %Kcal/fat ($\beta=-.176$, $\beta=-.121$, and $\beta=-.091$, respectively) which in turn, was positively associated with BMI ($\beta=.097$).

Conclusions: Availability of fruit and vegetables and pricing supports for healthy foods in food stores make it easier for young adults to intend to and actually eat well. The negative association with F/V quality could imply that the lower the quality, the more difficult it is for a young adult to plan to eat well. Of the dietary behaviors assessed, the most predictive of weight was fat intake.

P1.73

Comparison of opinions and beliefs about vegetarianism and meat consumption between vegetarian, semi-vegetarian and omnivorous subjects

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: The aim of this study was to investigate and compare opinions and beliefs of Belgian vegetarians, semi-vegetarians and omnivores about vegetarianism and meat consumption. This can allow more targeted health campaigns, since the (animal) protein intake is too high in the Belgian population, and vegetarianism has different health advantages.

Methods: The study was launched in March 2011 in Belgium, using representative consumer panels. A total of 2,436 panel members from the Flemish and Brussels community participated. The study sample was well divided for socio-economic status and gender (1,238 men and 1,198 women participated). An online questionnaire with multiple choice questions about vegetarianism was completed by all subjects participating in this cross-sectional study.

Results/findings: Our results showed that 35.7% of the people do not relate cattle breeding and environment, and 25.2% thinks eating fish is part of a vegetarian dietary pattern. Although only 21.8% of the subjects believed that meat is unhealthy, almost 45.6% of the respondents believed they should eat less meat. Additionally, women agreed more with theorems in favor of a vegetarian diet and less meat consumption than men. In general, vegetarians, semi-vegetarians and omnivores showed a more positive attitude towards their own dietary pattern. Also, 92.1% of the vegetarians believed that meat production is bad for the environment, while only 52.1% of the semi-vegetarians and 19.8% of the omnivores. Vegetarians also more frequently considered vegetarianism as healthy and doable than semi-vegetarians and omnivores.

Conclusions: Given the high meat consumption that exceeds the food based dietary guidelines in Belgium; health campaigns should provide omnivores and men with clear information about the health effects of "vegetarianism" and the impact of meat consumption on the environment.

P1.74

Improvements in selected snack food choices among youth at increased risk of type 2 diabetes participating in a diabetes prevention program

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Type 2 diabetes (T2D) among Canadian youth, especially those of low socioeconomic status, is steadily increasing. Although programs designed to change unhealthy eating practices (a modifiable risk factor for T2D) successfully increase knowledge, how this knowledge influences food choice remains under-investigated. We sought to determine if a diabetes prevention program would positively influence food choices in youth at increased risk of T2D.

Methods: Youth aged 13 to 19 years from two inner city secondary schools were invited to attend the program, which consisted of 16 biweekly sessions. Each session was divided into a 30 minute healthy eating lessons focusing on diabetes prevention, 30 minutes of hands-on snack preparation, and 60 minutes of physical activity. Food choices were documented before the first session and again after the last session using a standardized snack selection test. Briefly, participants were asked to choose one snack item from each of three groups, containing common food items of low and high nutrient density matched by food group and flavour (fruit chews or fresh fruit; enriched or whole wheat crackers; orange drink or orange juice). Differences in the proportion of participants choosing high nutrient dense foods before and after the program were determined using X2 tests.

Results: Thirty-four participants completed both the baseline and final snack selection tests. A significantly higher proportion of participants selected whole grain crackers after completing the program (52.9% before vs. 70.6% after, $p < 0.05$). Although there was no positive impact of the program on the choices of fresh fruit and orange juice, a high number of participants chose these nutrient dense snack options before receiving any nutrition education (79.4% choosing fresh fruit; 79.4% choosing orange juice).

Conclusions: Although the program did not affect choice in two out of the three snack categories, this may have resulted from the high number of participants choosing foods of high nutrient density at the start of the program. Caution should be used when interpreting results from snack selection tests used in a low socioeconomic setting, where access to nutrient dense foods that are typically more expensive and inaccessible may influence choice.

P1.75

Preparing, training, and practicing: Motivations and influences on dietary behavior change among patients preparing for bariatric surgery

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Bariatric surgery has the potential to change weight and dietary behaviors permanently. Research on pre-surgical eating behaviors typically focuses on identifying predictors of post-surgical weight loss outcomes. Less is known about the ways in which individuals prepare for surgery. The purpose of this study was to describe and explain the changes in dietary behaviors that occur as bariatric patients prepare for surgery and to identify the cognitive processes involved.

Methods: Bariatric surgery candidates near the conclusion of their pre-surgery work-up period were recruited to participate in a year-long, mixed methods study. Participants met with the researcher once before surgery and at six and twelve months after surgery. They participated in semi-structured interviews and completed dietary, lifestyle, and health questionnaires at each meeting. Weights were obtained through medical charts or self-report. Pre-surgery interviews focused on present and past eating behaviors, food choices, and dietary patterns. Questions also explored participants' changes in diet, lifestyle, and weight that occurred since becoming a patient at the bariatric clinic. Interview transcripts were coded using the constant comparative method. A constructivist perspective and a grounded theory approach were used to build a conceptual model of pre-surgery dietary behaviors.

Results: Thirty bariatric surgery patients were enrolled. Participants reported a wide range of cognitive and behavioral changes that occurred in the months leading up to surgery. Common themes of change included "Awareness" of motivations and behaviors, "Structure" in eating patterns and food routines, "Better Choices" in foods and nutrient intake, "Portion Size" modification, and an evolving "Relationship to Food." Participants' behavioral changes were influenced by the role food and eating played in their lives, their understanding and interpretations of recommendations and guidelines of the pre-surgery program, their social and work environments, and their expectations for surgery.

Conclusions: Even in a structured pre-surgery program, participants reported diverse behaviors as they prepared for bariatric surgery. Understanding patients' motivations, influences, and expectations can shape educational efforts in this population and advance knowledge of the cognitive processes involved in making dietary change.

P1.76

Mediation mechanisms of reducing sweetened beverage consumption in urban youth

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Mediation mechanism of psychosocial factors on sweetened beverage consumption has not been well reported. The purpose of the current study was to examine mediation effects of theory-based psychosocial variables on sugar-sweetened beverage behavior changes among students who participated in Choice, Control & Change middle school nutrition education intervention.

Methods: Secondary analysis of a cluster randomized controlled trial. Ten middle schools in New York City were randomly assigned to either intervention or comparison condition. Total number of students was 1136, 562 in five intervention and 574 in five comparison schools. The intervention schools received the Choice, Control & Change curriculum that was based on social cognitive and self-determination theories. Sweetened beverage behavior and related psychosocial variables (behavioral intention, outcome expectation, attitudes, self-efficacy, perceived barrier, and autonomous motivation) were measured with self-report questionnaires. The confirmatory factor analysis (CFA) and internal consistency tests were performed to ensure the measurement is valid and reliable. Mediation analysis was performed with a structural equation modeling software (AMOS v.22). Model fit was examined with multiple indices, including the Chi-square, the root-mean-square-error of approximation (RMSEA), the comparative fit index (CFI) and the Tucker-Lewis Index (TLI). Multiple models were constructed to see which psychosocial variables mediated the intervention effects on behavioral outcome.

Results: The CFA and internal consistency tests showed that the data fitted well in the model and are reliable as scales (Cronbach's alpha values ranged from 0.7 to 0.9). The final identified model had Chi-square of 184.893 ($p < 0.001$); RMSEA=0.045; CFI=0.923; TLI=0.836, which indicates a good fit. The model showed that behavioral intention and attitudes were significant mediators for reducing sweetened beverage consumption ($p < 0.05$). An alternative model with an acceptable fit (Chi-square of 229.873 ($p < 0.001$); RMSEA=0.049; CFI=0.900; TLI=0.803) indicated that autonomous motivation mediated perceived barriers ($p < 0.01$), which then influenced sweetened beverage consumption ($p < 0.01$).

Conclusions: Mediation analysis revealed that as intervention students develop behavioral intention and positive attitudes, they reduced sweetened beverage consumption. Additionally, increasing autonomous motivation may help to decrease students' perceived barriers, which may further decreased consumption of sweetened beverages. Strategies targeting these mediators might benefit future success of behavioral interventions.

P1.77

Designing healthier diets: applying a user-centred design approach to develop an innovative mobile application to increase vegetable consumption

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Objective: Mobile applications present a potentially cost-effective and scalable vehicle for delivering effective behavioural nutrition interventions. With the mHealth field still in its infancy, few apps are yet to demonstrate effectiveness or be theory-driven. To address this topic, we sought to apply a user-centred design approach to develop an innovative, theory-driven mobile application to increase healthier eating by creatively applying behaviour change techniques and user insights.

Methods: A user-centred design approach incorporating a three-part mixed methods study guided the iterative development of a mobile application. An interdisciplinary team of researchers, dietitians, and designers engaged in a multi-stage intervention development process consisting of: solution-focused thinking, inspiration gathering, iterative ideation, rapid prototyping, and multiple consultations with the target population. In-depth, semi-structured qualitative interviews were conducted in sequential stages (n=18, 14, respectively) to examine participants' eating behaviours, challenges to eating more healthfully, and impressions of an app prototype. A questionnaire was subsequently administered to examine participants' interest in specific app features (n=35). An applied thematic analysis was used to extract themes, and descriptive statistics were used to analyse questionnaire data.

Results: Participants were 55.6% female and aged 44.2±6.2 years, with 17.0±2.1 years of education and BMIs of 33.1±3.2 kg/m² (mean±SD). Participants expressed an interest in being held accountable, the importance of food tracking in maintaining a healthy diet, and a desire for tracking to be simple and effortless. An app prototype enabling self-monitoring of vegetable consumption requiring minimal effort was considered to be useful, as well as the majority of app features under consideration. An innovative iPhone application to enable vegetable tracking was designed and built and will be presented, incorporating a constellation of theory-informed features to engage users including goal setting, progress monitoring, challenges, and competition.

Conclusions: A mobile application enabling self-monitoring of vegetable intake and requiring less effort than currently available applications may be a well-accepted intervention to support overweight adults in healthier eating. This research illustrates the benefits of applying a user-centred design approach to develop a mobile-based behavioural nutrition intervention with a higher potential for acceptance and effectiveness.

P1.78

Effectiveness of behaviorally oriented nutrition education programs in Russian children.

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: Fruit and vegetable consumption contributes to the prevention of several chronic diseases, but many Russian children do not meet dietary guidelines. There is some evidence that nutrition education programs based on Social Cognitive Theory (SCT) can increase fruit and vegetable intake, but there are few such studies in a Russian context. This study compared a SCT-based interactive classroom and outdoor curriculum emphasizing fruit and vegetable consumption program to an enhanced program that included additional skill-training with healthy snack preparation activities and games. The study was conducted during a summer camp in Northwestern Russia. We hypothesized that nutrition education would be differentially effective between conditions with and without skill training.

Methods: At a summer camp in Northwestern Russia, two classroom groups were assigned to receive either 15 sessions of standard nutrition education with skill-training (intervention) or 15 standard nutrition education sessions (comparison). Before and after the 15 sessions, 20 boys and 20 girls (n=40), aged 8-12y (mean=10.4y; SD=1.0) with mean BMI percentile ± SD=57±27, completed a questionnaire and a snack selection menu task. The menu task had children choose 2 items from list of 3 healthful (nutrient dense) and 3 calorically dense foods, from which they were later served. Independent and paired t-tests (α = 0.05) were performed to assess differences between groups and across time points, respectively.

Results: Both groups showed statistically significant improvement from baseline to post-intervention in healthy snack selection (t=9.5; p<0.001), healthy eating attitudes towards fruit and vegetable consumption (t=3.4; p=0.001), and nutrition knowledge (t=-5.0; p<0.001). No differences across time were found in children's self-efficacy in eating fruits (t=-0.2; p=0.822) or vegetables (t=-1.6; p=0.118). There were no significant differences between intervention and comparison groups for behavior (snack selection), attitudes, self-efficacy, or knowledge (p>0.05).

Conclusions: In the context of a Russian summer camp, nutrition education was effective, with or without skill training, for improving knowledge, attitudes, and behavior. Therefore, health professionals in Russia may wish to consider further research and application in a variety of children's settings to achieve the potential health promoting benefits of nutrition education programs.

P1.79

Exploring differences in theory of planned behavior constructs, dietary variables, and Healthy Eating Index components between artificial sweetener consumers and non-consumers

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Many controversies surround the concept of using artificial sweeteners in place of caloric sweeteners (non-nutritive sweeteners [NNS]) as a means to decrease energy consumption and consequently body weight. This investigation's purpose was to examine variance between NNS consumers and non-consumers for several items: 1) theory of planned behavior (TPB) questions related to sugar-sweetened beverage (SSB) consumption, 2) dietary variables, and 3) Healthy Eating Index (HEI) components.

Methods: Using cross-sectional baseline data from a RCT targeting SSB behaviors, developed using the TPB, adults (n=296) completed validated assessments of beverage intake, SSB TPB-related questions (7-point scale), and dietary intake (3-24 hour dietary recalls). Statistical analyses included descriptives and independent t-tests.

Results: When examining the TPB constructs, NNS consumers (n=99), as compared to non-consumers (197), did not demonstrate significant differences in their attitudes or perception of subjective norms towards SSB consumption. However, NNS consumers had significantly higher perceived behavioral control over reducing SSB consumption (mean difference=0.6+0.2, $p<0.001$), and greater intentions to decrease SSB consumption (mean difference=0.7+0.2, $p<0.001$). Total caloric intake from all foods/beverages (mean difference=227+111, $p<0.05$), calories from SSB and all beverages (mean differences=153+39; 178+43, $p<0.001$), and energy density (mean difference=0.08+0.03, $p=0.02$) were all significantly lower for NNS consumers. However, total beverage fl oz intake was similar for both groups (mean difference 2.5+4.3, $p=0.56$). NNS consumers had increased (i.e., healthier dietary pattern) HEI scores for empty calories, fruits, vegetables, dairy, and total HEI scores (all $p<0.05$). Conversely HEI scores for refined grains and sodium were significantly lower for NNS consumers ($p<0.01$).

Conclusions: These findings suggest that the consumption of NNS provides individuals with a higher perceived ability to reduce their sugar consumption. NNS consumers demonstrated lower caloric consumption from all foods/beverages. Furthermore, overall dietary quality scores, as well as many individual HEI components, were significantly increased for NNS consumers, with the exception of refined grains and sodium, possibly indicating a replacement of sugar with other socially-undesirable foods. Further assessment of compensatory changes in dietary patterns that may occur from NNS intake should be examined in order to assess the potential of NNS consumption to be an effective weight loss/management strategy.

P1.80

Use of Implementation intentions in individual and collaborative approach to reduce salt intake among Heart Failure Patients

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: The purpose of this pilot study was to assess the feasibility and potential effectiveness of the strategy of implementation intentions when delivered individually (only patient) or collaboratively (patient and social referent) on the reduction of salt intake among Heart Failure (HF) patients. The effects on secondary endpoints such as intention, habit and self-efficacy related to the target behavior were also analyzed.

Methods: HF patients attended at primary care clinics were randomized in four subgroups (n=14 each): individual (IIG) and collaborative (CIG) intervention group, as well as individual (ICG) and collaborative (CCG) control group. Total salt intake, the primary endpoint, was calculated based on the sum of the self-reports: discretionary salt, Sodium-Food Frequency Questionnaire and 24-hour recall. All measurements were obtained at baseline and at 2-month follow-up. The intervention consisted at drawing up action and coping plan to reduce salt use during and after meal preparation. One in-person and two phone calls were used of the reinforcements of the plans, in a 15-day interval. For simple comparisons between groups, subgroups and time for the measures of salt consumption, the non-parametric tests, Mann-Whitney and the sum of Wilcoxon Signed Posts, were applied. Generalized Estimating Equations were applied to analyze group differences on salt intake and on psychosocial variables.

Results: Patients in both IG showed a significant reduction in g salt/day intake : IIG: 12.7 x 5.0; OR: 80.17; SE 74.2; IC95%: 13.07; 491.6; $p<0.001$; CIG: 11.4 x 4.8; OR: 94.3; SE 104.3; IC95%: 10.81; 823.13; $p<0.001$ and the control groups showed no difference (ICG: 9.8 x 10.4; $p=.67$; OR: 1.0; SE: 0.43; IC95%: 0.43; 2.33; $p=1.0$; CCG: 14.9 x 14.2; OR: 0.87; SE 0.23; IC95%: 0.23; 3.37; $p=.84$). Additional analysis also indicated that the both IG presented higher scores of intention and self-efficacy and decreased scores of habit at the end of the follow-up and no significant differences were observed in the CG.

Conclusion: This pilot study points to the feasibility and potential effectiveness of the strategy of Implementation Intentions when applied individually or collaboratively on reducing salt intake even in complex clinical settings as those with HF patients.

P1.81

Dietary Habits in British Youth: Differences due to Physical Activity and Weight Status

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: To examine any differences in dietary habits as a consequence of physical activity and weight status in British youth.

Methods: Six Hundred and Thirteen Adolescents, aged 14-16 years, from 5 schools in central England completed the International Physical Activity Questionnaire Long Form and validated measures of dietary intake. Height and mass were assessed from which Body Mass Index (BMI kg/m²) was determined and participants classified as normal weight or overweight/obese based on IOTF criteria. Physical activity levels were classified into two categories (active or inactive) based on a cut off value of 1680 MET min week⁻¹. These cut-offs were employed as the value of 1680 MET min/week⁻¹ is equivalent to 60 min of moderate intensity daily. Data for dietary habits were analysed using a 2 (gender) X (weight status) X (activity level) was MANCOVA controlling for age.

Results: For dietary habits there were significant main effects for gender (p= .0001), weight status (p= .004) and activity level (p= .0001). Girls reported greater weekly frequency of fruit (p= .03) and vegetable (p=.02) intake, whereas boys reported greater frequency of breakfast (p= .0001) and energy drink (p = .0001) intake, compared to boys. Overweight/obese children reported smaller frequency of weekly breakfast (p= .001) but higher frequency of weekly energy drink intake (p= .04) compared to their normal weight peers. Age was significant as a covariate for breakfast intake, with increasing age associated with lower frequency of breakfast intake (p= .01). Children classed as active also reported greater frequency of weekly breakfast (p= .03), vegetable (p= .0001), fruit (p= .00001), milk (p= .034) and energy drink (p= .03) intake compared to inactive peers.

Conclusions: These results suggest that physical activity behaviour cluster with dietary habits in British adolescents and that those adolescents evidencing more positive behaviour in relation to physical activity are also more likely to report more positive behaviour related to healthy eating. It may be that efforts to increase habitual physical activity will also result in other positive behaviour changes including more positive eating habits.

P1.83

Identifying travel mode and trips from raw GPS data: a novel methodology applied to assess exposure to the food environment

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Early Career Award

Purpose: While studies using GPS (Global Positioning Systems) have the potential to refine measures of exposure to the food environment, one challenge is that they do not necessarily represent true environmental exposures, particularly as some time spent outside is in a vehicle, reducing the potential for environmental interaction. The aim of this paper is to present and test a methodology to explore this issue. It presents an algorithm for identifying vehicular trips from GPS data, considers how accurately the method differentiates between transport modes, and reflects on the implications for food environment exposure assessment.

Methods: The method presented is applied on the PEACH (Personal and Environmental Associations with Children's Health) dataset containing the GPS locations of a sample of 688 secondary school (11 to 12 yrs) children in Bristol. An unsupervised computational algorithm based on the Hidden Markov Model is employed in order to infer two transport modes (states), vehicle and non-vehicle, on the basis of trips that have been extracted. Additional criteria are imposed in order to improve robustness of the algorithm. A comparison was made of on-foot or slow cycling exposure to the food environment vs exposure in a vehicle and associations between these measures were examined.

Results/findings: After stripping out noise in the GPS data and motorized vehicle journeys, 82.43% of the initial GPS points remained. After comparing a sub-sample of trips classified visually of vehicle, non-vehicle and mixed mode trips with the algorithm classifications, it was found that there was an agreement of 88%. While the algorithm processing led to lower levels of estimated absolute exposure, the measures of exposure to the food environments of interest calculated before and after algorithm classification were strongly correlated.

Conclusions: Identifying on-foot exposures to the food environment makes little difference to exposure estimates in urban children but might be important for adults or rural populations who spend more time in cars.

P1.84

Attentional bias for breast cancer and heart disease stimuli is moderated by interactions between fear and physical activity or fruit and vegetable consumption.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Women tend to perceive greater risk for breast cancer (BC) relative to heart disease (HD), despite being at greater risk for HD. It is possible that engaging in leisure time physical activity (LTPA) or eating fruits and vegetables (FV consumption) is related to awareness of disease risk and thus moderates attentional bias to disease information. This research measured attentional bias for BC compared to HD words or images and determined if attentional biases were moderated by disease fears, LTPA, or FV consumption.

Methods: Ninety-three healthy women (aged 20 to 71 years) completed visual probe tasks measuring attentional bias for BC compared to HD words and images. Questionnaires measured demographics, fear of BC and HD, LTPA, and FV consumption. Regression models were conducted with attentional bias for words and images as the outcome variables. Predictors were demographics, fear of BC/HD, LTPA groups, FV consumption, and interactions between fear of BC/HD and LTPA groups or FV consumption.

Results: Attentional bias for words was significantly predicted by the interaction between FV consumption and fear of BC, $\beta=.25$, $p=.02$. Participants with low FV consumption and a high fear of BC showed stronger attentional bias for HD over BC words whereas those with low fear showed attentional bias for breast cancer over heart disease words. Participants with high FV consumption and a high fear of BC showed attentional bias for breast cancer over heart disease words whereas those with low fear showed attentional bias for heart disease over breast cancer words. Moderately active participants showed attentional bias for heart disease words over breast cancer words.

Conclusions: Attentional bias for disease-related words is moderated by fruits and vegetable consumption in women who fear breast cancer. Women who consume few fruits and vegetables and are afraid of BC may avoid cancer-related information. Women who have high consumption of fruits and vegetables and also fear BC may seek out information about the disease. Women who are moderately active may be automatically attracted to information about heart disease, but it is not related to fear of the disease.

P1.85

Worksite Policies and Environmental Supports for Healthy Food Access and Physical Activity at Rural and Urban Kansas Worksites

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SIG: Yes, Policies and environments

Awards: No

Purpose: The purpose of this study was to assess the degree to which worksites in rural and urban Kansas support access to healthy foods and physical activity opportunities with workplace policies and environmental changes.

Methods: The WorkWell KS assessment was administered to 204 worksites across 29 communities in Kansas. Worksite wellness coordinators, CEOs, and other executives at each worksite completed the 120-item assessment to provide a snapshot of how thoroughly the worksite addresses healthy foods and physical activity, and how frequently the worksite uses policies and environmental strategies. A total of 6 items addressed healthy foods policies and environmental strategies, and 11 items addressed physical activity policies and environmental strategies. A two-sided t-test was conducted for each of the policy and environment items for healthy foods and physical activity to ascertain significant differences between rural and urban communities.

Results: There were significant differences between rural and urban communities for 5 of 17 healthy foods and physical activity items. Urban communities were more likely than rural communities to have policies supporting flex-time scheduling to accommodate physical activity ($M_1=30\%$, $M_2=14\%$, $p=0.018$), to have written policies supporting access to healthy foods ($M_1=9\%$, $M_2=2\%$, $p=0.029$), and to support a produce exchange or farmers' market ($M_1=30\%$, $M_2=13\%$, $p=0.013$).

Conclusions: The significant differences between rural and urban worksites suggested a greater need for policy and environmental supports for healthy foods and physical activity in rural worksites. It is likely that urban, and often larger, worksites might be benefiting from economies of scale that are not possible for worksites in rural communities.

P1.86

Teacher Perceptions of Physical Education in North Carolina-Based Head Start Preschool Classrooms

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SIG: Yes, Early care and education

Awards: No

Purpose: Exposure of preschool children to physical activity is crucial for achieving higher academic standards, improving motor skills, and preventing obesity. Teachers play a pivotal role in assuring children receive adequate exposure to physical activity. The purpose of this research was to investigate Eastern North Carolina Head Start (HS) preschool teachers' perceptions of PE in the classroom.

Methods: Researchers conducted in-depth, structured interviews in May-June 2014 with HS preschool teachers. Interviews were transcribed, coded, and analyzed for the presence of recurring themes following phenomenological methods and the theory of IMB (Information, Motivation, Behavior).

Results/Findings: Content analysis indicated PE occurs both formally (planned, structured) and informally (impromptu, casual), totaling to a minimum of one hour each day (only requirement known by every teacher interviewed). Guided by the IMB theory, researchers identified the presence of informational (e.g. knowledge of PE for preschool children, confusion between PE and nutrition education), motivational (e.g. value placed on health, childhood obesity prevention), behavioral (e.g. ability to integrate PE into academic lessons), and environmental (e.g. limited resources/space/time, unengaged parents, limited child attention span) factors affecting preschool teachers' ability to effectively teach PE in the preschool classroom.

Conclusions: Findings indicated teachers may need additional training related to PE with an emphasis on PE requirements and clarification of the difference between PE and nutrition education. Alternatively, emphasizing the importance of PE and its ability to significantly impact the health of preschool children may enhance teachers' motivation to conduct PE more frequently. Addressing potential barriers (e.g. limited resources) and increasing facilitators (e.g. content integration) under the IMB theory may improve teachers' ability to successfully incorporate PE in the preschool classroom. Results will be used to inform future PE interventions in the HS preschool classroom. Understanding teacher-related factors as it's related to the IMB theory may improve young children's long-term health-related behaviors through increased access to quality PE.

P1.88

The National Early Care and Education Learning Collaboratives (ECELC) Theory of Change: A model to contribute to national efforts in the United States (US) to prevent childhood obesity

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SIG: Yes, Early care and education

Awards: No

Purpose: To describe a multi-state implementation model to change nutrition, physical activity, screen time, and breastfeeding support policies and practices in early care and education (ECE) settings as an obesity prevention strategy for young children (ages birth to 5 years old).

Methods: The National Early Care and Education Learning Collaboratives (ECELC) Project is currently being conducted across nine states in the US. The overarching model guiding this initiative was derived from work that Nemours Health System began in Delaware. This original work utilized a collaborative, leadership team approach, with "active" components including, learning sessions, action planning, and technical assistance. The original model was adapted for ECELC and draws from a Social Ecological framework, including constructs from Social Cognitive Theory (e.g., social support, goal setting) to change environments (i.e., early childhood settings) to promote more healthful behaviors (e.g., improved nutrition and physical activity) among children birth-five.

Results: This model includes various inputs (e.g., multiple partners, program materials, financial resources), activities (e.g., state-level engagement & ECE program-level recruitment and engagement, such as learning sessions, peer support, action periods, technical assistance), and outputs, to promote short-term, intermediate, and long-term outcomes. The project is conducted across five learning sessions and includes follow-up supports. Preliminary pre-post results from the first cohort of 6 states across the US encompassing 434 ECE programs are promising with regard to self-assessed changes in nutrition, physical activity, screen time, and breastfeeding support policies, practices, and environments.

Conclusions: This model incorporates previously successful components and strategies and has an overarching strong theoretical base. This model can be applied to early childhood or other settings to promote dietary and physical activity changes and ultimately contribute towards national, state, and local level obesity prevention efforts in the US and elsewhere.

P1.89

Identifying strategies to reach adults of Turkish and Moroccan origin for health checks and lifestyle advice: a mixed-methods study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Low participation rates among ethnic minorities in preventive healthcare services are worrisome and not well understood. The aim of this study was to identify how Turkish and Moroccan adults living in the Netherlands can be reached to participate in a health check for cardio-metabolic diseases and follow-up (lifestyle) advice.

Methods: A mixed-methods approach was used with a convergent parallel design, to combine data from one quantitative study and three qualitative studies. The target group consisted of adults of Turkish and Moroccan origin aged 45 years and older. Questionnaire data was available for 311 respondents. Fourteen focus groups and five individual interviews were conducted among the target group. Additionally, eight focus groups were conducted among young Turkish and Moroccan adults (up to 45 years old) with questions about reaching their parents.

Results: When offered a health check, 85.1% of the Turkish respondents and 71.3% of the Moroccan respondents indicated that they would be either 'maybe' or 'definitely' willing to participate. In general, participants of Turkish and Moroccan origin shared similar ideas about requirements to reach them. Key issues regarding reach for a health check were: strengthening relevance of participating; involving GPs in inviting the target group; filling out the health check questionnaire at the GP's office or at home; overcoming language barriers; and addressing financial cost of participating. Regarding reach for follow-up (lifestyle) advice, key issues were: making advice personally relevant; providing advice at the individual level in case of personal matters; providing advice via either a doctor or a specialised health professional; and mixed feelings regarding ethnic-matched professionals and preferred language.

Conclusions: To reach adults of Turkish and Moroccan origin for a health check or (lifestyle) advice, it is important to stress the relevance to them, consider the involvement of the GP and take cost concerns into account. Providing information in their native language, possibly by involving ethnic-matched professionals, might be needed to overcome language barriers. These strategies might help (health) professionals to improve the reach of Turkish and Moroccan adults for preventive healthcare services.

P1.90

Closing the gap between needs and wishes - Using Goal Attainment Scaling (GAS) for better participation and quality management in projects to promote physical activity and nutrition

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Interventions in physical activity and nutrition suffer from «hard facts» on the one hand and subjective interests and wishes of the target group [...] on the other. The gap between these positions affects the acceptance of health projects and the quality of interventions. Eight public health offices in the project «Healthy Community - Round Tables for regional health promotion in Bavaria, Germany» were asked to use the Goal Attainment Scaling in order to respect subjective needs and to ensure participation. They are all mainly focusing on physical activity and nutrition.

Methods:

A goal attainment scale measures the success of interventions on a five-level scale with gradation from much more (+2) to much less than (-2) the expected outcome in order of self-evaluation. Every stage of the scale is spelled out in correspondence to the expected outcome. The whole process of identifying goals, expressing the scale, proceeding the evaluation and reflecting the results is intended to be in participation with the target groups and stakeholders. Round Tables can be one way to involve the target group into planning and monitoring of the intervention.

Results:

The opportunity of participation varies between very low influences to a high level of decision-making regarding the intervention: Two health departments used the Goal Attainment Scaling as a non-participatory approach for quality management in the intervention.

As a preliminary stage of goal attainment scaling six health departments discussed the milestones at the Round Tables. One public health offices spelled out the scale in a cooperative way. Just one health department reflected the results together with the target group.

Conclusion:

Participation is an important factor to gain acceptance for interventions in health promotion. Using Goal Attainment Scaling as a tool for participation seems to be a challenge in the process of intervention planning. The methodological claim is high and its handling has to be introduced to all actors. Focusing on main goals which are important to all actors is a good way to reduce the organizational expense. At highly committed Round Tables, responsibilities for the evaluation process can also be distributed to members to relieve the project manager.

P1.91

The association between diet, physical activity and student achievement

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objectives: Although health and education are interconnected, the mechanisms that contribute to this relationship are not well understood. Considering the increasing emphasis on physical activity and nutrition in schools, further explication of the interactions is needed to support investment and implementation of healthy school initiatives. The purpose of this presentation will be to examine the relationships between physical activity (PA), nutrition and academic performance from a research study on school and student well-being in Nova Scotia (Canada).

Methods: Our population-based study included students in grades 4-6 (about 9-12 years old) across 18 schools in a rural school board. Diet Quality Index (DQI) and PA were assessed through validated student surveys. Responses were grouped into tertiles and used to quantify students' DQI and PA scores. Academic performance measures were obtained directly from the school board for Mathematics and English Language Arts (ELA). Grades were dichotomized with a grade "C" or "D" being considered poor academic performance. Associations between health behaviours and academic performance were assessed using multilevel logistic regression with average school grades as a school-level covariate.

Results: The survey response rate was 49%. Data from 599 students were used for the analysis. Students in the highest tertile for DQI and PA were less likely to have a poor academic performance in Mathematics than students in the lowest tertile (OR 0.40, 95%CI 0.22-0.75 and OR 0.54, 95%CI 0.31-0.97, respectively). There was a trend toward better achievements in ELA for students in the highest compared to the lowest tertile for DQI (OR 0.42, 95%CI 0.15-1.15).

Conclusions: This research contributes to our understanding of the relationship between PA, nutrition and academic performance. Our results suggest that sustained investment in healthy school initiatives that produce improvements in students' diet quality and PA may help to enhance students' academic scores. These findings are particularly policy relevant to education decision makers in Nova Scotia, where provincial academic scores are consistently lower than the rest of the country. Further analysis will explore school-level differences to shed light on strategies to support improvements in both health and academic outcomes.

P1.92

An examination of the effects of a large Canadian workplace wellness initiative on health-related behavioral outcomes

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SIG: Yes, Policies and environments

Awards: No

Purpose: Recent reviews have provided support for the conclusion that evidence-based workplace wellness programs are associated with positive health and financial outcomes (e.g., Goetzel et al., 2014; Rouse et al., 2014). Currently, limited research exists on the effectiveness of workplace health promotion programs in Canada. The purpose of the current study was to examine the effects of a comprehensive Canadian workplace wellness initiative on employees' self-reported health behaviors (i.e., strengthening exercises, fast food intake, smoking, fruit and vegetable consumption, and moderate-to-vigorous physical activity) from baseline to mid-program (i.e., one year).

Methods: The two-year Sun Life - Ivey Canadian "HealthyRETURNS" Wellness Program is currently being implemented at five companies (seven sites) across Canada. Program components include: a manager webinar; two health screening clinics; a stress management webinar; a one-month fitness challenge; four 30-minute telephone health coaching sessions; four self-directed online nutrition sessions; and a fitness webinar. To date, participants have completed online wellness surveys at baseline and one year.

Results: Participants included 171 male employees and 193 female employees ($M_{age} = 44.1$, $SD = 9.6$). Participation rates for the intervention initiatives ranged from 3% to 75%. Shifts in marginal distributions of self-reported health behaviors were examined using Bhapkar's test statistic (e.g., Dunnigan, 2013). Significant changes were observed for weekly frequency of strengthening exercises and consumption of fast food. Specifically, the proportion of employees who "never or rarely" engaged in strengthening exercises decreased, while those who "sometimes" or "usually/always" engaged in this form of activity increased from baseline to one year. In addition, the proportion of employees who consumed fast food "<1 day/week" increased, whereas those who consumed fast food "1-2 days/week" or "3-5 days/week" decreased over time. No significant changes were observed for fruit and vegetable consumption, moderate-to-vigorous physical activity, or smoking, although all shifts in distribution were in the expected direction.

Conclusions: The findings provide preliminary evidence for the effectiveness of a large-scale workplace wellness program in relation to self-reported engagement in strengthening exercises and consumption of fast food. Employee participation rates have been identified as an area for improvement for the remainder of the study.

P1.93

The relationship between sleep quality and duration, and childhood obesity: Analysis from the WAVES study

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective:

There is much evidence of a relationship between short sleep duration and obesity, though whether this is causal, and potential causal mechanisms, remain under debate. Sleep patterns and sleep quality may be contributory factors, but have rarely been studied. We examine the relationship between sleep patterns, quality and duration and childhood overweight, using data from a childhood obesity prevention trial.

Methods:

We undertook cross-sectional analysis of baseline data from the multi-ethnic West-Midlands ActiVe lifestyle and healthy Eating in School children (WAVES) study. BMI, calculated from objective measurements, was available for 1471 children aged 5-6 years. Sleep data were collected using a parental questionnaire, which included Children's Sleep Habits Questionnaire domains. Multivariable models were constructed (adjusted for ethnicity, age, gender, socioeconomic status, TV viewing time, physical activity and 24-hour energy intake) for each measure of sleep, with BMI z-score as the outcome.

Results:

Sleep parameters varied by sex and ethnicity. Sleep duration was longer in girls compared to boys (mean difference 8 mins, $p < 0.01$) and in white British compared to South Asian (mean difference 17 mins, $p < 0.001$). Sleep problems were also more common in South Asian children (score difference = 3.7; $p < 0.001$). Increased sleep duration was associated with lower BMI-z score in unadjusted models, particularly at weekends ($\beta = -0.10$; 95%CI -0.20, -0.01), suggesting that for each extra hour of sleep at the weekend, the BMI z-score would be lower by 0.1 units. However the association was non-significant in fully adjusted models (for weekends: $\beta = -0.08$; -0.18, 0.03), apart from the South Asian sub-group of children ($\beta = -0.29$; -0.51, -0.07, $p = 0.012$). None of the other sleep parameters were significantly associated with BMI z-score.

Conclusions:

Sleep patterns, quality and duration differ by subgroups in children. Overall, the relationship between sleep parameters and obesity were non-significant, when adjusted for all potential confounders. However, among South Asians, for each one hour reduction in weekend sleep duration, BMI z-score increased by 0.29. Studies to explore potential mechanisms need to consider sex and ethnic sub-group differences, and thus inform future trials.

P1.94

Sons of the West: Evaluation of a men's health promotion program delivered by an Australian Rules Football Club.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: The Sons of the West health promotion program was designed to promote health among men in the western region of Melbourne and was the first of its kind in an Australian context. The evaluation was designed to assess changes in participants' health and document the implementation of the program.

Methods: A total of 713 males (age = 43.5 ± 12 years) registered in the program and 316 completed final health assessments. The 12-week program involved weekly health information workshops and physical activity (PA) sessions offered via local councils and workplaces and several additional program social events. A pragmatic approach to research was utilized, incorporating both qualitative and quantitative measures of health, PA, nutrition, mental health and social connectedness. Focus groups, interviews, objective health assessment and questionnaires were used to assess perceptions of the program and health changes. Primary outcome variables included participation, health awareness, PA and social connectedness.

Results: Participation was strong and consistent among participants who attended council (67% completed) and workplace (72% completed) sessions. Adherence dropped to 27% for those who did not engage in face-to-face program activities. Qualitative analyses indicated participants felt high levels of belonging and commitment to the program and other participants. There was also a strong increase in health awareness and engagement. This was supported by increases in physical activity (mean increase of 30 minutes of moderate-vigorous physical activity per week) and self-reported health (12% increase in those reporting 'good/excellent' health). It was important to acknowledge men's preferences for health initiatives. Perceived similarity among participants was also a strong incentive for initial and ongoing participation in the program.

Conclusions: Several features of this program appealed strongly to men who are typically disengaged from their health and can be replicated in other settings. Social connectedness and support appeared to facilitate improvements in health outcomes.

P1.95

Amount of guidance in a combined lifestyle intervention to improve lifestyle of overweight people: the more, the better?

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Improving physical activity and dietary behaviour of overweight and obese adults is of increasing interest. Current combined lifestyle intervention is embedded in primary care and is aimed at improving physical activity and dietary behaviour in overweight and obese adults. The one-year intervention comprises guidance by a team of a lifestyle advisor, physical therapist and dietician which can vary in intensity. We studied the influence of the amount of guidance on improvement in physical activity, sitting time and body composition.

Methods:

Participants (n = 411) in 29 GP practices reported the amount of moderate to vigorous physical activity (MVPA), walking and sitting every six months by means of the short version of the International Physical Activity Questionnaire (IPAQ). Moreover, we measured BMI at baseline, after the one-year intervention and after two-years of follow-up. Three-monthly participant reports of attendance with lifestyle advisor, physical therapist and dietician were used to indicate amount of guidance. Three-level mixed models were used to study the influence of attendance with lifestyle advisor, physical therapist and dietician, whilst accounting for clustering and repeated measures.

Results:

Within the first six months sitting time decreased with 40 minutes (10% of baseline), and after 1.5 and 2 years participants increased walking time with 15 and 12 minutes compared to baseline (respectively 34% and 27% of baseline). Amount of MVPA did not change. BMI was decreased with 1.1 kg/m² one year after the start of the intervention and this improvement was still visible at two years after the start. Number of attended meetings with lifestyle advisor, physiotherapist and dietician did not influence the changes in physical behaviour. A higher number of lifestyle advisor meetings was associated with a larger decrease in BMI (r = -0.35).

Conclusions:

Physical behaviour and BMI showed favourable changes after the start of the BeweegKuur. The changes in physical behaviour were independent of the amount of guidance. The change in weight was significantly related to a higher attendance of meetings with the lifestyle advisor, suggesting that intensive guidance by lifestyle advisor is necessary for clinically relevant weight loss.

P1.96

Mindfulness-based Pilot Study to Reduce Childhood Obesity Risk in Underserved New York City School-age Youth: Intervention Overview and Process Evaluation

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Urban youth residing in low-income communities have higher obesity rates and elevated environmental stressors compared to economically-advantaged peers, which can result in long-term emotional and physical problems. A mindfulness-based program incorporating physical activity, nutrition, and stress reduction could provide a unique opportunity to decrease obesity risk and improve overall health of this at-risk population. The purpose of this research was to conduct a process evaluation to measure fidelity and acceptability of a mindfulness-based pilot intervention focused on reducing obesity risk in school-aged children residing in a low-income New York City neighborhood.

Methods: A quasi-experimental study was conducted with children attending a Harlem, NY-based school. School children participating in the afterschool program comprised the experimental group (n=25), while those not participating in the program, comprised the control group (n=24). A 10-session mindfulness-based pilot intervention, guided by Social Cognitive Theory, was developed. Each session, which was offered once a week, was two hours in duration and was comprised of three components: yoga, mindful eating, and mindful breathing. Process evaluation such as fidelity and reach were measured throughout the intervention. Brief interviews with a subsample of the experimental group were conducted to determine acceptability and perceived impact of the pilot program.

Results: Participating children were fourth and fifth graders (aged nine to 12 years) and 80% were African-American/Black. On average, children attended 80% of the sessions. Nine out of the ten planned sessions were implemented. 75% of the mindful eating component, 50% of the yoga component, and approximately 40% of the mindful breathing activities were implemented successfully. Majority of the children enjoyed the program and thought it could be useful for other youth.

Conclusion: Overall, most aspects of the intervention were successfully implemented and the activities were delivered as intended. As prevalence of childhood obesity remains high, it is important to seek innovative and wide-reaching approaches to connect with children. Thus, a comprehensive mindfulness-based program could provide a unique opportunity to engage and impact overall health of underserved, urban school-aged children.

P1.97

'Clubs are opening their gates to the community': the impact of health promotion through sport in Irish GAA clubs

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SIG: Yes, Policies and environments

Awards: No

Purpose: The sports club has been identified as a new setting for health promotion. In Ireland, a Gaelic Athletics Association (GAA) sports club exists in almost every community with a remit that extends beyond promoting gaelic games. The purpose of this analysis is to present the impact and experience of clubs who have taken part in a pilot phase of a Healthy Club Project in GAA clubs in Ireland.

Methods: 16 clubs undertook a self-evaluation of their club and completed a healthy club index (HCI), adapted from Kokko et al., (2009), at baseline and follow up. Club representatives also took part in focus groups at both time points to describe the process, and outcomes of engaging in health promotion through sport. Quantitative analysis was carried out using SPSS and qualitative data was processed using thematic content analysis.

Results: Data from the HCI revealed that clubs showed improvements over time, particularly in a policy and education context, with less positive outcomes observed for health promotion in coaching activities. All clubs implemented approximately five initiatives specific to the needs of their community that led to increases in awareness, skill development and behavior change. Club representatives also noted improvements in relation to membership and community engagement. Acquiring funding and recruiting support to implement and sustain health promotion activities in the club were the main challenges experienced in this pilot phase of the project.

Conclusions: This analysis confirms that GAA sports clubs are a viable setting for health promotion. Importantly, the impact of this activity is extending beyond the club, to the extent that it is being most effectual in the general community. The need to integrate health promotion into coaching and other day-to-day activities of the club remains important. Clubs also require support; from internal and external sources to ensure health promotion activity is sustained over time.

References

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P1.98

Health and lifestyle behaviours and metabolic risk factors of English University students: clustering of behavioural and metabolic risk factors.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: International research demonstrates that university students readily engage in riskful health and lifestyle behaviours (El Ansari et al., 2011). Limited research has examined the health and lifestyle behaviours of UK students (Faulkner et al., 2006). The purpose of this study is to conduct a cross-sectional analysis of the health and lifestyle behaviours and metabolic risk factors of a sample of British university students.

Methods: One hundred and ninety students from a West Midland university (mean \pm SD: age 21.22 \pm 5.02) completed a questionnaire to quantify participation in a range of health and lifestyle behaviours including physical activity (PA) and dietary behaviours. Blood pressure, blood measures of HDL-CHO, LDL-CHO, triglycerides and fasting glucose, waist circumference, stature and mass, allowing for BMI to be calculated, were also measured in a sub-sample of students (n=42) to identify metabolic risk factors. Health and lifestyle behaviours and metabolic risk factors were compared against published guidelines to ascertain the prevalence of these behaviours and risk factors in the population.

Results/findings: Initial descriptive analysis of the data revealed 46.3% of the total sample did not meet current PA guidelines and that 72.2% of the total sample did not meet current recommendations for daily fruit and vegetable intake. 18.9% of students were found to be overweight and 5% of students were found to be obese.

Conclusion: This study indicates that riskful health and lifestyle behaviours are prevalent in a sample of British university students. Combining self-report measures of PA and diet with objective measures of metabolic risk has provided novel insight into the health and lifestyle practices, and prevalence of metabolic risk factors in a sample of British university students. Further research is needed to develop understanding of the health and lifestyle behaviours of students studying in other parts of the UK. A broader understanding of the health and lifestyle behaviours of British students can be used to inform the development of interventions that support students to adopt health promoting health and lifestyle behaviours.

P1.99

Competences of coaches in combined lifestyle interventions: a mixed methods study

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: Facilitator-led combined lifestyle interventions (CLIs) have shown to be effective in changing and maintaining behavioral lifestyle changes and reducing overweight and obesity. It has been demonstrated that lifestyle coaching, as part of facilitator-led CLIs, contributes to a shift towards a more autonomous motivation for physical activity. This is necessary for sustainable behavior change. Due to the complexity of lifestyle-related diseases, an integrated approach is required. A lifestyle coach (LC) is expected to enable lifestyle-related changes, in adults as well as children, by applying autonomy-supportive coaching strategies and by engaging in entrepreneurship and intersectoral collaboration in order to facilitate healthy behavioral choices. The present study examined the required competences of LCs to support participants in changing and maintaining healthy dietary and physical activity behaviors for the development of a conceptual framework.

Methods: The present study will apply a mixed-methods approach. Seven LCs in three different regions in the Netherlands, have completed a quantitative questionnaire including competences (i.e. leadership styles, cross-sector collaboration, network skills, coaching styles, adaptive management, and motivational interviewing), work engagement, and personality. Semi-structured interviews have been conducted with the LCs to gain in-depth insights in necessary skills, and network analysis will be executed in order to evaluate intersectoral collaboration. The study is based on the theoretical tenets of the Behavioral Change Ball (Hendriks et al., 2013).

Results: The study is currently ongoing and the results will be presented. The conceptual framework will guide the distinction of two central LC behaviors (coaching of participants and entrepreneurship) and their determinants (divided over the concepts of motivation, capability and opportunity).

Conclusions: The results of the present study can be used to inform the examination and training of skills of lifestyle coaches in facilitator-led CLIs.

P1.100

The Québec Experience in obesity prevention: 15 years at a glance

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: since the emergence of obesity as a public health problem in the province of Québec in the early 2000s, important and incremental efforts have been devoted to its prevention. After a 6-years Governmental action plan (GAP) and a 10-years public-private \$400 million investment in healthy lifestyles promotion, where do we stand? This work provides a snapshot of the efforts committed at a crucial moment of renewal of the National public health programme.

Methods: to get this overarching perspective, we reviewed three different sources: (1) evaluation reports from Québec governmental, non-governmental and academic groups including data on GAP accountability and implementation, other obesity-related policies, regional intersectoral efforts and various case studies on regional and local actions; (2) diet, physical activity and weight-related population-based surveillance data; (3) international recommendations on healthy eating and physical activity promotion.

Results: in the GAP, out of 75 actions initially planned, about 90% had been initiated or completed in 2012. However, intersectoral collaboration has proven to be a challenge because of ministerial work in 'silos'. Political and administrative supports at the highest levels were critical in setting cross-governmental committees and in maintaining an acceptable level of engagement from the 11 ministries and organisations. Similar observations have been made at the regional scale. At community level, the funding of a myriad of actions targeting youth across the province through *Québec en Forme* has been essential, but sustainability is an issue. Surveillance data suggest a slowing down in the growth of overweight prevalence in some categories, but this has to be confirmed overtime. In any case, much is still to be done to improve diet and physical activity-related behaviours in the population, but a patent lack of impact evaluation makes the identification of successful interventions difficult.

Conclusion: when comparing the 15-years Québec experience in obesity prevention to current international recommendations, it appears crucial to maintain on-going intersectoral efforts. Further resources should be devoted to evaluation and new interventions may be considered such as stronger public policies to change the built environment, school health promotion policies, and incentives to improve healthy food availability.

P1.101

Mothers' perspectives on obesity prevention behaviors for 2-5 year-old children

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SIG: Yes, Children and families

Awards: No

Purpose: Life-long food preferences and eating and physical activity behaviors are instilled during early childhood and therefore, mothers play a critical role in childhood obesity prevention. The primary purpose of this study was to conduct focus groups to learn about mother's perspectives on feeding behaviors and monitoring of physical activity for children ages 2-5. The secondary purpose was to inquire about the division of the roles and responsibilities related to feeding and eating within the household.

Methods: Participants were recruited from childcare centers and healthcare practices in Columbus, OH. A total of five, ninety-minute focus groups were conducted, each with 3-7 mothers. Demographic data was collected from participants including: child age, sex, race, and insurance status; mother's age, sex, education, occupation, and the number of individuals living in the home. Focus group questions inquired about the perceptions of their child's growth, eating behaviors and routines, physical activity, personality, and the mother-child relationship. The focus groups were transcribed and then analyzed using a Grounded Theory framework. Key phrases and coding categories were identified and constructed into themes. Further analyses were conducted to compare participant responses based on race and child gender.

Results: Nineteen mothers participated in the focus groups. Fifty percent of mothers had a male child between 2-5 years old; 10 mothers identified as Caucasian, 7 African American, and 2 Indian. Results indicated that mothers sought guidance about how their child is growing from family members or their pediatrician. Mothers whose children attend a childcare center tended to follow a similar eating schedule to the center at home. Mothers mentioned guilt associated with the lack of or abundance of food their child consumes. Mothers detailed larger cultural and social challenges such as time management, having multiple children, food advertising targeting their children, and the types of foods served at community celebrations.

Conclusions: Mothers play an important role with young children by providing a foundation for healthy eating and physical activity behaviors. Interventions targeting mothers about how to build a foundation in this area, that is respectful of culture and time restrictions, should be a top priority for childhood obesity prevention.

P1.102

Applying the mediating moderating variables model to identify behavioral targets for Ontario, Canada's Healthy Kids Community Challenge

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: The Ontario Healthy Kids Community Challenge (HKCC) is a community-based, government-led intervention to reduce obesity and overweight and improve health behaviors among children and youth. The HKCC involves a provincial-wide social marketing campaign to target child and youth behaviors related to healthy eating, physical activity and sedentary behavior, and sleep. This presentation will provide an overview of the process by which behavioral targets were identified to recommend as themes for the HKCC social marketing campaign.

Methods: The mediating moderating variable model (MMVM) was applied to identify behavioral targets from each behavioral category. The MMVM was also used to identify mediators of behavioral targets to recommend as health communication content. A Scientific Reference Committee (SRC) was convened to participate in a consensus-building process. SRC members participated in working groups according to their content expertise. Working group members individually recommended the three most modifiable and causal behaviors influencing their behavior category (e.g., healthy eating), and the mediators associated with those behaviors (e.g., parental cooking skills). The responses were then summarized and collated using a point system to rank behaviors within each category. A teleconference was held with each working group to: 1) reach consensus on behavioral targets to recommend as themes for each category; and, 2) clarify the mediators for those behaviors. Clarified behaviours and mediators were brought to the full SRC for discussion and approval.

Results: Seven behavioral targets were identified and recommended to government to inform HKCC social marketing themes. These behavioral targets are: increasing active transportation, increasing active outdoor play, decreasing screen time, decreasing sugar-sweetened beverage intake, increasing fruit and vegetable intake, implementing healthy eating routines, and ensuring adequate sleep duration. The mediators associated with these behavioral targets were also identified and conveyed to government as potential content for their social marketing materials and to inform potential community-led interventions.

Conclusions: The MMVM was useful to guide the identification of behavioral targets and mediators for the HKCC social marketing campaign. Applying this model allows for a better understanding of how the HKCC can change health behaviours and can improve overweight and obesity in Ontario children and youth.

P1.103

Texas GROW! EAT! GO! Using Family-focused Garden, Nutrition and Physical Activities to Prevent Childhood Obesity: Cohort 1 Child and Parent Results

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: The Texas! Grow! Eat! Go! project focuses on decreasing childhood obesity among 3rd grade students. Results will be presented from Cohort 1 child and parent data which assessed the independent and combined effects of 2 school-based interventions: a school-garden and nutrition program, *Learn! Grow! Eat! Go!*, and a physical activity program, *Walk Across Texas*, with *CATCH* as control on children's diet and physical activity behaviors and body mass index (BMI). The study is funded by USDA, Agriculture and Food Research Initiative, Grant no. 2011-68001-30138.

Methods: This is a 5-year randomized controlled trial with 4 treatment groups. Sixteen low-income schools in four areas of Texas (n= 734 children; 560 parents) participated in Cohort 1. Child and parent measures developed specifically for this study population included behavioral outcomes (i.e. diet, physical activity, and gardening), psychosocial variables related to these three behaviors, knowledge, and demographic data. Pre- post-intervention and one year follow-up data was collected from children and parents, included child BMI. Parent data included health status and parent participation in interventions. Process evaluation data included teacher implementation data, teacher and administrator attitudes and institutional features, and Extension agent and volunteer attitudes and actions.

Results: Child demographics showed 45.63% Hispanic, 18.79% African American, 15.74% Caucasian, 4.77% American Indian and 15.5% other. Behavior changes included: increased self-efficacy to consume health beverages, reduced consumption of sugar sweetened beverages, increased healthy family meal practices, and increased knowledge about plant science and nutrition. Combined treatment effects indicated significant increases (0.0001) on vegetable exposure and preference; decreased screen time (0.001); increased moderate (0.0007) and vigorous physical activity (0.001); and selection of fruit juice over soda (0.01).

Conclusions: Data indicated that the combined treatment: *CATCH* + *JMG* + *WAT* resulted in more positive changes in vegetable exposure & preference, physical activity behaviors in children and with parent involvement. Mixed effects were found for children classified as overweight or overweight & obese: % obese & obese/overweight decreased for *CATCH* & *CATCH* + *JMG*; & obese/overweight decreased for *CATCH* + *WAT*. Variation in classroom implementation (fidelity) across treatments was documented. Further analysis related to outcomes is needed.

P1.104

Empowering people to solve our health crisis - the untapped potential of true collaboration, support, and a holistic, positive approach to health!

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

Our competitors (e.g., fast food chains, car industry) are successful at global branding and communication, creating positive images and feelings, and connecting with people. In health promotion, we too often take a deficit approach to health, do not integrate the target group, and are not integrating social marketing and social media. In my research, I tested if and how we could fill this gap.

Methods:

In a constructivist-interpretative paradigm, I used an action research framework to create and implement a social marketing campaign in a Secondary School of 2,700 students.

Results:

Despite the prevalence of unhealthful behaviours and an 'uncool' image of healthy lifestyles among youth, students showed strong concerns regarding the nation's status quo and were passionate about changing it (health image, behaviours, and outcome). They were highly engaged in developing a comprehensive, professional marketing campaign. Thus, the phases of issue construction and action planning were very successful. Yet, during the action phase, students struggled to bring the campaign to life. The reflection phase included regrets and corroborated the exact action plan.

Deeper analysis showed a myriad of reasons for a lack of responsibility. The main challenge was the missing felt support by fellow students, teachers, and school management. Especially the support and collaboration with school management (i.e., policy-makers) are important. Students highlighted the need for policy-changes in all phases and showed their potential of "thinking big". This upward delegation of responsibility brought along a sense of helplessness - in addition to the perceived helplessness of going against societal norms and standards. Yet, I analysed that a key issue were misperceived perceptions - regarding campaign image and support as well as health behaviours.

Conclusions:

I conclude that we need to follow the path of collaborative and participatory approaches. To face our competition, we have to think big and truly collaborate - amongst researchers, with experts, policy-makers, and the target groups. While we work in different areas and have different opinions, we must not focus on those differences. The aim is not to deliver one solution, but to inspire and empower people to take responsibility over their life, health, and happiness.

P1.105

Level of Teacher Implementation Determines Behavior Change: Results from the Walk Across Texas Program as part of the Texas Grow! Eat! Go! Intervention Study.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Obesity is recognized as one of the major public health problems today. It has been shown that high levels of excess body fat in children have been predictive of overweight and obesity in adolescence and adulthood. Adding more frequent and additional moderate to vigorous physical activities during school has been shown to improve student fitness and weight. Developed in 1996, Walk Across Texas (WAT), is an evidence based outcome program with proven results. Participants of this session will be introduced to the WAT program's recent findings as a component of the Texas Grow! Eat! Go! Project (TGEG). This session will highlight the importance that the level of implementation has in behavior change.

Methods: As part of the TGEG Project, the WAT intervention was implemented in 14 low-income schools (n=575) over two school years. The first year of intervention in eight schools began in fall 2012 to spring 2013. The second cohort (six additional schools) began in fall 2013 to spring 2014. The WAT intervention consisted of eight weeks of program implementation in the fall and then an additional eight weeks in the spring. WAT website reports reinforced and supported data obtained by student pre- and post-intervention surveys, teacher surveys/classroom logs, child BMI data, and parent pre- and post-surveys.

Results: Results showed that the WAT Program was effective in changing physical activity behaviors, parental social support, and sedentary lifestyle choices. In addition, results showed that various levels of program implementation by individual teachers determined the size of improvement in various health behaviors. Weight stabilization and positive weight changes were also found in children whose BMI percentile was considered obese or overweight in high implementation schools.

Conclusions: Upon completion of the session, audience members will be able to promote and advocate the WAT program and can facilitate the change from a traditional learning environment to a more active classroom by offering feasible, sustainable, as well as affordable alternatives. This model can assist audience members to formulate ideas, methods, and strategies for the implementation of physical activity programs in schools.

P1.106

Psychosocial and Physical Environmental Correlates Affecting Physical Activity Level of East Malaysian Adolescents

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Research to evaluate the structural factors of individual, social and environmental factors, particularly testing indirect effects in mediation analysis are severely lacking.

Objective: The interrelationships and mediating variables of psychosocial and environmental factors hypothesized affecting adolescent physical activity were assessed in East Malaysian adolescent samples (N=313).

Methods: A validated self-report survey was tested in a sample of 443 adolescents and the physical activity level (PAL) was measured using the Yamax pedometer that was worn over 7 days. The structural equation model using SPSS AMOS 22 was used to test the model fit and mediation effects.

Results: A model with five significant predictors fitted the data well (Root Mean Square Standard Error of Approximation: 0.039, Comparative Fit Index: 0.958, and Goodness Fit Index: 0.924), which accounted for 11% of the variance in adolescents' PAL. Fear of crime and traffic safety (inversely correlated) combined their effects on adolescent's PAL. Fear of crime has an indirect effect on PAL through perceived barriers. Parental restriction and peer support are independent predictors of adolescents PAL.

Conclusion: To increase PAL, the focal point of multilevel interventions should be focusing on the reduction of fear of street crime.

P1.108

Physical activity, alcohol consumption, BMI and smoking status before and after prostate cancer diagnosis in the ProtecT trial: Opportunities for lifestyle modification

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SIG: Yes, Cancer Prevention and Management

Awards: No

Associations between certain lifestyle characteristics and prostate cancer risk have been reported, and continuation of some behaviours post-diagnosis, such as high alcohol intake, low physical activity and smoking, can adversely affect prognosis. We explored whether men make spontaneous changes to their physical activity and alcohol intake, body mass index (BMI) and smoking status, following a diagnosis of localised prostate cancer. A detailed diet, health and lifestyle (DHL) questionnaire was completed by 511 participants within the Prostate Testing for Cancer and Treatment (ProtecT) randomised controlled trial, both before and 9 months after a diagnosis of prostate cancer. Of 177 men who were insufficiently active before their diagnosis (median 0 activity units/week; IQR 0 to 9), 40.7% had increased their activity by a median of 22 units/week (IQR 15 to 35) 9 months later, and there was weak evidence that men were more active after diagnosis than before ($P=0.07$). Men categorised as 'working' occupational social class and who were insufficiently active for health benefits before diagnosis were 1.99 (95% CI = 1.02 to 3.87; $P=0.04$) times more likely to have increased their physical activity levels compared to men classified as 'managerial or professional.' Following diagnosis, there was an overall reduction in alcohol intake ($P=0.03$) and the proportion of current smokers ($P=0.09$), but no overall change in BMI. We conclude that some men spontaneously change certain lifestyle behaviours on receiving a diagnosis of prostate cancer. For many men, however, additional support through lifestyle interventions are probably required to facilitate and maintain these changes.

P1.109

Mediating Effects of Resistance Training Skill Competency on Health-Related Fitness: The ATLAS Cluster Randomised Controlled Trial

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: To examine the mediating effect of resistance training (RT) skill competency on percent body fat, muscular fitness and physical activity among a sample of adolescent boys participating in a school-based obesity prevention intervention.

Methods: Participants were 361 adolescent boys (mean age, 12.7 \pm 0.5 years) taking part in the ATLAS cluster randomized controlled trial. ATLAS was a school-based program targeting the health behaviors of economically disadvantaged adolescent males considered 'at-risk' of obesity. Body fat percentage (bioelectrical impedance), muscular fitness (hand grip dynamometry and push-ups), physical activity (accelerometry), and RT skill competency were assessed at baseline and at 8-month follow-up. Three separate multi-level mediation models were analyzed to investigate the potential mediating effects of RT skill competency on each of the study outcomes using a product-of-coefficients test. Analyses followed the intention-to-treat principle.

Results: The intervention had a significant impact on boys' RT skill competency, and improvements in skill competency significantly mediated the effect of the intervention on percent body fat (B [SE] = -.95 [.26]; 95% CI = -1.49 to -.47) and the combined muscular fitness score (B [SE] = .16 [.07]; 95%CI = .03 to .31). No significant mediated effects were found for physical activity.

Conclusion: Improving RT skill competency may be an effective strategy for achieving improvements in body composition and muscular fitness in adolescent boys. Consequently, movement skill development should be a core component of obesity prevention and fitness programs targeting this group.

P1.110

Camden Active Spaces: Does the construction of active school playgrounds influence children's physical activity levels?

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

The school environment is a promising setting to increase children's physical activity but limited empirical evidence exists on how a change in the outdoor physical school environment influences physical activity behaviour. The London Borough of Camden is redesigning seven existing school playgrounds to engage children to become more physically active. The primary aim of this project is to evaluate the impact of the redesigned playgrounds on children's physical activity, well-being and physical function/fitness. We present here the study design and baseline sample.

Methods:

This project will use a longitudinal quasi-experimental design. Seven experimental schools and two control schools have been recruited at baseline. Two follow-up assessments will be carried out after construction of the new playgrounds. At baseline, a series of fitness tests, anthropometric and questionnaire measurements and 7-day objective physical activity monitoring (Actigraph accelerometer) were carried out on the children (aged 5–16 years). This will be repeated at follow-up. Changes in overall physical activity levels and levels during different times of the day (eg, school breaks) will be examined. Multilevel regression modelling will be used to analyse the data.

Results/findings:

The baseline sample comprised 450 students from the nine schools. Students had a mean age of 9 years, 51% were boys and 36% Caucasian. Boys spent on average 35 minutes a day in moderate-to-vigorous physical activity (MVPA) and girls just 22 minutes. Boys spent on average 338 minutes a day in sedentary activities and girls 369 minutes.

Conclusions:

Physical activity levels of children residing in Camden are low. We hypothesise that the new playgrounds will increase young people's time spent in light physical activity and MVPA and reduce sedentary behaviour during break time, and consequently improve levels of general fitness.

P1.111

Understanding for whom, under what conditions, and how group-based physical activity interventions are successful: A realist review.

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Participation in group-based physical activity (GBPA) interventions has been found to result in higher levels of exercise adherence and program compliance. However, previous reviews of GBPA programs have provided limited insight regarding 'for whom', 'under what conditions', and 'how' these interventions increase physical activity behavior.

Methods: The systematic search paired group dynamics-based terms (e.g., group goal setting, cohesion, interaction) with physical activity, exercise, fitness, and adherence in PubMed, PsychInfo, and Web of Science search engines. Articles underwent title, abstract, and full-text elimination to determine eligibility (i.e., those with participants > 18 years of age, 'true' groups, at least two assessments of targeted outcome). Two authors used a predetermined coding sheet to independently code articles and resolved discrepancies by referring back to the text.

Results/findings: The search criteria resulted in 32,674 unique and potentially eligible articles. Articles were excluded through title (n = 31,455), abstract (n = 1,094), and full text (n = 70) review processes. Fifty-six articles, representing 52 unique GBPA interventions, were included in the final realist review. Of those, 92% (n = 48) reported significant increases in participant physical activity levels regardless of study design, target population, theoretical basis, or intervention context. Overall, the review resulted in three main findings and related recommendations. First, GBPA have worked for a variety of populations worldwide. However, more research is needed on the boundary conditions (i.e., moderating factors) for whom GBPA work. Second, interventions have varied in the duration, frequency, and number of group-based strategies used, and randomized comparative trials may be necessary to isolate the mechanisms of effect. Third, these interventions have been conducted in a diverse range of settings, using a variety of research designs and analytical approaches. Less information is known about the costs or sustainability of these programs as well as the feasibility of the interventions in particular settings.

Conclusions: The results of this realist review support a group-based approach to physical activity promotion. Further, this review has important implications for practice, refining trial designs, and replication across diverse populations and settings.

P1.112

Factors Influencing Knowledge of Physical Activity Recommendations in UK Working Adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

The health benefits of being physically active have been well established yet a high proportion of adults in England do not do enough physical activity to benefit their health. Knowledge of physical activity guidelines has been theoretically supported as a pre-requisite to individual's positive motivation to engage in more physical activity. The aim of this study was to investigate predictors of knowledge of physical activity guidelines within working UK adults.

Methods:

Data was collected through the *CSPN Workplace Challenge* launched as part of the 'Get Healthy Get into Sport' initiative funded by Sport England. 11,035 UK adults from various workplaces across the UK engaged with an online survey. The survey asked; 'what are the national recommendations for taking part in physical activity, in terms of minutes per week of moderate intensity physical activity?' in addition to questions on demographics, physical activity, barriers to physical activity and promotion of physical activity and health. A total of 10,953 adults were included in the analysis. The sample was 37% male, 95% White, 63% with a degree or higher, 81% in good or excellent health and had a mean age of 38.9 ±11. Multiple logistic regression analyses identified contributing factors towards the prediction of accurate knowledge.

Results:

The physical activity guideline was accurately reported by 15% of adults. Accurate knowledge of physical activity guidelines was predicted by lower age (OR=.99, $p<.005$), self-reporting excellent/good health (OR=1.63, $p<.001$), female gender (OR=1.26, $p<.001$), being educated to degree level or above (OR=2.71, $p<.001$), engaging in recommended levels of physical activity (OR=1.41, $p<.001$), having an employer who promotes physical activity/sport (OR=1.46, $p<.001$) and holding responsibility to promote workplace health (OR=3.24, $p<.001$). Accurate knowledge was less likely within the Asian ethnic group (OR=.43, $p<.005$) and within individuals reporting not being active enough as a barrier to physical activity (OR=1.41, $p<.05$).

Conclusions:

Knowledge of physical activity guidelines was low and demographic imbalances in knowledge emerged within a highly educated and employed sample. Adults who do not know guidelines may overestimate the recommended duration which could be motivationally damaging. Employers could be targeted as an important social influence.

P1.113

Do Benefits And Barriers Differ By Time And Stage of Adoption For Physical Activity Among Iranian Girls

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: No research has examined longitudinal changes in beliefs by stage of physical activity adoption in Iranian females and such research is necessary so that effective interventions and promotion efforts can be created. In particular, Iranian girls face many barriers to be active and this research highlights specific psychosocial correlates that can be targeted in future research and promotion efforts. This study reports on a novel longitudinal study physical activity in terms of differences in individual perceived benefit and barrier items by stage of adoption of physical activity during a three-year transition from junior high school to high school.

Methods: Data were collected from female adolescents in 2009 (n=558), of whom 412 provided follow up data in 2012. Logistic regression analysis was conducted to compare the stages with pre-contemplation stage as the reference group. Responses to specific benefits and barriers items were dichotomized into agree or disagree, and then the five stages of adoption compared how much females agreed or disagreed with specific items over time.

Results: Participants in the action and maintenance stages reported the greatest agreement with benefits. There were main changes for the items "have more energy" and "have fun" in terms of odds of being in stages of PA adoption from baseline to follow up. Pre-contemplators were about four times more likely to cite "not enough time" than preparers (OR= 3.95). Pre-contemplators were over four times more likely to cite not liking exercise than those in action and maintenance stages at baseline (OR= 4.32 and 4.85), which was also found at follow-up (OR= 3.66 and 8.65).

Conclusion: These findings could help with the creation of interventions tailored to encourage pre-contemplators to progress toward adoption of physical activity. In addition, exploring interests, putting the fun back into exercise, and avoiding competitive games, could contribute to progression from pre-contemplation adoption to adoption stages. The transportation supports, time management, and mitigating boredom may be helpful strategies either to prevent relapse in adoption stages or to move females in early stages toward advanced ones.

P1.114

Pocket Pedometer vs. Smartphone-based Pedometer to Promote Physical Activity in the Community: Experience from Qatar

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Studies have shown that at least 10,000 steps per day are required to help prevent chronic disease and improve quality of life. In community programs pocket pedometers have gained popularity as an acceptable method to monitor step count. However, smartphone-based pedometer applications may offer a simpler and more cost-effective solution to monitor physical activity.

Objective: To compare the acceptability and compliance to achieve recommended physical activity targets when using a smartphone-based pedometer and a pocket-based pedometer.

Methods: In a community program designed to improve physical activity, 1,742 pocket Omron pedometers were distributed freely from 1 Dec 2013 to 31 Jan 2014. An additional 962 participants elected to use the smartphone-based pedometer application. In this cohort study (where participants were matched for age, gender and ethnicity) a randomly stratified sample of 400 participants were followed up for six months. The number of days participants used the devices (and the associated web platform to upload data), and the number of participants that reached the target of 10,000 steps per day was quantified.

Results: The average age of participants in this study was 35.4±11.7 years. Pocket pedometer users utilized the device and associated web-based platform for a longer duration (mean = 117 days, 95% CI = 97-136 days) when compared to smartphone users (mean = 82 days, 95% CI = 63-102 days) ($P=0.015$). Moreover, smartphone pedometer users reported less steps per day (2,116±198) when compared pocket pedometer users (5,888±184) ($P<0.001$). Further, smartphone pedometer users achieved the target of 10,000 steps per day for 1.8% of the time when compared to 15.6% of pocket pedometer users. Level of physical activity (average steps/day and % achieving target) was poor among females irrespective of the device used ($P<0.001$).

Conclusion: Pocket pedometers were used for a longer duration in the community program. Although smartphone pedometers offer a more cost effective alternative for monitoring physical activity, there is a need to introduce further enhancements to improve acceptability and compliance for their use within community based programs.

P1.115

Camp PALS: A Summer Camp Promoting Physical Activity in Children and Adolescents with Social Skills Deficits

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Children and adolescents with Autism Spectrum Disorder (ASD) and Attention Hyperactivity Disorder (ADHD) have been reported to be less physically active than typically developing peers. Social deficits often hinder motivation and enjoyment of physical activity (PA) in these populations. The purpose of this study was to describe the levels of PA of children and adolescents with ASD and ADHD during a summer camp specifically designed to foster PA and life skills for those with social deficits.

Methods: Twenty-two children and adolescents (6-17 years; mean = 11.2 ±0.62 years) with ASD (n=14) and ADHD (n=8) attending a bi-weekly, half-day (9:00am-1:30pm) summer camp wore an ActiGraph GT3X accelerometer during the camp day. Accelerometers were worn on the campers' waist over the right hip for the duration of the camp day, and campers' wear times were recorded. Data were collected in 15s epochs and Evenson cutpoints were applied to categorize PA into intensity levels. Descriptive statistics were used to determine average daily time spent in total physical activity (TPA) and moderate-to-vigorous physical activity (MVPA).

Results: Average accelerometer wear time for all campers was 247.6 min (±17.19) per camp day. Campers accumulated 117.1 min/day (±30.86) of TPA, of which 25.6 min/day (±14.14) were MVPA. Boys spent 26.4 min/day (±16.17) in MVPA and 124.1 min/day (±32.60) in TPA, and girls spent 24.1 min/day (±1.48) in MVPA and 108.4 min/day (±32.57) in TPA. Boys spent significantly more time in TPA compared to girls ($p=0.0043$). Campers with ASD spent 25.6 min/day (±15.86) in MVPA and 119.7 min/day (±27.78) in TPA, and campers with ADHD spent 25.7 min/day (±11.63) in MVPA and 113.7 min/day (±34.59) in TPA. There were no significant differences between diagnoses.

Conclusions: During a summer camp designed to promote PA and social skills, campers with ASD and ADHD accumulated nearly half of the daily recommended minutes of MVPA (60min MVPA/day) and spent nearly 50% of the camp day engaged in PA. The provision of summer camps which consider the unique characteristics of those with social deficits may help facilitate participation in PA in an enjoyable, supportive environment.

P1.116

“Pre-schoolers in the Playground” - a pilot cluster randomised controlled trial of a physical activity intervention for children aged 18 months to 4 years old.

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Children living in deprived urban areas and those from ethnic minority groups are at greater risk of being less active. Time spent outdoors is associated with higher levels of physical activity (PA) and lower risk of being overweight in pre-school children. Levels of PA track through childhood into adulthood, thus establishing PA early in life is vital. This study aimed to undertake a pilot cluster randomised controlled trial (RCT) of an outdoor playground-based physical activity intervention (“Pre-schoolers in the Playground”; PiP) and to assess the feasibility of conducting a full scale cluster RCT. The intervention was targeted at parents and pre-school children living in Bradford, UK, a city with high levels of deprivation and a multi-ethnic population.

Methods: A database captured recruitment and retention rates of schools and families. Following baseline measures schools were randomly allocated on a one-to-one basis to receive the PiP intervention or to continue usual routines. At baseline, 10 and 52 week follow-up children’s PA (Actigraph accelerometers), height, weight, waist and upper arm circumference, child and parent Health Related Quality of Life, and health and social care service use were measured. Interviews and intervention attendance data assessed intervention feasibility. Scored observations assessed intervention fidelity. Retention, outcome measure completion rates and interviews assessed trial feasibility.

Results: Thirty-seven percent of schools and 48% of parents approached agreed to participate. Ten schools and 164 children (2.8±0.7 years) were recruited. Retention was good at 10 and 52 weeks (82.3% and 83.5% respectively). Trial procedures were acceptable. Families and schools reported the intervention and trial to be acceptable. However, attendance was low during the autumn and winter/spring Initiation phases but somewhat better in the summer term Initiation phase. Attendance was poor throughout all Maintenance phases. The accelerometry protocol requires modification to improve wearing compliance. Fidelity of intervention implementation was good (81% adherence). The intervention was borderline cost-effective. A sample size of 600 children from 38 schools would be required for a full trial.

Conclusions: It is feasible to conduct a full RCT of the PiP intervention. The PiP intervention requires some modification to improve intervention attendance e.g. a summer-term only intervention, but was found to be acceptable to both schools and families.

P1.117

Academic performance in the process for college admission is associated with time allocation for scheduled physical activity at age 14

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Background and Objective: Adolescence is a period in which physical activity (PA) shows the greatest decline across the lifespan and at the same time a critical transitional stage for cognition. PA during adolescence may be key not merely for physical health enhancement but to improve cognitive skills and learning abilities. We aimed to study the association between scheduled physical activity (SPA) at age 14 and academic performance in the process for college admission in youths from Santiago (Chile).

Method: Longitudinal population-based study. In a random sample of 450 youths (17.8±0.5 years), we measured scheduled physical activity (SPA), accounting for Physical Education and extracurricular sports, and academic performance using the compulsory tests for college admission (Language and Mathematics) and the grade point average (GPA) over high school. Tests scores and GPA ≥75th percentile in our sample were considered to be advanced academic performance. Binomial logistic regressions tested the relation between advanced performance (outcome) and weekly time allocation for SPA (exposure), after adjusting for sex, socioeconomic background and type of school.

Results: At age 14, 69% of students devoted < 2 h/week to SPA, whereas 13% devoted 2-4 h/week. A reduced time allocation for SPA significantly lowered the odds of advanced performance in both the Language and Mathematics tests and the GPA. Students devoting <2 h/week to SPA were 77% (CI 95%: 0.13-0.43; P<0.001), 86% (95% CI: 0.07-0.29; P<0.001) and 57% (95% CI: 0.24-0.79; P<0.001) less likely to be advanced performers in Language, Mathematics and the GPA, respectively.

Conclusion: In our sample, a higher time allocation to SPA was associated with better performance in the process for college admission. These results support the idea that active lifestyles are consistent with good academic outcomes and, similarly, suggest that the effect of repetitive and planned exercise on academic performance could be long-term. The challenge to promote active living among youth may require to think beyond health itself and put the accent on benefits that provide much stronger incentives, like the possibility of getting good academic results and, eventually, better professional prospects.

Funding: FONDECYT n° 1100431 and PAI n° 79140003.

P1.118

When the rules change: Implications for student's motivation in Physical Education classes

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SIG: Yes, Policies and environments

Awards: No

Purpose:

In Portugal, grades are the key factor to access the best universities. An average of all curricular grades obtained within the Secondary School years, including from Physical Education (PE), used to be calculated until recently. In 2012/2013, a government decision was made to remove PE grades from this equation. This legislative change might have affected the quality of students' motivation toward PE classes. This study explored this issue by comparing students on the last secondary school year (i.e., PE grade still included in the equation - designated as GRADE) with students on the first two secondary school years (i.e., PE grade excluded from the equation - NOGRADE) on several PE-related motivational variables.

Methods:

This cross-sectional study comprised 721 students (383 girls; 16.92±1.33 years; 283 GRADE), from secondary schools located in Lisbon, Portugal. Student volunteers completed self-report measures assessing PE motivational regulations, basic psychological needs' satisfaction and frustration, and engagement in PE classes. ANCOVAs compared the two groups of students, controlling for gender.

Results:

As expected, GRADE students showed higher scores on engagement (all $p < .001$, large effect sizes), autonomous motivation and introjected regulation (all $p < .01$, medium effect sizes) and need satisfaction (all $p < .01$, medium and large effect sizes). NOGRADE students showed higher scores of amotivation ($p < .001$, large effect size) and need frustration (all $p < .01$, medium effect sizes). No differences were found for the external regulation.

Conclusion:

This study suggests that changing the rules negatively affected student's quality of motivation toward PE. Given that the PE curriculum focuses on the development of knowledge, skills and aptitudes for an active lifestyle, and that physical inactivity is a serious mortality risk factor, this decision could lead to a long-term increase of non-communicable diseases in Portugal.

P1.119

Engaging inactive employees in sport and physical activity through the workplace

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: A high proportion of adults in England do not participate in sufficient sport and physical activity to benefit their health. The workplace is an ideal setting to promote physical activity to adults due to the amount of time people spend at work. However, to date, few workplace physical activity programmes and interventions have specifically targeted the inactive, or attempted to understand the role the workplace can play in promoting and increasing physical activity and sports participation in this hard to reach group. The aim of this paper is to explore factors that enhance the engagement and retention of inactive employees in physical activity opportunities in the workplace.

Methods: Data were collected through the CSPN Workplace Challenge project. Inactive employees were identified from their responses to the Single Item Measure of Physical Activity (PA SIM) on the registration survey (those answering 0 or 1 days) and recruited to take part in a semi-structured interview which explored factors influencing participation and approaches to engaging employees in workplace physical activity. Data were transcribed and analysed using a thematic approach based on the principles of grounded theory.

Results: Interviews were conducted with 21 inactive employees from 18 organisations of varying sizes across England. All interviewees stated that being active was important and held positive views about its benefits; however this was insufficient in motivating them to be more active. Factors influencing physical activity participation included: time constraints, low self-efficacy to participate in the workplace, city based offices, shift working, lack of management support and lack of a supportive organisational culture for physical activity. Several approaches were suggested that could contribute to the engagement and retention of the inactive including: increasing management support, social participation, signposting to suitable activities, making physical activity opportunities varied and providing targeted information.

Conclusion: Developing a workplace culture that supports employees to be more active is vital in encouraging behaviour change in inactive employees. Findings suggest a focus on developing employee confidence, adopting a flexible and adaptable approach and promoting the recommended physical activity guidelines are factors to consider in the design and implementation of workplace physical activity programmes to enhance participation.

P1.120

A systematic review of adoption, implementation and impact of daily physical activity policies in Canadian schools

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Few children meet physical activity (PA) recommendations, and are therefore at increased risk for overweight/obesity and adverse health outcomes. Schools require students to engage in some amount of PA through physical education courses, however these courses alone do not provide children with sufficient PA opportunities. Several Canadian provinces have therefore adopted school-based daily PA (DPA) policies that stipulate minimum PA time requirements for children during, and in some cases outside of, school hours. The purpose of this study was to synthesize evidence regarding adoption, implementation and impact of Canadian school-based DPA policies.

Methods: Electronic databases, reference lists and websites of relevant research centers/organizations were searched to identify studies that had investigated adoption, implementation or impact of Canadian DPA policies. Articles were eligible for inclusion if they met the following criteria: 1) Original research study published in a peer-reviewed journal in English or French; and 2) Evaluated adoption, implementation or impact of school-based DPA policies in Canada. Of the 917 articles identified, 29 remained following title/abstract review and were reviewed in full by 2 independent reviewers. Thirteen articles (9 unique studies) met all inclusion criteria and were included in the final review.

Results/findings: One study assessed adoption of DPA policies. Eight papers (6 studies) evaluated DPA policy implementation, including adherence to policies, implementation models, processes and perspectives of implementation, primarily using self-report methods. Their collective results suggest moderate, but inconsistent implementation of DPA policies. Policy impact was assessed in 9 papers (5 studies). Three papers used accelerometry, while the remainder relied on self-reported surveys to assess delivery of physical education, PA behaviors, and BMI. The available data suggest that Canadian DPA policies have had little to no impact on school-aged children's PA levels or BMI. Overall findings are tentative in light of variability in methods used, outcomes considered, and the small number of studies.

Conclusions: Current evidence suggests moderate implementation but little impact of Canadian DPA policies on children's PA levels and BMI. By reviewing evidence regarding implementation and impact of DPA policies, this study can inform useful amendments to existing policies, and help to strengthen provisions within future legislation.

P1.121

The Physical Education Predisposition Scale: preliminary tests of reliability and validity in a sample of Australian students.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Welk (1999) developed the Youth Physical Activity Promotion Model (YPAPM), in which decisions about physical activity behaviour are reduced to two fundamental questions (1) *is it worth it?* and (2) *am I able?* These variables are modifiable within school HPE lessons, which have been identified as influential contexts. The Physical Education Predisposition Scale (PEPS, Hilland et al., 2009) was developed and tested in England; therefore the purpose of this study is to psychometrically test the PEPS with a sample of Australian secondary school students. Furthermore, the study aims to explore how the students' cost/benefit assessment factors and self-perceptions are related, whilst also investigating age and sex differences.

Methods: The questionnaire comprised of the original 22 items modified from previously validated measures, and was administered to 164 children in years 7–10 (aged 12–16 years) from four Melbourne schools located within the South Eastern Victorian government schools region. EFA with direct oblimin rotation will be employed and alpha will be employed to assess inter-item reliability. To confirm the factor structure obtained from the EFA, a CFA using SEM techniques will be conducted. Test–retest reliability will be assessed using the method recommended by Nevill et al., (2001). Pearson's product–moment coefficients will be used to assess the correlation between the resultant factors, and a 2x2 ANOVA to explore differences in response to the between age and sex groups.

Results: Direct oblimin rotation will reveal the factor solution (PE Worth & PE Ability) explaining the percentage of variance. Levels of internal consistency and sex and age differences for both PE Worth and PE Ability will be reported, as well as the correlation between the factors.

Conclusions: The results will hopefully support the cross-cultural transferability of the PEPS as a short measurement tool for use in the PE setting. The PEPS can then be used in practice to identify students' perceived PE Worth and Ability scores. PE teachers could then adapt or amend their pedagogical strategies to enhance students' perceived PE Worth and Ability and this may enhance the ability of PE to influence students' health-enhancing physical activity choices.

P1.122

Neighborhood walkability, fear and risk of falling and response to walking promotion: The Easy Steps to Health 12-month randomized controlled trial

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SIG: Yes, Policies and environments

Awards: No

Purpose: The relationships between perceived neighborhood walkability, fear and risk of falling and older adults walking behaviour are poorly understood. This study aimed to determine whether: 1) fear of falling and falls history were associated with perceptions of walkability 2) which walkability attributes predicted or moderated change in exercise walking.

Methods: The study used data from community-dwelling inactive (physical activity <120 mins/wk) adults ≥65 years who participated in a 12-month randomized controlled trial on walking and falls and completed baseline and 12-month interviews (n=315). The outcome was a validated question (Spearman rho=0.35) on planned walking (PW, defined as walking ≥150 mins/wk at 12 months). Exposures were: 11 items from the neighbourhood walkability scale (NEWS-AU), falls efficacy scale, falls history, mobility status, self-efficacy for brisk walking, perceived health and socio-demographics measured at baseline. Logistic regressions were performed to identify significant predictors and moderators of PW at follow-up.

Results: Participants perceived their surroundings as relatively less walkable (lowest quartile <34 points) if they had poorer mobility and poor health had fall injury and were recurrent fallers (≥2 falls). Participants with a higher concern about falling while doing indoor or outdoor daily activities tended to have poorer perception of "close-by" destinations. At 12 months Cohen D effect size was 0.52. Adjusting for individuals' determinants, PW at follow-up was significantly higher in "less greenery" (AOR=3.3, 95% CI: 1.11- 9. 98) and in "high traffic" (AOR=1.98, 95% CI: 1.00-3.91) neighborhoods, and lower if crime rate was considered to be a problem (AOR=0.31, 95% CI: 0.09-1.09). The intervention had a greater effect in participants who perceived local walking infrastructure (e.g., existence of sidewalks, crosswalks, pedestrian crossing and signals) to be poorer (p for interaction =0.036) but was not significantly higher than control when infrastructure is good.

Conclusion: Perceived walkability can be shaped by falls risks and need to be considered in the research on older adults' perceived environment and physical activity. Safety, as expected, and traffic and greenery, in unexpected direction, predicted walking at 12 months in a context of intervention. The intervention had a greater impact in environments reported to have unsupportive walking infrastructure.

P1.123

Health benefits of different sport disciplines for adults: systematic review of observational and intervention studies with meta-analysis

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Health impacts of physical activity are extensively documented but less is known about the health benefits of sports. The aim was to assess the quality and strength of the evidence for the health benefits of specific sport disciplines.

Methods:

Electronic search of six databases yielded 2194 records. Selection against inclusion/exclusion criteria resulted in 69 eligible studies with 47 cross-sectional, nine cohort and 13 intervention designs. After data extraction and synthesis the quality of the studies and the strength of the evidence were assessed. Six football interventions provided sufficient data for meta-analyses.

Findings:

105 comparisons between participation and non-participation groups in 26 different sport disciplines were reported. Most comparisons comprised running, football, gymnastics, cycling, and swimming. The quality of eight cohort studies was rated high or moderate and that of all intervention studies moderate or weak. Intervention and cohort studies showed moderately strong evidence that both running and football improve aerobic fitness and cardiovascular function at rest, and football reduces adiposity. The effects of football were confirmed and quantified by meta-analysis. Conditional evidence showed that running benefits metabolic fitness, adiposity and postural balance, and football improves metabolic fitness, muscular performance and postural balance, and results in positive cardiac adaptations. Most of these benefits apply to both adult women and men. Evidence for health benefits of swimming, recreational cycling and other sport disciplines was either inconclusive or tenuous.

Conclusions:

This review demonstrates that the evidence base for the health benefits of specific sports disciplines is generally compromised by weak study design and quality. The exception is for running and football which provide the strongest evidence for positive health benefits. Future research should address the health effects of different sport disciplines using rigorous research designs.

P1.124

The influence of pedometer reactivity on physical activity behaviour and social cognitive variables.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: There is evidence that a pedometer reactivity effect may exist in short term physical activity (PA) surveillance studies. It is speculated that the immediate feedback provided by pedometers may influence participants' PA levels (i.e. step counts) through changes in their social cognitions (i.e. increased self-efficacy/goal setting). However, little research has actually examined if this is the case. The purpose of the current study was to investigate whether any changes in PA (as a result of pedometer reactivity) was accompanied by changes in participants' social cognitions.

Methods: A community sample of 94 participants were recruited (30 males, 64 females, mean age = 41.7 years). Participants were given pedometers to record their daily steps over a 2-week period and were instructed not to change their daily routine in any way. PA was measured using pedometers (Yamax, SW-701), daily log books, and questionnaires (IPAQ). Social cognitive factors (including self-efficacy, goal setting, social support, enjoyment, and perceived barriers) were measured using standardised questionnaires at baseline, week 1, and week 2.

Results: A series of one way repeated-measures ANOVAs were used to investigate changes in physical activity and social cognitive factors over time. The analysis revealed significant increases in self-reported walking across the 2-weeks, $F(1.87, 162.9) = 2.94$, $p = 0.024$. Conversely, this was accompanied by significant decreases in social support from family, $F(2, 86) = 3.19$, $p = 0.0465$, and levels of enjoyment, $F(1.74, 151.51) = 3.19$, $p = 0.018$. Furthermore, there were no significant changes in pedometer steps, $F(1, 93) = 1.67$, $p = 0.2$, self-efficacy, $F(1.76, 153.35) = 4.42$, $p = 0.81$, goal setting, $F(1.58, 135.67) = 0.72$, $p = 0.46$, or perceived barriers, $F(1.83, 159.03) = 1.13$, $p = 0.32$, across the study.

Conclusions: These findings suggest that pedometer wear may increase participants' perceptions of walking in the short term. However, this may not be associated with changes in their social cognitions (i.e. self-efficacy/goal-setting) as previously speculated. Conversely, enjoyment and social support decreased, suggesting that feedback from pedometers may instead raise individuals' awareness of the difficulties in maintaining adequate levels of PA.

P1.125

Gender-related psychological and behavioral correlates of sports participation among university freshmen in Taiwan

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Objective:

Physical activity has been widely advocated for in healthcare practice owing to its benefits in physical as well as psychological health. However, little is known about the association between sports participation and psychobehavioral outcomes in young adults. We aimed to delineate the psychological and behavioral correlates of youth sports participation in Taiwan.

Methods:

This is a cross-sectional study of new university enrollees in a single medical center. Fasting serum was collected for metabolic surveys. Metabolic risks were defined by the presence of waist circumference > 90 cm in men and > 85 cm in women, fasting glucose > 100 mg/dL, blood pressure > 130/85 mmHg, triacylglyceride > 150mg/dL, and high-density lipoprotein < 40 mg/dL in men and < 50 mg/dL in women. Lifestyle parameters, perceived health status, quality of life, depression scale, social support scale and health-compromising behaviors were assessed using self-report questionnaire designed specifically for this study. Student t test and Chi-square test were appropriately used to compare differences between genders. Further, we delineate the association between psychological and behavioral outcomes and sports participation using multivariate regression analysis in a stratified sample by gender.

Results:

A total of 2515 new university enrollees with a male predominance (61.7%) were recruited from a single medical center. Gender difference was noted in rates of overweight/obesity, regular breakfast, exercise habits, perceived body image, cigarette smoking, alcohol drinking, delinquency, and dissatisfaction with body image. Interestingly, male group with higher overweight/obesity rate than female group but has better perceived body image while female group feel fatness body image. Among male group, subjects with exercise > 5 times/week revealed better perceived health status, better subjective quality of life, lower depression score, less alcohol drinking, and more dissatisfaction with body image. Among female group, subjects with exercise > 5 times/week represented only less alcohol drinking.

Conclusion:

Gender differentiation is noted in the correlation between sports participation and psychobehavioral outcomes. Sports participation is not only related to positive psychological adaptation but also confers reduction in alcohol drinking among male university freshmen. Participants with high sports participations are at high risks for dissatisfying body image in both genders.

P1.126

High school students' situational interest predicting physical activity levels in exergaming

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: It has been evident that students' motivation is the key in increasing physical activity (PA) levels during exergame play (Staiano & Calvert, 2011). Recently, situational interest (including five dimensional sources) has been used to investigate students' motivation when playing exergames (Huang & Gao, 2012). It was reported enjoyment and novelty predicted young children's moderate-to-vigorous PA (MVPA). However, no study is available to investigate the relations between situation interest and PA among high school students. Therefore, the purpose of this study was to examine the predictive utility of high school students' situational interest components and PA during exergame play.

Methods: A total of 60 ten through twelve grade students (32 girls; M = 16.17 years, SD = 1.17) participated in one 30-minute session Reflex Ridge game of Xbox 360 Kinect Adventures. Students' PA levels were measured by ActiGraph accelerometers with percentages of time spent in sedentary, light PA and moderate-to-vigorous PA (MVPA) as the outcome variables. They also responded to the validated Situational Interest Scale (including novelty, challenge, attention demand, exploration intention, and instant enjoyment) at the end of the session.

Results: All components of situational interest were positively related to one another ($p < 0.05$) except the relations between challenge and enjoyment ($p = 0.66$). Hierarchical regression analysis revealed that attention demand emerged as the only positive predictor for students' MVPA ($\beta = 0.33$, $p < 0.06$, explaining 5.3% of the variance. For light PA, attention demand was a negative predictor ($\beta = -0.50$, $p < 0.01$) accounting for 8% of the variance while novelty was a positive predictor ($\beta = 0.26$, $p < 0.05$). All components explained approximately 19% of the variance. However, there was no significant predictor for students' sedentary.

Conclusions: The findings indicate complex relations among situational interest components. Interestingly, the novelty component of the exergame is not enough to engage high school students in levels of PA congruent with health benefits. It is recommended educators focus the attention demand feature of exergames to promote high school students' PA.

P1.127

Walking to work in adults employed in England: associations with individual characteristics, work-related characteristics and perceived barriers

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Only 9% of adults in England walk to work. Promoting walking to work is one potential strategy for increasing physical activity levels however the factors influencing this behaviour are not fully understood. This paper explores individual and work-related characteristics associated with walking to work and perceived barriers.

Methods: Data were collected in the 'Walking Works' baseline survey (response rate=28%, n=1544). Respondents reported demographic and work-related characteristics and indicated their main barriers to walking to work. Respondents with data for total number of minutes spent walking to/from work in the past week (n=1189) were classified into 'non-commuter walkers' or 'commuter walkers' and included in the analysis. Associations of individual and work-related characteristics with commuter walking, and differences in perceived barriers between non-commuter and commuter walkers, were assessed using logistic regression analysis.

Results: Respondents were female (65.6%) and aged 37.2 \pm 11.2 years. Almost half (49%, n=587) were classified as commuter walkers. Being a commuter walker was significantly more likely amongst employees who were <30 years old (odds ratio (OR) 1.98, 95% confidence interval (CI) 1.45-2.71), did not own a car (OR 9.76, 95% CI 6.07-15.71), lived <2 miles from work (OR 5.32, 95% CI 3.85-7.39), had no free car parking at work (OR 3.73, 95% CI 2.89-4.81) or were employed in administrative/clerical roles (OR 1.80, 95% CI 1.30-2.51) and significantly less likely amongst employees who were of white ethnic origin (OR 0.44, 95% CI 0.25-0.80), had children under 16 (OR 0.71, 95% CI 0.55-0.92) or worked regular hours (OR 0.46, 95% CI 0.31-0.69). Barriers frequently cited by non-commuter walkers included: living too far from work (70.7%), more convenient to use a car (51.9%), takes too long (50.7%), don't have time (43.7%) and need a car to do my job (34.7%). There were significant differences between the proportion of commuter and non-commuter walkers reporting these barriers.

Conclusion: A range of individual and work-related characteristics were associated with commuter walking and a number of barriers frequently reported. Together these findings help us to further understand the factors influencing commuter walking and will aid the development of future interventions.

P1.128

Correlates of combined exercise in gynecologic cancer survivors

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Student Competition

Objective: Despite evidence of the physical and psychological benefits of exercise in cancer survivors, exercise participation rates are low, especially for meeting both the aerobic and strength exercise guidelines. Previous research has examined the correlates of aerobic and strength exercise separately, however, to our knowledge no study has examined the correlates of meeting the combined exercise guidelines in cancer survivors. The purpose of this study was to examine the correlates of meeting the aerobic, strength and combined (aerobic and strength) exercise guidelines in gynecologic cancer survivors (GCS).

Methods: 621 GCS completed a questionnaire that assessed demographic, medical, and behavioral variables and exercise participation. Chi-square tests were used to analyze the association between categorical demographic, medical, and behavioral variables, and meeting the aerobic, strength and combined exercise guidelines. All variables that were significant or borderline significant were entered into a multivariate logistic regression model to predict the probability of meeting the aerobic, strength, and combined exercise guidelines.

Results: Of the 621 GCS 32.9% were meeting the aerobic exercise guidelines, 19.0% were meeting the strength guidelines, and only 11.1% were meeting the combined exercise guidelines. In multivariate analysis, participants were more likely to meet the aerobic exercise guidelines if they were younger (OR=1.83 [95%CI: 1.17 to 2.86], p=0.008), a drinker (OR= 2.17 [95%CI: 1.43 to 3.28], p<0.001), healthy weight (OR=1.74 [95%CI=1.25 to 2.64], p=0.002), and in better health (OR1.74 [95%CI: 1.33 to 2.29], p=<0.001). GCS were more likely to meet the strength exercise guidelines if they were a drinker (OR=1.86 [95%CI: 1.14 to 3.01], p =0.012) and healthy weight (OR=1.72 [95%CI: 1.13 to 2.62], p=0.011). Lastly, GCS were significantly more likely to meet the combined exercise guidelines if they were a drinker (OR=1.94 [95%CI: 1.02 to 3.68], p=0.041) and in better health (OR=1.75 [95%CI: 1.02 to 3.00], p=0.041).

Conclusions: Results suggest that we have a better understanding of the correlates of aerobic exercise compared to strength or combined exercise. Moreover, the data also suggest that the correlates of aerobic, strength, and combined exercise may be different in GCS. The consistent link between alcohol consumption and exercise participation in GCS requires further study.

P1.129

The implication of census unit size and scale for the relationship between land-use mix and active transportation.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

This study seeks to examine the influence of the size of census units on the relationship between land-use mix(LUM) and taking active transport to work. It distinguishes itself from previous research by correcting for the size of census units using units of several geographical scales: the census block, block group and tract. Furthermore, rather than including solely residential land-use mix as a predictor of active transportation; the analysis was extended to include measures of workplace LUM. This research aims to address the following research questions: 1) Does the area of census units influence the relationship between LUM and active transportation? 2) Does the scale of census units influence the relationship between LUM and active transportation? 3) Are both residential and workplace LUM associated with active transportation?

Methods:

Our cross-sectional analyses used the 2010-11 Massachusetts travel survey (n=37,023). We included adults aged 18-65 that work exterior to their residences, in our analyses, giving a final sample size of 15877. The independent variable LUM was measured using the 2005 land-use file from the Office of Geographic Information of Massachusetts. Original and area corrected LUM was measured for the residence and the workplace at three different scales of analysis: the census block, bloc group, and tract. Multilevel binary logistic regression models were used to model the probability of taking an active mode of transportation to work using separate models for all 12 LUM variables.

Results/findings:

Correcting for area strengthened the relationship between LUM and active transport at all scales of analysis. The relationship also strengthened as the scale of the census unit increased (was weakest at the block level and strongest at the tract level). Residential land-use mix was found to be a stronger predictor of active transport than workplace land-use mix.

Conclusions:

The results illustrate the dependency of the LUM active transport relationship on the size and scale of the unit of analysis. Therefore, we urge researchers to correct for geographical size when measuring LUM using census units. Furthermore, we suggest that researchers assure that they are using units of a meaningful geographical scale when examining the LUM active transport relationship.

P1.131

A qualitative examination of the perceptions of parents on the Canadian Sedentary Behaviour Guidelines for the Early Years

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: Minimizing sedentary behavior, in particular screen-based sedentary behavior, during the early years is important for healthy growth and development. Consequently, new Canadian Sedentary Behaviour Guidelines for the Early Years (aged 0-4 years) were recently released. Researchers are unclear what messages should supplement the guidelines when disseminating them to parents and when using the guidelines in behaviour-change interventions to increase adoption. The objective of this study was to qualitatively examine parents' perceptions of the new Canadian Sedentary Behaviour Guidelines for the Early Years.

Methods: Parents with a child ≤ 4 years who attended a child care centre were purposefully recruited from child care centres. A total of 7 semi-structured focus groups with 2 to 5 parents were conducted from August to November, 2013 by a trained and experienced moderator. Participants were asked a series of open-ended questions pertaining to the sedentary behaviour guidelines information sheet. Overarching themes were identified and emergent themes were discussed and refined.

Results: For the most part parents thought the guidelines were clear and did not disagree with the recommendations per se. However, some confusion arose around the value of some sedentary activities such as reading and coloring for social and cognitive development. Many parents described feeling guilty after reading the guidelines and perceived several barriers in meeting the daily recommendations. Common barriers included the need to balance multiple demands of family life, the prevalence and accessibility of screen technology, and the weather and built environment where families live. Parents expressed the importance of communicating the guidelines early enough for good habits to be established and the need for realistic strategies and ideas to help them meet the recommendations.

Conclusions: Overall the findings indicate that gain-framed messages around the role of screen-based and non-screen-based sedentary behavior for children's cognitive and social development might be most effective for adoption of the guidelines. Furthermore, providing parents the guidelines early with resources for minimizing sedentary behavior should also be considered. Future research is needed with other demographic groups of parents to confirm and potentially build upon these findings.

P1.132

Psychosocial Correlates of Perceived Neighborhood Accessibility and Availability of Recreational Facilities at Home and in Neighborhoods among US Youth

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: To enhance the effectiveness of environmental interventions on behavior change, it is crucial to understand how neighborhood and home contexts associate with psychosocial constructs. This study seeks to document associations between activity-related psychosocial correlates and perceived neighborhood accessibility of exercise facilities, home activity equipment availability, and availability of neighborhood supports for physical activity within a sample of US teens.

Methods: Preliminary cross-sectional data from the 2014 NCI Family Life Activity Sun Health and Eating (FLASHE) internet based survey were used (N=1232, 47.9% boys, aged 11-18 years old). The surveys collected data on activity-related psychosocial correlates (motivation, attitudes, norms, self-efficacy, social support, and barriers), perceived neighborhood accessibility, availability of activity equipment at home/in the neighborhood, and demographic variables. Pearson's correlations and multivariate linear regression models were conducted (with adjustments for age, gender, height, and weight) to examine the association between perceptions of the home and neighborhood environments and psychosocial factors.

Results: Positive correlations among availability of home activity equipment, neighborhood accessibility, and neighborhood availability of exercise facilities were found ($r=0.11-0.32$, $p<0.001$). Attitudes, motivation, self-efficacy, norms, and social support were positively associated with perceptions of neighborhood accessibility ($\beta=0.05-0.09$; $p=0.001-0.01$), availability of home activity equipment ($\beta=0.22-0.33$; $p<0.001$), and availability of neighborhood exercise facilities ($\beta=0.18-0.28$; $p<0.001$). Self-report of poor neighborhood accessibility ($\beta=-0.10$; $p<0.001$), lower availability of home activity equipment ($\beta=-0.25$; $p<0.001$), and fewer neighborhood exercise amenities ($\beta=-0.20$; $p<0.001$) were related to greater barriers to physical activity. Compared to girls, boys reported more exercise equipment ($p<0.001$) and higher frequencies of use ($p<0.001$) at home. Youth who used home activity equipment more frequently reported fewer barriers to being active ($\beta=-2.24$; $p<0.001$), a more favorable attitude toward exercising ($\beta=3.08$; $p<0.001$), greater motivation ($\beta=2.62$; $p<0.001$), more positive norms for physical activity ($\beta=1.89$; $p<0.001$), higher self-efficacy ($\beta=2.01$; $p<0.001$), and greater social support ($\beta=2.20$; $p<0.001$).

Conclusions: Associations between home environment, neighborhood environment, and psychological constructs related to physical activity were found. Further analysis of how psychosocial correlates mediate the associations between perceptions of the home and neighborhood environment and activity levels may guide development of interventions designed to reduce the observed decline in physical activity among youth.

P1.133

Individual experiences following a six month exercise intervention: a qualitative study

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

Dropout is a common problem in various exercise interventions. The individual's experience is believed to greatly impact dropout, yet little is known about the individual experiences of taking part in exercise interventions. The aim of this study was to gain understanding of participants' personal experiences in relation to participating in an exercise intervention.

Methods:

A qualitative approach with semi-structured interviews was conducted with eight informants (male_n = 3; female_n : 5) aged between 26 to 47 years, whom all had participated in a six month exercise intervention with individual coaching based on Self-Determination Theory and Motivational Interviewing. The interviews were analyzed thematically with an inductive approach.

Results/findings:

Aspects that influenced the informants' participation, motivation and adherence to the exercise intervention could be linked to three themes: For the greater good, Self-awareness: knowing, and The individual's context. In relation to the themes, it was discussed to what extent the informants felt that the intervention was adapted to fit their specific needs.

Conclusions:

This study highlights the importance of tailoring exercise interventions to better support the individuals' specific needs.

P1.134

Recruitment and retention in physical activity promotion: A family-based focus group study

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: Family-based interventions present a much-needed opportunity to increase children's physical activity levels. However, a review of 144 trials reported that only 38% met recruitment targets. This may lead to underpowered intervention evaluations, costly study extensions, and reduced generalisability. Following the 'Health Promoting Family' model, a *whole family* approach (including the child, parents, siblings, and other informal carers), may be required in family-based interventions. This study therefore aimed to engage with the whole family to understand how best to recruit for, and retain participation in, physical activity research.

Methods: Families (including a child aged 8-11 years, their parent(s), siblings, and others) were recruited through schools and community groups. Semi-structured family focus groups were conducted. Families were asked to hierarchically sort cards listing the possible benefits of, and the barriers to, being involved in physical activity research and other health promotion activities. Items considered most relevant were highlighted, and additional items were suggested. Duplicate content analysis was used to identify themes and develop a coding frame.

Results/findings: Eighteen 'target' children (mean age 9.3±1.1y, 61% female) and their families (comprising 32 children (<18y) and 33 adults (including parents, grandparents, and older siblings)), completed the focus groups. Social, health and educational benefits were cited as being key for involvement in physical activity research, with emphasis on children experiencing new things, developing character, and increasing social contact (particularly for shy children). Children's enjoyment was also given priority (unsurprisingly, more so by the children themselves). The provision of child care or financial reward was not considered sufficiently appealing for either recruitment or retention. Increased time commitment or scheduling difficulties were quoted as the most pertinent barriers to becoming, and staying, involved (especially for families with multiple children), but parents commented these could be overcome if the potential value of participation for children was clear.

Conclusions: Lessons learned, particularly around emphasis on social and educational benefits in addition to health benefits, may contribute to the development of effective recruitment and retention strategies. Time investments and scheduling options should additionally be considered in designing physical activity interventions and in engaging families in health promotion activities.

P1.135

Fundamental movement skills in relation to weekday and weekend physical activity in preschool children

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Purpose: Distinct patterns of physical activity have been observed in young children on weekdays and weekends. The identification of factors that are associated with physical activity behaviour during these periods could help to develop effective interventions. This cross-sectional study aimed to examine associations between fundamental movement skills (e.g. catch, jump, run) and weekday and weekend physical activity among preschool children living in deprived communities.

Methods: Six locomotor skills and 6 object-control skills were video-assessed using The Children's Activity and Movement in Preschool Study Motor Skills Protocol. Physical activity was measured via hip-mounted accelerometry. A total of 99 children (53% boys) aged 3-5 years (M 4.6, SD 0.5) completed all assessments. Multilevel mixed regression models were used to examine associations between fundamental movement skills and physical activity. Models were adjusted for clustering, age, sex, standardised body mass index and accelerometer wear time.

Results: Boys were more active than girls and had higher object-control skill competency. Total skill score was positively associated with weekend moderate-to-vigorous physical activity ($p=0.034$) but not weekday physical activity categories ($p>0.05$). When subdomains of skills were examined, object-control skills was positively associated with light physical activity on weekdays ($p=0.008$) and with light ($p=0.033$), moderate-to-vigorous ($p=0.028$) and light- and moderate-to-vigorous ($p=0.008$) physical activity at weekends. Locomotor skill competency was positively associated with moderate-to-vigorous physical activity on weekdays ($p=0.016$) and light physical activity during the weekend ($p=0.035$).

Conclusions: The findings suggest that developing competence in both locomotor and object-control skills may be an important element in promoting an active lifestyle in young children during weekdays and at weekends. The findings also open up the possibility that different types of movement skills may be required for the promotion of activity of different intensities and at different time periods or vice versa. Longitudinal research is needed to better understand the nature of the relationships between motor skill competence and physical activity.

P1.136

A multi-layered ecological approach to predicting active transport to school.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Distance is arguably the most important influence on children's use of active transport (AT) to school; however, this relationship is complex and may be moderated by other individual, interpersonal, and environmental factors. Hence, the aims of this study were to investigate, using a multi-layered ecological approach, whether (i) gender, (ii) biological maturation, (iii) perceived family support for physical activity (PA), and (iv) socio-economic deprivation influence the relationship between distance to school and AT.

Methods: Participants were 610 children (11-12 years, 334 females) recruited from seven schools in Leicestershire, UK. Gender, family support for PA, and AT were self-reported by the child. Home postcodes were used to determine Index of Multiple Deprivation scores as an indicator of socio-economic deprivation. Distance to school (km) was calculated using home and school postcodes. Years from age at peak height velocity (APHV), as an indicator of biological maturation, was predicted using an anthropometric based, gender specific equation. Logistic regressions were used to examine the hypotheses with mode of transport (active versus inactive) entered as the binary dependent variable.

Results: Of the 610 children, 35.4% used AT to school. The average distance to school was 4.5km ($SD = 5.0$) and 1.29km ($SD = 1.34$) for active travellers. Distance to school predicted AT (OR: 0.005, 95% CI: 0.002, 0.014, $p = 0.000$). In subsequent regression models, APHV (OR: 3.602, 95% CI: 1.447, 8.963, $p = 0.006$), family support for PA (OR: 0.257, 95% CI: 0.108, 0.613, $p = 0.002$) and multiple deprivation (OR: 3.537, 95% CI: 1.168, 10.717, $p = 0.025$) significantly moderated the relationship between distance and AT. Simple slopes analyses revealed that distance to school had a greater negative impact on the uptake of AT in late-maturing, more deprived children with low family support of PA.

Conclusions: This study provides evidence that, although distance to school might be the strongest predictor of AT, this relationship is complex. Late-maturing, more deprived children should be targeted to help increase AT uptake, although more work is needed to understand the perceptions and determinants of AT in these population subsets.

P1.137

Longitudinal changes in active commuting and changes in recreational and total physical activity in adults

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: To strengthen our understanding of the population impact of promoting active commuting, we examined longitudinal associations between change in time spent in active commuting and change in recreational and total physical activity over three years.

Methods: Adult commuters working in Cambridge, UK completed questionnaires in 2009 and 2012. Commuting was assessed using a validated seven-day travel diary, and physical activity was assessed using the Recent Physical Activity Questionnaire which measures transport, recreational, home and work-related activity. We used multivariable multinomial logistic regression models to examine associations between change in time spent in active commuting and tertiles of change (large decrease, small decrease and large increase) in recreational and total physical activity, adjusting for potential confounders.

Results: 469 participants (67% women, mean age 44 years [SD 11.1]) provided valid travel and physical activity data at both time points. Total time spent in active commuting increased in 30% (n=136), was maintained in 26% (n=120) and decreased in 43% (n=197) of participants. A decrease in active commuting was associated with a greater likelihood of a large decrease in total physical activity (relative risk ratio [RRR] 2.12, 95% CI 1.09, 4.11). Correspondingly, an increase in active commuting was associated with a greater likelihood of a large increase in total physical activity (RRR 1.82, 95% CI 0.98, 3.37, p=0.059).

An increase in cycle commuting time was associated with a greater likelihood of both a large increase (RRR 2.49 95% CI 1.25, 4.96) and a large decrease (RRR 2.99, 95% CI 1.43, 6.29) in total physical activity. However, participants whose cycle commuting increased and total physical activity decreased reported higher baseline physical activity than those in whom both increased (930 vs. 471 min/week respectively, p=0.001). No associations were seen between changes in time spent walking for commuting and total physical activity, or between changes in active commuting and recreational physical activity.

Conclusions: Changes in active commuting were associated with commensurate changes in total physical activity and we found no compensatory decrease in recreational physical activity. Promoting active travel has potential as a public health strategy to increase physical activity, particularly in those who are inactive.

P1.138

Exploring children's compliance to wearing wrist and hip mounted accelerometers

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Accelerometers are the most widely used objective measure of child physical activity (PA), but varied compliance to monitoring protocols and lack of consensus over monitor wear time criteria are key limitations. This study explored wrist and hip worn accelerometer compliance among children aged 9-10 years.

Methods: One hundred and twenty nine Liverpool schoolchildren (79 girls) wore an ActiGraph GT3X+ (AGhip) and GENEActiv (GAwrist) accelerometer on the right hip and left wrist respectively for seven days. Raw acceleration data were processed and sorted by weekday and recording day. For each monitor, the number of included participants was calculated based on different inclusion criteria. Mean daily valid wear time and number of valid days were calculated, and paired samples t-tests assessed wear time differences between monitors. Repeated measures ANOVAs examined the effect of monitoring days and order of monitoring days on monitor wear time.

Results: AGhip and GAwrist data were available for 115 and 128 children, respectively. Based on 9 hours of wear time 28 (24.3%) and 53 (41.4%) children wore the AGhip and GAwrist respectively, for 7 valid monitoring days. AGhip and GAwrist sample sizes decreased by 14.7% and 7.9% respectively when inclusion criteria included 1 weekend day. Using inclusion criteria of ≥3 days, ≥9 hours wear per day, GAwrist mean week wear time (15.67±2.82) and number of valid days (5.77±1.48) was significantly higher than AGhip mean week wear time (14.19±1.81) and number of valid days (5.22±1.59) (p<0.001). For both monitors, wear time was significantly higher on Fridays compared to Sundays (p<0.01). Recording day wear time was lowest on day 6 (10.94±4.47) and day 7 (13.63±5.33) for AGhip and GAwrist, respectively. AGhip and GAwrist MVPA estimates differed by 3.07 minutes per day and 2.73 minutes per day respectively between days with the highest and lowest wear time, depending on number of required valid days.

Conclusions: Wear time and number of valid days were significantly higher for GAwrist, and wear time for both monitors was higher during weekdays. Awareness of monitor wear site compliance may lead to better compliance and more reliable PA estimates in future PA studies.

P1.139

Electrically assisted biking; classified as physical activity?

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: Electrically assisted biking (EAB) have gained large interest as transportation mode. It is an environmentally friendly alternative compared to car driving, and might have the potential for getting car drivers start cycling and be more physically active. On the other side, the amount of physical activity will possibly be lower than bicycling without an electric assistant, and EAB also have the potential of getting bicyclists stop bicycling, i.e. being less active. It is not well documented to what degree using an EAB might contribute to moderate-to-vigorous intensity physical activity (MVPA). The aim of the present study was to examine difference between EAB and regular biking in a cycle-to-work setting regarding time spent in MVPA.

Methods: Six men and two women (23-55 yrs) with Body Mass Index of 21-27 kg·m⁻² performed outdoor cycling on both a regular- and an electric assisted bike on both flat (8.2 km with elevation 18 to 35 metre above sea level) and uphill/downhill (7.1 km with elevation 18 to 83 metre above sea level) routes in a random order. Cycling time, speed and oxygen consumption were recorded using a portable oxygen analyser with a GPS receiver. Resting metabolic rate (RMR) was obtained by indirect calorimetry with a canopy hood according to international guidelines. The cut point defining MVPA was 3 times RMR. Differences between variables were analyzed using related-samples Wilcoxon signed rank test.

Results: Speed was significantly increased ($P=0.012$) and cycling time significantly reduced ($P=0.011$) during EAB compared to regular biking. Median time spent in MVPA per 10 km was significantly lower during EAB both at flat (median (interquartile range); 29.3 (3.4) vs. 23.8 (4.0) min, $P=0.011$) and uphill/downhill biking (34.5 (7.4) vs. 25.4 (3.9) min; $P=0.012$) compared to EAB. In total, 96 and 95% of cycling time was classified as MVPA during EAB at flat and uphill/downhill biking vs. 98 and 94% during regular biking, respectively.

Conclusion: Although, lower amount of MVPA per km, most time spent during EAB seems to be classified as MVPA. EAB may contribute to increase the percentage of people achieving physical activity recommendations.

P1.140

ASSOCIATION OF HDL CHOLESTEROL AND PHYSICAL ACTIVITY IN ASIAN INDIANS

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Insufficient physical activity levels have been linked to low HDL cholesterol(HDL-C) levels, a major risk factor for cardiovascular disease. While Asian Indians have been shown to have low HDL-C levels, it is not clear as to how much this can be attributed to low levels of physical activity. We therefore attempted to assess the association of physical activity patterns with low HDL-C in Asian Indians.

Methods: The Indian Council of Medical Research- India Diabetes (ICMR-INDIAB) study is a large national ongoing survey on non-communicable diseases on a representative population of every state in India. For this study, we used data from seven states in the north, south, west, east and northeast of the country. Of the 27,221 participants selected, 27,123 (response rate 99.6%) were included in the analysis. Physical activity was assessed using a specially developed, reproducible and validated questionnaire for use in India called the Madras Diabetes Research Foundation (MDRF) Physical Activity Questionnaire. Based on physical activity level(PAL), participants were categorized into sedentary, moderate and vigorous activity levels and those in the latter two levels were classified as active. Lipid profile was assessed in every 5th subject, using a fasting venous blood sample. Low HDL-C was defined as levels <40 mg/dl in men and <50 mg/dl in women.

Results/ findings: More than half (55.8%) of the 27,123 participants were inactive, with the prevalence of inactivity being higher in urban compared to rural areas(66.0% vs. 51.5%; $p<0.001$). Only 11.9% of participants engaged in any recreational activity. Although total cholesterol and triglycerides were higher in the inactive compared to the active group, there was no significant difference in the mean HDL-C levels between the groups (Inactive vs. active: Male 38.7 ± 11.3 vs. 39.0 ± 11.3 ; female: 42.1 ± 11.7 vs. 41.9 ± 11.2 mg/dl). While low HDL-C [Odds ratio (OR):1.3, 95% CI 1.2-1.4; $p<0.001$] and high triglycerides [OR 1.2, 95% CI 1.1-1.3; $p<0.001$] were associated with inactivity, the association was lost for Low HDL-C, when adjusted for age and gender [OR 1.01, 95% CI 0.9-1.1; $p=0.860$].

Conclusions: HDL-C levels were low in this Asian Indian population, irrespective of physical activity levels.

P1.141

Recommendations for the translation, implementation and evaluation of physical activity interventions within routine diabetes care

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Physical activity is an essential component of management for individuals with Type 2 diabetes. However, despite a strong evidence base little is known about how to translate research findings into practice. Recommendations are available on how to translate and implement findings for diabetes prevention, but no such recommendations exist for the important area of diabetes management. The aim of this study was to scope the literature for useful and practical information to support the three stages of *translation, implementation and evaluation* of physical activity interventions for routine diabetes care.

Methods: Three methodologies were employed: (i) a systematic review of the current literature; (ii) a process evaluation of a physical activity consultation service implemented within routine diabetes care; and (iii) a review of other guidelines addressing similar recommendations for health interventions within everyday practice e.g. the IMAGE Toolkit for the Prevention of Type 2 Diabetes in Europe.

Results: Translation of research findings should include: exploration of current practice and health care structure; familiarity with the target population; feasible intervention protocols; and partnership with external organisations. Effective implementation of translated interventions should include: integration with current diabetes care; a financial plan; an intervention champion; regular contact to improve retention; training and ongoing support for intervention staff; measures of protocol fidelity; flexible resources; communication with stakeholders; and streamlined administration processes. All interventions should conduct an evaluation which includes: a pre-developed evaluation plan; appropriate measurable outcomes; qualitative data; long-term follow-up; cost evaluation; and publication of plan of action for the evaluation findings.

Conclusions: These are the first recommendations presented for the critical area of physical activity and Type 2 diabetes care. Researchers and health professionals should use these recommendations to facilitate the future delivery and adoption of sustainable physical activity interventions within routine diabetes care.

P1.143

The physical activity profiles of adult South Asians in England

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

It is widely accepted that UK South Asian ethnic groups are less physically active than the White British, but we know very little about what types of physical activities Indians, Pakistanis and Bangladeshis actually do. We aimed to identify which types of activities contribute to overall physical activity in South Asians in England, in comparison to the White British ethnic group. We investigated how this varies according to sex and age within each ethnic group.

Methods:

The Health Survey for England is a nationally representative, cross-sectional survey which is conducted annually. In 1999 and 2004 the samples for ethnic minority populations were boosted, allowing for more detailed analysis on ethnic minority physical activity. We merged the two survey years and analysed the self-reported physical activity measures available. We analysed data from over 18,000 people aged 16 and above. The proportions of total physical activity achieved through walking, sports, housework and DIY were calculated. We stratified by sex and age-group and used ANOVAs to examine associations between ethnic group and socioeconomic status.

Findings:

In all ages and ethnic groups, including the White British population, all women had more activity through housework in comparison to men. The percentage that sports contributed to activity declined with age for both men and women in all ethnic groups, but increased for housework. Sports contributed a lower proportion to total activity in South Asian women as compared to the White British at all ages, but this was not the case for South Asian men. Indian women in the 16 to 34 age-group had a similar proportion of walking as the White British (19% versus 20%), and the ANOVA results indicated that this was likely to be explained by social class rather than ethnic background.

Conclusions:

UK South Asians are active in different ways, and this varies by age, sex and socioeconomic status, but there are also some similarities. Walking was a significant contributor for all age groups and ethnicities and is an accessible activity. These results can be used to appropriately target population level interventions for increasing physical activity levels in adult ethnic minority populations.

P1.144

Gross motor skills of rural South African preschool children

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Objective: This study aimed to evaluate gross motor skills of rural preschool and Grade-R (reception year) children, and investigate the relationship between gross motor scores (GMS) and gender, anthropometry, school type, and physical activity (PA). This is formative work for the development of an intervention.

Methods: Children (n=122; preschool mean age 4,99±0,64 years, Grade-R mean age 4,91±0,71) were recruited from schools in a rural village in Mpumalanga, South Africa. Gross motor skills were assessed using the Test for Gross Motor Skills – Version 2. Participants' height and weight were measured; PA was assessed using ActiGraph GT3X+ accelerometers.

Results: Mean height-for-age and weight-for-age Z-scores for the sample were -0,39±1,01 and -0,28±0,97, respectively. Seventy-four percent of participants had a normal BMI; thinness was observed in 21% of participants, and 5% were classified as overweight/obese. There were no differences in body composition variables between the boys (n=53) and girls (n=69). The average gross motor quotient (GMQ) score was 108 for the total sample. Three percent of participants were classified as very superior, 14% as superior, 28% as above average, 46% as average, 7% as below average, 2% as poor, and one participant was classified as very poor. There were no significant differences between boys and girls. Proficiency was the highest in (>80% for each sub-item) running, the hop and the kick. Proficiency was poorest in the stationery dribble (46%), underhand roll (51,8%) and overhand throw (52%). Locomotor scores were also significantly associated with daily light and moderate-to-vigorous PA (r=0,195; p=0,038). There were no significant correlations between GMS and body anthropometric variables. Participants in Grade R had significantly better GMQ scores (p<0,001), object control standard scores (p=0,005) and locomotor standard scores (p=0,004) than participants in preschool. Daily moderate-to-vigorous PA (n=113) was significantly associated with GMQ (r=0,27; p=0,004) and locomotor standard scores (r=0,317; p=0,001).

Conclusions: This study is the first to provide gross motor skill data for rural preschool children in South Africa. These findings suggest that intervention strategies should promote moderate-to-vigorous PA, and include a strong object control component. Furthermore, it is likely that different strategies would be required for preschool and Grade-R children.

P1.145

Worksite stair-climbing intervention: effectiveness and transferability using the RE-AIM framework

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SIG: Yes, Policies and environments

Awards: No

Purpose:

The main objective of our study was to evaluate under real-life conditions the short-term and long-term effectiveness of a stair-climbing promotion program in a worksite in Paris, France. The second objective was to describe the process of intervention using a standardized tool, the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework.

Methods:

We conducted a controlled before-and-after study in Paris, France, in two corporate buildings of the same company. In the intervention building, two stair-climbing interventions of one month each using signs (intervention no. 1) and enhancements in aesthetics of stairwells (intervention no. 2) were performed. Stair climbing was measured continuously with automatic counters. The process of intervention was described through 3 dimensions of the RE-AIM framework (Adoption, Implementation, Maintenance) that fit with stair-use interventions.

Results:

Effectiveness: Stair climbing increased during the second intervention compared to the baseline level (difference between sites = +6.2 counts/day/100 employees, 95% CI = 3.2-9.2) and remained elevated 7 months after the end of interventions (difference between sites = +4.0 counts/day/100 employees, 95% CI = 0.5-7.4). **Adoption:** Interventions were implemented by 4 staff members who described the first intervention as "difficult" (n=2) and "rather difficult" (n=2) and the second intervention as "rather easy" (n=3) and "rather difficult" (n=1). The main difficulty was to match the internal rules of communication with important criteria of intervention. **Implementation:** The main aspects of intervention were implemented as intended even though some adaptations had to be made. **Maintenance:** After the end of interventions, a third intervention entirely designed and implemented by the company has been performed.

Conclusion:

We provide an example of a successful worksite intervention with an objective measure of stair climbing. The effect on stair climbing lasted up to 7 months after interventions. Barriers to implementation in this particular corporate worksite setting were identified. Locating the prompts at the most visible spot was especially challenging. However, solutions were found and the program was sustained at the setting level after the end of the study.

P1.146

Physical activity preferences and attitudes among inpatient adults with mental illness

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Physical activity is effective for managing poor physical health and for improving psychological wellbeing. The aims of this study were to determine the preferences for, barriers to and attitudes towards physical activity among adults with mental illness in an inpatient psychiatric setting and to explore gender differences.

Methods: 101 inpatient adults (72% females, mean 40.7 years; SD 14.5) were recruited from a private psychiatric hospital. Questionnaire items assessed interest in activity; reasons for doing activity; preferences for activity types, contexts and assistance; barriers and general knowledge regarding the benefits of physical activity. Data were analysed using (i) descriptive statistics and (ii) Pearsons chi-square to test for differences by gender.

Results: Participants expressed a high level of interest (mean 7.70, SD 2.3; on a scale of 1-10) in doing activity as an inpatient and the primary reasons were to control weight (98%); maintain good health (98%); manage stress (95%), and improve emotional wellbeing (94%). About two thirds of participants preferred physical activity that they can do on their own (69%), at a fixed time (68%) and with a set routine and format (66%). The most preferred activity type was walking (78%) and preferred sources of assistance were a personal trainer to recommend (28%) and lead (25%) activities and an exercise physiologist to design (32%) activities. Lack of energy (76%), motivation (73%) and feeling too tired (74%) were common barriers. Over 90% perceived that activity is beneficial for managing psychological wellbeing, heart disease, quality of life and stress, however fewer than half perceived benefits for post-traumatic stress disorder, bipolar affective disorder, chronic fatigue and schizophrenia. Women were more likely than men to prefer activities done with others of the same gender ($p = 0.001$) and activities done with people at the same level of ability ($p < 0.001$).

Conclusions: Inpatient adults with mental illness are interested in physical activity. Programs could focus on walking; emphasise benefits of managing weight, physical health, stress and mental wellbeing, and same gender groups for women. Specific strategies are needed to redress fatigue-related barriers.

P1.147

Who are the users of a newly built bike path? A 10-week follow-up study in the city of Graz, Austria

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

The construction of a new bicycle path is a substantial financial investment. Little is known whether the users of a newly built bicycle path change during the first months after the finishing of the construction. The aims of the study were to investigate: (1) who uses the newly built path in terms of socio-demographic and bicycling behavior characteristics; (2) whether the bike path users differ between the 0- and 10-week measurements; and (3) how many of these cyclists meet the physical activity recommendation by cycling only.

Methods:

In July 2014 and September 2014 two cross-sectional surveys were conducted. Altogether 730 (41% women) bicycle rides were observed and 137 (43% women) people filled in the questionnaires. At the second measurement only those completed the questionnaire who did not fill it in during the first survey. Chi² test and comparison of the means were used to analyze differences.

Results/findings:

About half of the cyclists were older than 45 years (55%) and had finished polytechnical school or university (51%). The majority (40%) cycled to work. The socio-demographic characteristics (gender, age, education) and the bicycle behavior of the cyclists did not differ between the two measurements. A fifth of the participants (20%) reported to cycle more often after the opening of the bicycle path and only 4 percent did not cycle before the opening of the path. Assuming a 3.5 min per km cycling velocity, altogether 46 percent of the cyclists (no difference between the measurements) achieved the physical activity recommendation (≥ 150 min of cycling per week).

Conclusions:

Our results show that the socio-demographic and physical activity behavior profile of the users of a new cycling infrastructure remains unchanged during the first access months. The results suggest that while the new infrastructure does not seem to attract new cyclists in the short run it may increase the cycling activity among the users. A third measurement is planned nine months after the opening.

P1.148

Five x 30 versus 150 minutes: factors associated with meeting the old and current physical activity guidelines in Scotland

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective:

Current UK guidelines for moderate to vigorous physical activity (MVPA) recommend 150 minutes per week. Prior to 2011, they stipulated that 30 minutes of MVPA should take place on at least 5 days per week. This study investigated the factors associated with meeting the old and current MVPA guidelines and any differences between them. Factors associated with any participation in the different domains of physical activity (PA) were also investigated.

Methods:

The analysis used adult (age ≥ 16) data from the nationally representative 2012 Scottish Health Survey (n=4807). Bi- and multivariate analyses were used to investigate the factors associated with meeting both MVPA guidelines. Logistic regression models were run to investigate the factors associated with participation in the different domains of PA.

Results:

Demographic (age, sex) and health factors (self-assessed health, mental wellbeing) were strongly associated with meeting the current MVPA guidelines (all $p < 0.001$). Socioeconomic factors were not associated except for economic activity status ($p < 0.001$). The change in guidelines increased the range of factors associated with activity levels but did not affect the patterning.

Socioeconomic factors were associated with participation in certain PA domains. For example, those in the highest income quintile were more likely to participate in sport and exercise than those in the lowest (OR 1.60 (CI 1.17-2.17)) and they were less likely to be physically active at work (OR 0.42 (CI 0.29-0.62)). However socioeconomic factors were less influential on walking participation. Women were more likely to walk than men, and walking increased with age in women (both $p < 0.01$). Women were more likely to participate in housework and less likely to participate in manual work/DIY than men (both $p < 0.001$).

Conclusions:

The change in MVPA guidelines did not substantially alter the factors associated with meeting them. Lower participation levels in sport and exercise amongst those in lower socioeconomic groups are counterbalanced by an increased likelihood of occupational activity. Current trends indicate that occupational activity levels are declining therefore action may be required to ensure total PA levels remain constant amongst this group. The findings reinforce the importance of walking in addressing inequalities in PA participation.

P1.149

Transport-related physical activity in community-dwelling older adults living in a highly walkable setting

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: To objectively assess transport-related physical activity (steps) in community-dwelling older adults, and to assess trip rate in relation to meeting physical activity (PA) guidelines.

Methods: We drew data from our ongoing Active Streets, Active People study in the City of Vancouver's highly walkable downtown core (n=193). At baseline (Sep-Oct 2012), we fitted participants with accelerometers (GT3X+, ActiGraph LLC) and GPS monitors (Qstarz BT-Q1000XT). Using a geographic information system, we manually assigned trip start- and end times to GPS trips. We identified primary trip mode based on speed, accelerometry and participant trip diaries. A valid person-day was defined as having both GPS (≥ 1 trip) and accelerometry data (≥ 600 minutes wear time, allowing for < 2 minutes of < 100 counts/minute); we excluded bicycle trips (n=87). We grouped person-days into high (≥ 4 trips) or low trip rates (≤ 3 trips). We assessed transport-related steps (by any mode) and non-transport-related steps between days with high versus low trip rates using multilevel regression (adjusting for multiple observations per person); we used logistic regression to estimate odds for meeting PA recommendations for older adults ($\geq 7,000$ steps/day; referent: low trip rate).

Results: In this preliminary analyses, we included 120 older adults (71.2 \pm 7.3yrs, 67% women), who recorded 1,816 GPS trips (across a median of 4 days). Overall, walk trips were most commonly recorded (65%), followed by car (24%) and transit trips (11%). Walk and transit trips accrued comparable steps on average (1160 vs. 1041, respectively), which was significantly higher than car trips (195 steps, may include walking segments). On person-days with high trip rates, transport-related steps (by any mode) were significantly higher compared with days of low trip rates (4,789 vs. 2,273 steps); non-transport-related steps were similar (4,255 vs. 5,000 steps). Person-days with high trip rates were more than 3 times more likely (OR: 3.5, 95%CI 3.3-3.7) to meet PA recommendations ($\geq 7,000$ steps/day).

Conclusions: Transport-related steps make a substantial contribution towards daily PA recommendations in community-dwelling older adults, in particular because they do not appear to meaningfully displace PA from other sources.

P1.150

"I want to bike, but I can't!" – profiling the children who would prefer to cycle to school

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SIG: Yes, Policies and environments

Awards: No

Introduction: Cycling to school is associated with increased physical activity (PA) and improved cardiorespiratory fitness among children. However given its very low prevalence, little information on the correlates of cycling to school exists in North America. To address this research gap, we explored the factors associated with children's stated preference for cycling in a large cross-sectional sample of children in Toronto, Canada.

Methods: A purposive sample of 16 schools was selected in areas that differed in neighbourhood type (e.g., pre- or post-World War II) and median household income (low vs. high). Children (N=989; 54.0% girls; 9-12 years) and their parents completed school travel questionnaires and drew the child's route to/from school. Children also wore an Actigraph accelerometer for 7 days. Based on their preferred and reported school travel mode, children were classified as "cyclists", "potential cyclists" (e.g., if they indicated that they would prefer to bike to school) or "non-cyclists". Binary logistic regression models compared potential cyclists and non-cyclists with respect to measures of neighbourhood and household SES, home-school distance and PA.

Results: The proportion of children classified as cyclists, potential cyclists and non-cyclists were respectively 2.4%, 38.9% and 59.6%. Potential cyclists were more likely to have access to a bicycle (OR=2.10; 95% CI=1.12-3.94), to live in a post-World War II neighbourhood (OR=1.42; 95% CI=1.06-1.91), to be older (OR=1.25 for each year of age; 95% CI=1.01-1.55) and to have two parents working full-time (OR=1.51; 95% CI=1.00-2.28). For each additional kilometer in home-school distance (OR=1.25; 95% CI=1.09-1.43) and each additional 100 Actigraph average counts/minute (OR=1.12; 95% CI=1.01-1.24), children were more likely to be potential cyclists. The final model explained 6.8% of the variance.

Conclusion: Our findings indicate that about 40% of children who did not cycle to school would prefer to do so; therefore future studies should examine the feasibility of translating these stated preferences into behaviour change. We noted that potential cyclists differed from non-cyclists with respect to individual, socio-economic and built environment characteristics. Future research is warranted to confirm these preliminary findings and to examine how such preferences might be harnessed in supporting active travel initiatives.

P1.151

Physical activity after childhood cancer: Exploring survivors' experience of physical well-being

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SIG: Yes, Cancer Prevention and Management

Awards: No

Purpose: The purpose of this longitudinal qualitative study was to explore how participation in leisure-time physical activity influenced experiences of physical well-being among survivors of childhood cancer.

Methods: A multiple case study approach involving repeated in-depth interviews over a three month period with survivors of childhood cancer (N=4) was used to explore changes in experiences of physical well-being overtime. A cross-case analysis was used to emphasize themes that illustrated the survivor's shared experiences of physical well-being in the context of cancer and leisure-time physical activity.

Results: Participation in recreational cycling positively shaped survivor's experiences of physical well-being through (a) gaining strength and physical fitness; (b) overcoming fatigue; and (c) enhancing physical self-efficacy.

Conclusions: This study provides a context for understanding the role that leisure-time physical activity plays in the lives of survivors post-treatment. It is important to continue advancing our understanding of unstructured activities that prioritize enjoyment, adventure, and autonomy and may also help survivors develop and improve their lives post-cancer.

P1.152

A meta-analysis of moderate-to-vigorous physical activity levels in primary school physical education lessons.

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Objective: Less than half of primary school children (5-12 years) engage in physical activity at levels that meet the World Health Organisation's recommendation of 60 minutes of moderate-to-vigorous physical activity (MVPA) each day. School-based physical education (PE) lessons provide an opportunity for children to engage in MVPA and develop the skills, knowledge and attitudes required for lifelong physical activity. The United States' Centre for Disease Control and Prevention (CDC) recommends that children engage in MVPA for ≥50% of PE lesson time; however a systematic review of studies under non-intervention conditions (published in 2006) found that primary school students participated in MVPA for 34.2% of PE time. This current meta-analysis aimed to update the previous review and determine the percentage of PE lesson time primary school children spend in MVPA.

Methods: The protocol was registered with Prospero (7/5/14). A two-step search strategy was used: 1) nine databases were searched from 2005 to April 2014, and 2) the reference lists of included articles were manually searched for additional studies not previously identified. Studies were eligible for inclusion if they were written in English; assessed physical activity of primary school children (5-12 years) in PE lessons; and used an objective measure of physical activity (i.e., accelerometry, heart rate monitoring, pedometers, observational measures). Two reviewers examined all retrieved articles, assessed risk of bias and performed data extraction using a standardised tool.

Results: The search yielded 5132 articles, of which 74 papers were retrieved and 13 met all inclusion criteria (7 included in the meta-analysis). Nine of the 13 studies were of low-moderate risk of bias. Eight studies measured MVPA through observational measures (e.g. SOFIT), 5 used accelerometry and 1 used heart rate monitoring. The number of PE lessons observed in each study ranged from 2-374. The meta-analysis showed that children spent a mean (SE) 40.3(0.6)% of lesson time in MVPA.

Conclusion: The proportion of primary school PE time spent in MVPA did not meet the CDC recommendation. Interventions to increase MVPA time in PE lessons are needed, and regular monitoring of primary school PE lessons is required to monitor progress towards the MVPA target.

P1.153

Physical education in secondary schools located in low-income communities: A cross-sectional study of physical activity levels, lesson context and teacher interaction.

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Objective: Physical education (PE) has the potential to make an important contribution to students' daily physical activity. However, activity levels within PE are typically lower than international recommendations of ≥50% of lesson time spent in moderate-to-vigorous physical activity (MVPA). Little is known about the PE lesson physical activity levels of students attending schools in low-income areas. This study aimed to describe the: i) physical activity levels of secondary school students in PE classes, ii) lesson context and teacher interactions occurring during PE lessons, and iii) the association between teacher, school or PE lesson characteristics and student physical activity levels in PE lessons.

Methods: A cross-sectional descriptive study was undertaken in 100 Grade 7 PE lessons across 10 secondary schools in Australia. The System for Observing Fitness Instruction Time (SOFIT) tool was used to assess students' MVPA and vigorous physical activity (VPA) levels, lesson context and teacher interaction. Teacher and school characteristics were collected via a survey (teachers' sex, qualification, years of experience, school location, class sex composition, and number of students in the lesson). Mean proportion of lesson time was used to describe physical activity, lesson context and teacher interaction. Associations between each outcome variable and teacher, school and lesson characteristics were examined using 2-sample t-tests and ANOVAS.

Results: Thirty-nine percent of PE lessons were spent in MVPA, and less than 10% in VPA. Lessons within metropolitan schools involved significantly more MVPA than those in regional schools (43.2% v's 37.1%, p=0.04). Male teachers and highly experienced teachers conducted lessons with 2.6% (1.3 minutes, p=0.04) and 3% (1.5 minutes, p=0.02) more VPA than female and less experienced teachers respectively. Larger class sizes spent more time sitting compared to smaller class sizes (34.7% v's 25.5%, p=0.01). Class sex composition was not associated with physical activity, lesson context or teacher interaction.

Conclusions: PE lessons within schools located in low-income areas did not meet international MVPA recommendations. Male teachers, highly experienced teachers, and metropolitan schools conducted more active lessons. As PE has the potential to make an important contribution to low-income students' physical activity levels, improving the quality of PE should be a priority.

P1.154

Does combining the Theory of Planned Behaviour and Common Sense Model of Illness Representations explain walking intentions and ability in people with intermittent claudication?

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objectives: Walking is an underused treatment for people with intermittent claudication (IC). This study evaluated a) whether cognitions about walking treatment defined by the Theory of Planned Behaviour (TPB) explained walking intentions and ability among people with IC; and b) whether illness cognitions defined by the Common Sense Model of Illness Representations (CSM) explained additional variance in walking outcomes beyond the TPB.

Methods: Individuals with IC confirmed by a vascular specialist were recruited from vascular outpatient clinics in three UK NHS hospitals from September 2011 to July 2014. Participants attended one appointment to collect sociodemographic and clinical outcomes, including walking during the past week (International Physical Activity Questionnaire-Short Form), treatment cognitions and intentions (TPB questionnaire), illness cognitions (Revised Illness Perceptions Questionnaire), and walking ability (6-minute walk distance [6MWD]). Two multiple linear regression models evaluated the variance explained in walking intentions and 6MWD by the TPB and CSM, controlling for past waking behaviour. Significance was accepted at $p < 0.05$.

Results: 145 individuals with IC (80% male, mean \pm SD age 66.9 years, 51.5% current or past smoker, 23% previous revascularisation) were included. Mean \pm SD walking intention scores were 22.6 ± 6.0 (scale range 0-28) and 6MWD was 365 ± 107.8 m. Overall, 70.1% and 30.5% of the variance in walking intentions and 6MWD, respectively, was explained. Attitudes ($\beta = .19$, $p = .004$), subjective norms ($\beta = .37$, $p < .001$) and perceived behavioural control ($\beta = .34$, $p < .001$) accounted for 49.5% ($p < .001$) of variance in walking intentions, but illness cognitions explained no additional variance (R^2 change = .007, $p = .529$). Illness cognitions accounted for 20.9% of variance in 6MWD ($p < .001$), with independent contributions by personal control ($\beta = .24$, $p = .004$), risk factor attributions ($\beta = .15$, $p = .048$) and illness coherence ($\beta = .18$, $p = .012$). Treatment cognitions made no significant contribution to variance in 6MWD (R^2 change = .014, $p = .121$).

Conclusions: Treatment and illness cognitions defined by the TPB and CSM explain some but not all the variance in walking intentions and ability in people with IC. Treatment cognitions were better at explaining walking intentions, whereas illness cognitions explained walking ability. Combined, salient theory-based treatment and illness cognitions should be targeted to support increased walking intentions and improved walking ability in people with IC.

P1.155

Behavioral Inhibition and Activation Traits Moderate Subjective Responses to Acute Exercise in College Students

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Background: Individual differences in affective response during exercise may explain variation in exercise behavior. Evidence suggests that Behavioral Inhibition (BIS) and Activation (BAS) traits influence affect and ratings of perceived exertion (RPE) during exercise, though reports are scarce.

Objective: To examine the moderating role of BIS/BAS traits on ratings of affect (pleasantness, arousal, and dominance) and RPE during exercise.

Methods: Participants were selected who fit into one of four groups (high BIS (n=15), low BIS (n=15), high BAS (n=15), and low BAS (n=13)) based on BIS or BAS scales compared to published norms. Participants completed two 30-minute conditions; 1) stationary cycling at 60% relative $\dot{V}O_2$ max, and 2) seated rest. RPE was measured at minute 6 and every 3 minutes thereafter, while arousal, pleasantness, and dominance were measured at minute 2 and every 5 minutes thereafter during both conditions.

Results: Compared to other groups, high BIS participants reported greater RPE at the end of the control condition ($F = 7.778$, $df = 1$, $p = .008$) and greater submissive affect at the beginning of the exercise condition ($F = 4.713$, $df = 1$, $p = .034$). The high BAS and high BIS groups reported greater RPE in response to the initial increase in exercise intensity following warm-up ($F = 5.164$, $df = 1$, $p = .027$) compared to the other groups. High BAS subjects rated exercise as more arousing ($F = 6.834$, $df = 1$, $p = .012$) and the initial increase in exercise intensity following warm-up and the moments prior to cool-down as more pleasant ($F = 5.245$, $df = 1$, $p = .026$, $F = 4.871$, $df = 1$, $p = .032$, respectively) compared to other groups. High BAS participants also found the control condition more unpleasant ($F = 4.943$, $df = 1$, $p = .030$), and reported greater feelings of dominance during the exercise bout compared to the other groups ($F = 7.348$, $df = 1$, $p = .009$). Effects remained after controlling for baseline measures, recall of recent moderate-to-vigorous physical activity level, and ventilatory threshold (an index of exercise training status).

Conclusion: Individual differences in BIS/BAS traits influence subjective responses to acute moderate-to-vigorous exercise and seated rest among healthy college students. Groups scoring high for BIS or BAS trait exhibited more extreme responses to the conditions than groups scoring low for BIS or BAS trait.

P1.156

Greater self-efficacy and group cohesion facilitate adherence to CrossFit exercise

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Group dynamics theory posits that fitness class participation involves both personal and collective factors. Individual attraction to the group (ATG) reflects whether the group satisfies personal needs. Group integration beliefs (GI) reflect individual perceptions about the group's functioning. Both ATG and GI are considered to have task (e.g., goals and objectives) and social (e.g., group relationships) components. Fitness classes are considered minimal groups where participants interact to enhance and protect self-esteem. Greater cohesiveness in fitness classes leads to a social collective and greater adherence; specifically, greater ATG-task has predicted adherence (Carron et al. 1988). CrossFit, a type of group-based high-intensity functional training, has recently gained popularity, yet little research has examined psycho-social factors related to adherence. This study investigated differences in self-esteem and adherence to CrossFit, and also group cohesion for adherers.

Methods: Participants (N=88) attended fitness classes at a university CrossFit gym and consented to participate in a 12-month program evaluation study. More participants were female (51.7%, n=46), white (88.8%, n=79), and had some college education (96.7%, n=86); ages ranged 18-66y (m=29.8±11.5y). Participants completed a self-esteem questionnaire at baseline and a modified Group Environment Questionnaire (mGEQ; 18 items from 1 "strongly disagree" to 9 "strongly agree") at 12-months. Data were analyzed with SPSS 20.

Results: Over 63% (n=56) adhered to 12-months of CrossFit. Adherers reported significantly higher self-esteem at baseline than drop-outs for "confidence to continue exercising with CrossFit" (t=2.53, p=.018), "confidence in establishing and maintaining relationships with people I don't know well" (t=4.46, p<.001), and agreement that "CrossFit activities contributed to my self-esteem" (t=3.12, p=.008). Highest rated mGEQ items were "I enjoy my time with the people in my community" (m=8.5±0.6), "I like the type of exercise we do" (m=8.5±0.7), "I enjoy the social interactions with my community" (m=8.4±1.0), and "I would miss the members of my community if the program ended" (m=8.3±1.0). Examination of sub-scales for adherers showed that ATG-task was highest (8.2±0.9), followed by ATG-social (7.8±1.0), GI-task (7.1±1.8), and GI-social (6.3±2.0).

Conclusions: Results were consistent with previous research on fitness classes showing that self-esteem at baseline and attraction to group tasks were highest for adherers.

P1.157

Occupational physical activity and workplace social capital in relation to coronary heart disease: an interplay?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Several studies have shown that physical activity and psychosocial risk factors at work have interacting effects on musculoskeletal disorders, but it is unclear whether this is also the case for their relation with coronary heart disease (CHD). This study aimed to assess the interaction between occupational physical activity and workplace social capital in relation to coronary heart disease.

Methods: The sample included 14,337 middle-aged men free of CHD at baseline (1994-1998), in whom the incidence of coronary events was followed over a 3 year period. Baseline data were collected through standardized questionnaires and clinical examinations. A theoretical workplace social capital model was developed and The Job Content Questionnaire was used to assess physical activity at work. Cox proportional hazard regression modeling was applied to assess relations with CHD.

Results: During follow-up, 87 new coronary events were registered. After adjusting for socio-demographic and classical coronary risk factors, results showed that both high occupational physical activity (HR 1.17; 95% CI 0.51-2.65) and low vertical workplace social capital (HR 2.17; 95% CI 1.39-3.38) increased the risk for CHD. However, no significant interactions were found.

Conclusion: Results demonstrated that high occupational physical activity and low workplace social capital independently contributed to the incidence of CHD. The synergistic health effects of physical activity and social capital as found in community studies, could not be replicated in an occupational context.

P1.158

Gamification of active travel to school: an evaluation of the Beat the Street physical activity intervention

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SIG: Yes, Policies and environments

Awards: No

Objective: Physical activity (PA) levels in children are low, and use of technology has been partly blamed. Beat the Street is an intervention aiming to get children more active by making technology part of the solution by encouraging participants to walk and cycle around their neighbourhood using walk tracking technology linked to a reward scheme. This pilot study evaluates the impact of Beat the Street on PA behaviours in a sample of schoolchildren in Norwich, UK.

Methods: The intervention was conducted within a neighbourhood in the city for 9 weeks during May-July 2014. Children were recruited to take part in the evaluation via two schools; one located in the intervention neighbourhood, and the other located on the opposite side of the city. All year 4 and 5 children (aged 8-10) were invited at both schools. Recruited children wore an Actigraph accelerometer for 7 days at baseline (May), mid-intervention (July), and 3 months post-intervention (September). From accelerometry we derived mean counts per minute (cpm), by time of day, for each measurement occasion. We examined intention to treat differences in changes in PA between intervention and control children using linear models.

Results: Fifty-one children (34.0%) participated at the intervention school and 29 (51.8%) at the control. The children provided 849 days of data. At baseline, PA levels were higher at the intervention school versus control (e.g. mean cpm during school commute times = 217.15 vs 101.05, $p < 0.001$). Counterintuitively PA declined at the intervention school and increased at the control during the intervention (e.g. during the school commute home -25.71cpm $p = 0.07$ vs +9.95cpm $p = 0.58$). When pre-post intervention PA levels were compared between the intervention and control few statically significant differences were found, with most in a counterintuitive direction. For example, post-intervention PA declined by -32.30cpm ($p = 0.004$) compared to baseline at the intervention school versus -26.00cpm ($p = 0.04$) at the control.

Conclusions: Based on accelerometry, we found no evidence to suggest Beat the Street increased children's PA levels. The few statically significant differences were in a counterintuitive direction. Further work is needed to understand how patterns and level of engagement with the intervention might impact outcomes.

P1.159

Linking parental social influences and youth's physical activity behavior: The mediating role of enjoyment and self-efficacy

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: Physical activity (PA) promotes healthy physical, psychological, and social development in youth. However, most youth are inactive. To better understand potential intervention strategies to increase PA in youth, we examined the associations between parental social influences and PA in youth and considered factors that may mediate these associations. Specifically, we tested a model where perceived parental control and social support (intangible and tangible) influenced youth's enjoyment of PA and self-efficacy beliefs to engage in PA, which in turn influenced youth's in- and out-of-school PA behavior.

Methods: Data for this cross-sectional investigation were collected from youth participating in an ongoing cohort study entitled Monitoring Activities of Teenagers to Comprehend their Habits. Data from 602 youth (Mage=13.4, SD=.6; 56% girls) who completed self-report questionnaires in the spring of 2014 were analyzed using path analysis.

Results: The fit indices for the path model were: $\chi^2 = 32.63$; $df = 8$; $RMSEA = .07$; 90% CI for $RMSEA = .05-.10$; $CFI = .97$; $SRMR = .04$. Tangible support was directly and positively associated with self-efficacy ($\beta = .27$) and enjoyment ($\beta = .31$), intangible support was directly and positively associated with enjoyment ($\beta = .18$), social control was directly and negatively associated with self-efficacy ($\beta = -.15$) and enjoyment ($\beta = -.12$). In turn, self-efficacy was directly and positively associated with in- and out-of-school PA ($\beta = .12-.14$), and enjoyment was directly and positively associated with out-of-school PA ($\beta = .26$). Last, tangible support and social control were indirectly associated with in-school PA, whereas intangible, tangible support, and social control were indirectly associated with out-of-school PA.

Conclusion: Our findings confirm previous research showing that parental influences can promote or hinder PA in youth and suggest youth's enjoyment of PA and self-efficacy beliefs for PA mediate the associations between parental social influences and in- and out-of-school PA. Therefore, encouraging parents to provide support for PA to their children, while reducing controlling behaviors, may help promote PA participation in youth both in- and out-of-school. Future research efforts should be directed to determine how best to promote parental support since youth's perceptions of support for PA related positively to their PA enjoyment, self-efficacy beliefs, and participation in PA.

P1.160

THE ASSOCIATION BETWEEN HOME PHYSICAL ENVIRONMENT AND ADOLESCENT PHYSICAL ACTIVITY

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Introduction and Objective: Research on the environment and physical activity (PA) has seen noticeable growth in the past decade. Nevertheless, while the importance of the neighborhood environment on PA have been clearly demonstrated, some researchers have suggested that understanding the effects of home environment, where youth spend significant time, also deserves attention. The purpose of this study was to examine the associations between the home physical activity and media equipment (ME) and adolescents PA.

Methods: Data were obtained from 579 adolescents (295 girls) aged 12 to 18 from Madrid, Spain. Participants completed the Finnish Physical Activity Index (FPAI), the Physical Activity Questionnaire for Adolescents (PAQ-A) and the PACE questionnaire. Two self-reported scales were used to assess the ME in adolescents' home and bedroom. Physical activity equipment in home was evaluated by three self-reported scales related to the number of sport facilities, PA equipment and PA materials in home. A composite score for PA facilitators (PAF) were computed. The home environment was classified into four categories: "*Technological environment (TE)*" (high ME/low PAF), "*Devoid environment (DE)*" (low ME/low PAF), "*Sport environment (SE)*" (low ME/high PAF) and "*Cumulative environment (CE)*" (high ME/high PAF).

The associations of home physical activity facilitators with adolescents' PA were analyzed by linear regression and differences in PA based on the home environment category was tested by 1-way ANCOVA (controlling by potential confounders).

Results: PA facilities, equipment and materials were positively associated with all PA level indicators (all $p < 0.001$). Similarly, PAF score was positively associated with PAQ-A ($\beta = 0.247$), FPAI ($\beta = 0.248$) and PACE ($\beta = 0.237$) scores (all $p < 0.001$). Adolescents who live in a "*SE*" obtained higher scores in all PA indicators compared with participants who live in a "*DE*" (ranging from 0.269 to 0.591; all $p < 0.05$) or "*TE*" (ranging from 0.270 to 0.580; all $p < 0.05$). Furthermore, participants living in a "*CE*" showed higher levels of PA matched with adolescents from "*DE*" (ranging 0.292-0.650; all $p < 0.01$) or "*TE*" (ranging from 0.292 to 0.633; all $p < 0.01$).

Conclusions: PA facilitators available in the immediate environment could significantly influence on the level of PA among adolescents, regardless of the home ME.

P1.161

Differential effect on objective physical activity during recess in a comprehensive school intervention

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

The primary aim is to evaluate differential intervention effect across students with different characteristics e.g. gender, age and baseline recess activity. Furthermore, the intervention effect will be analysed for possible implementations moderators i.e. perceived possibilities for physical activities in the school environment.

Methods:

The Danish SPACE-study used a cluster randomized controlled study design with a 2-year follow-up, and enrolled 1348 students aged 11-13 years from 14 schools. A web-based questionnaire was used to obtain knowledge of PA during recess and accelerometry was used for objective measurement of physical activity. The multicomponent intervention comprised 11 components, and included a combination of substantial changes to the physical environment and supporting organizational changes.

Results/findings:

Overall the intervention resulted in a non-significant effect of physical activity during recess on 65 mean count per minute (MCPM). The average MCPM for all participant at follow-up was 685. Gender and age significantly moderate the intervention effect as the effect for boys were significant at 117 MCPM and non-significant for girls at only 16 MCPM. The oldest students had an intervention effect on 151 MCPM, compared to 41 MCPM and 32 MCPM for the younger students. Having access to unfixed equipment and more outdoor opportunities for recess physical activity was associated with additional intervention effect.

Conclusions:

The Space project induced large changes to the school outdoor environment and to the organizational environment. The objective measures of recess physical activity revealed a tendency towards a positive intervention effect on approximately 10% with great variation across schools, which might be explained by differences in implementation.

The current intervention seems to have been effect full for boys but not the girls, and interestingly, levelled off the steep decline in physical activity for the oldest students approximately 15 years old. Future recess programs and outdoors improvement need to better understand what works for whom under which circumstances and explicitly target school environments for girls.

P1.162

Relationship between self-reported MVPA and pedometer-assessed daily step counts - validation study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Only few studies have examined the validity of the moderate-to-vigorous physical activity (MVPA) item used in the Health Behaviour in the School-aged Children (HBSC) study. The aim of the current study was to evaluate the consistency between two measures of MVPA and to assess whether 11 to 15-year-old adolescents who achieved 60 minutes of MVPA daily also reach the recommendation of 12,000 daily step counts.

Methods: Self-reported MVPA (60 minutes of MVPA in 7 days per week) and step counts using the Yamax Digiwalker SW-200 pedometer were measured in a total sample of 223 adolescents (11-15 years old; 57% girls). Correlations between pedometer-derived MVPA/day and self-reported MVPA days/week for the whole sample, gender and weight status were computed by Spearman's Rho. Agreement between the two measures (i.e. meeting or not meeting the 60 minutes of MVPA in 7 days per week, 12,000 step counts daily) was determined using percent (raw) agreement, sensitivity and specificity.

Results: Large correlations ($Rho > 0.5$) between self-reported MVPA and step counts were found in the overall sample as well as in subgroups of gender and weight status. Higher correlation coefficients were found in boys (0.56) and overweight individuals (0.54). The agreement between pedometer-based data and self-report questionnaire was 61.9% (59.7% in boys; 63.3% in girls). The overall specificity was 91.9% and ranged between 88.1% in girls to 95.8% in boys, the overall sensitivity was 41.5% (36.8% in boys; 44.6% in girls).

Conclusions: Compared with pedometers, the MVPA self-report questionnaire appears to have good validity for determining adolescents' achievement of physical activity recommendations. These findings indicate that the MVPA question used in HBSC and other studies is an appropriate instrument for classifying adolescents in terms PA of recommendations.

P1.163

Implementation of an Intergenerational Physical Activity Leadership Intervention

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Objective: Intergenerational programs can benefit physical and mental health, reduce social exclusion for older adults (OA) and increase personal and social development, and academic performance for children. Physical activity (PA) has been identified as a novel approach to intergenerational programming that may offer even greater benefits than traditional PA programming. Few studies have tested this approach and as such the aim of this study was to determine the feasibility of a school-based Intergenerational Physical Activity Leadership intervention (IPAL).

Methods: The study sample included 22 grade 4/5 student leaders average 9.86 years old ($SD=2.13$) and nine OA participants average 72.35 years old ($SD=5.52$). The intervention included an OA led playground games leadership workshop, child led PA, a joint marathon tracking activity and an OA led PA fair. Baseline and follow-up impact evaluation included: questionnaires measuring PA leadership confidence and intergenerational attitudes, observations of school playground PA and context using the System for Observing Play and Leisure Activity in Youth (SOPLAY) and interactions between generations using the Intergenerational Observational Scale (IOS). Process evaluation included post training satisfaction surveys and focus groups to identify implementation benefits, facilitators and barriers. Paired samples t-tests compared knowledge and confidence pre and post program. Repeated measures ANOVA and post-hoc t-tests compared MVPA and playground environment before, during and after IPAL. Frequency and distribution of observed affect and percentage of time in intergenerational, or peer activities described intergenerational interactions. Qualitative data analysis consisted of a framework analysis to identify themes.

Results: Post workshop, both groups had high levels of satisfaction, leadership confidence and intention to use what they learned. Observations showed significantly more organized activities $t(48)=-8.030, p<0.001$ and equipment on the playground $t(48)=-9.128, p<0.001$ after training and both age groups displayed mostly positive affect during intergenerational interactions. Focus group themes highlighted learning, relationship building and rewarding experiences, challenges included communication, difficulties with leadership and waning enthusiasm while enthusiasm and energy facilitated implementation.

Conclusions: An intergenerational PA leadership intervention is feasible, has potential for facilitating PA and intergenerational interaction, and may offer social and physical benefits to participants. Larger scale experimental studies and more measurement tools are needed.

P1.164

Two 'Teams' in the Highland Dancing Class: Factors Impacting on Motivation to Participate

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Royal Conservatoire of Scotland, Glasgow, UK

SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Highland dancing is practiced by over fifty thousand people world-wide (Scott, 2005), yet 'there are barely enough coherent ethnographic threads to weave a garment of identity, let alone a colourful and vibrant tartan that would better represent the nature of the culture' (Scott, 2005, p.22). This study contributes to the limited body of work through interrogating the factors that influence the motivations of Highland dancers (aged under 30) in one class in Glasgow, Scotland, to support or withdraw from participating in the activity.

Methods:

Data was collected through semi-standardised and expert interviews (Flick, 2002) with the class teacher and four participants and through conducting participant observations sessions and dancing in the classes observed. Following the creation of a grounded coding frame for thematic analysis, data was situated within Erving Goffman's (1959) model of dramaturgy to explore the cultural, social and physical 'realities' in the Highland dancing class.

Results/Findings:

The key finding relates to the existence of two 'teams'. The teacher and older participants protected the dominant 'reality' characterised by standardisation of dance performance and physicality, supporting the notion that validity in Highland dancing was derived from regulation. Factors impacting upon the behaviours and opinions of this 'team' revolved around their perceptions of an existing lack of understanding of Highland dancing 'outside' the practice, encompassing the difficulty and history of the dance form and associations with a derogatory 'Scottishness'. A 'team' of younger participants rebelled against the physicality and lack of creativity inherent to the dance practice in the examination and competition arena which necessitated a disciplinary learning environment.

Conclusion:

This study reveals a need to explore the potential negative impact on the popularity of Highland dancing in Scotland, through drawing attention to the focus on the physicality of the practice, to the detriment of creative and cultural experiences.

References:

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P1.165

Absentee rates in physical education at high schools: the importance of gender and branch of study

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose:

Absenteeism in high school is a major concern, and research about absenteeism in physical education in relation to gender and type of branch is sparse. This study aimed to investigate the impact of gender upon absentee rates in physical education (PE) among high school students in different branches of study.

Methods:

Absentee rates in PE among all students in Nordland county (N = 6928) in Norway were collected. The data included gender and type of branch (specialization in general studies; vocational subjects not dominated by females; vocational subjects dominated by females). The Kruskal-Wallis test checked for differences in absentee rates between the three branches. The Mann-Whitney *U* test was performed to identify the pairwise differences between branches and genders.

Results/findings:

Absentee rate in PE differed between the three branches ($\chi^2_2 = 125$, $p < 0.001$): lowest in specialization in general studies (Mean = 9.6%, SD = 10.9%), and highest in vocational subjects dominated by females (Mean = 16.0%, SD = 16.4%). Girls (Mean = 12.3%, SD = 13.8%) had higher absentee rates than boys (Mean = 10.9%, SD = 13.7%) ($Z = -6.1$, $p < 0.001$). There was no significant gender difference in absentee rates in the branch of specialization in general studies. Female students had significant higher absentee rates than males at vocational subjects not dominated by females ($Z = -5.2$, $p < 0.001$), while there was no significant gender difference in absentee rates at vocational subjects dominated by females.

Conclusions:

The findings show that absentee rates in PE varies between different branches, and this knowledge is important to be aware of as teachers. Gender also seems to be important. The results indicate that students at vocational subjects dominated by girls may be less motivated for PE. To prevent high absentee rates, it is important that PE teachers find ways to motivate their students. The findings indicate that this is especially important for the students in vocational subjects dominated by females, and for girls in vocational subjects.

P1.167

Is there evidence that walking groups have health benefits? A systematic review and meta-analysis

Sarah Hanson, Andy Jones
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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

To assess the health benefits of outdoor walking groups.

Methods:

Systematic review and meta-analysis of adult outdoor walking group interventions. Evaluation of the differences between baseline and intervention end in commonly used physiological, psychological and well-being outcomes. Seven electronic databases, clinical trial registers, grey literature, and reference lists in English language up to November 2013 searched.

Results:

Forty-two studies were identified involving 1,843 participants. There is was evidence that walking groups have wide-ranging health benefits. Meta-analysis showed statistically significant reductions in mean difference for systolic blood pressure -3.72mmHg (-5.28 to -2.17) and diastolic blood pressure -3.14mmHg (-4.15 to -2.13); resting heart rate -2.88bpm (-4.13 to -1.64); body fat -1.31% (-2.10 to -0.52), body mass index -0.71kg/m² (-1.19 to -0.23), total cholesterol -0.11mmol/L (-0.22 to -0.01) and statistically significant mean increases in VO₂ max of 2.66 ml/kg/min (1.67 to 3.65), the SF-36 (physical functioning) score 6.02 (0.51 to 11.53) and a 6 minute walk time of 79.6 metres (53.37, 105.84). A standardised mean difference showed a reduction in depression scores with an effect size of -0.67 (-0.97 to -0.38). The evidence was equivocal for other outcomes such as waist circumference fasting glucose, SF36 (mental health) and serum lipids such as HDL. No notable adverse side effects were reported in any of the studies.

Conclusions:

Findings suggest outdoor walking groups are effective. They have wide ranging health benefits including reducing blood pressure, body fat, total cholesterol and risk of depression. They appear to be an acceptable intervention to participants, with high levels of adherence and few adverse effects. They could be a promising intervention as an adjunct to other healthcare or as a proactive health-promoting activity. These findings provide clinicians with evidence of a further effective option to recommend to those patients who would benefit from increasing moderate physical activity.

P1.168

CAN CONFIDENCE PREDICT FITNESS IMPROVEMENTS FROM CROSSFIT?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Individuals may feel discouraged when they do not see significant improvements after starting a workout program. Among novices, higher self-confidence has been associated with fitness improvements, while the opposite is true for those with greater experience. This study examines differences in fitness improvements by level of self-confidence in both novice and non-novice adults participating in CrossFit, a high-intensity group-exercise program. Understanding this interaction may encourage adherence.

Methods:

Individuals who regularly participated in CrossFit were recruited from a university setting (n=50; 43% male, ages 18-66, 96% white, all had at least some college education). At baseline, participants rated their confidence to participate in a sport requiring resistance, balance, and agility on a scale from 1 "not at all confident" to 10 "completely confident." Then they completed a corresponding objective fitness test (one rep max back squat, agility hop test for balance, pro-agility test) at baseline and two months. At baseline, participants were categorized as novice or non-novice (< 6mo or > 6mo of CrossFit participation), and low-moderate or high confidence (<7 or 8-10 confidence score). Five participants (all white females) reported injuries (e.g. back pain, ankle concerns) at 2-months that affected their fitness tests and were not included. Data were analyzed with SPSS 21.

Results:

For the novice population, those with high confidence to participate in a sport requiring resistance had significantly greater back squat improvements than those with low-moderate confidence (18-lb vs. 8-lb, t=2.3, p=0.048); while participants with low-moderate confidence to participate in a sport requiring balance had significantly fewer mistakes on the agility hop test than those with high confidence (-2.25 vs. -0.17, t=2.6, p=0.021); no significant differences were found for agility. Self-confidence was not significantly related to fitness improvements for the non-novice population.

Conclusions:

The relationship between self-confidence and fitness improvements is complex, showing different patterns for different aspects of fitness. Those new to CrossFit with higher confidence had greater strength improvements, while those with lower confidence had greater balance improvements. Non-novice fitness improvements were not related to self-confidence. Efforts to increase novice CrossFit participants' confidence on resistance exercises may facilitate greater improvements, thereby leading to adherence.

P1.169

Why might adults belong to outdoor walking groups? A qualitative study using photo-elicitation methods in a population with poor health physical activity indicators

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purposes: To explore why people belong to walking groups as opposed to walking alone. To contribute to the evidence on walking in a group format as a public health intervention. To inform the way group walking is promoted.

Method: Participants were recruited from a health walk group. Using disposable cameras, participants generated 15-20 photographs. Simple instructions were given to photograph barriers to walking in everyday life and also everyday walking that was pleasurable. They were also requested to photograph both positive and negative features of walking within a walking group. Photographs were used as the basis of a semi-structured interview to explore the differences between walking alone and walking in a group as well as the perceived benefits of joining a walking group.

Results: Participants generated multiple images of barriers to walking in everyday life and of walking that they enjoyed. Breathlessness was a common feature and photographs were used to demonstrate this. Whilst photographs showed the walking group, participants actually valued having time to walk alone and did not need feel the need of a walking partner. Participants expressed that they had not previously thought of walking as a form of exercise and were surprised at the intensity and speed in a group walk. Examples were given of how increased walking ability was translated into everyday walking. Participants took care to take and organise photographs and these revealed insights into everyday life that may not have been achieved with only an interview. They stated they valued this method and found it a useful trigger to think about physical activity.

Conclusions: Walking in a group was valued by participants but not necessarily for the social aspect that might be assumed. Therefore promoting group walks as a social activity could be counter-productive to those who want the encouragement and presence of others but would feel inhibited by an obligation to group involvement. It may be better to promote group walking as a form of supported exercise and give examples of the type of health benefits that could be achieved, such as improved walking speeds and reducing breathlessness.

P1.170

Accelerometer-Based Physical Activity in School Aged Children across One Week: A Cross-Sectional Analysis from CCLaS Study

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University College Cork, cork, Ireland

SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose:

Little is known about the Physical Activity (PA) levels and patterns of school-aged children in Ireland. The aims of this study were to describe PA profiles throughout one week using accelerometers.

Methods:

Accelerometer data over one week was collected from 1075 children in 27 schools. Overall, 830 children (56.3% boys) were included in this study. Minute by minute threshold values were used to define four physical activity groups: sedentary, light, moderate and vigorous. Smoothed curves were used to display minute by minute variation in average activity levels. Latent profile analysis was conducted to identify latent PA classes. Multinomial logistic regression was then used to identify variables associated with class membership.

Results:

School-aged children's PA level varied by age, gender, BMI level, school location, and investigation time. Boys were more likely to spend more time in MVPA than girls, normal weight children were, on average more active than overweight and obese children. Children in longer day length days were more active than those in shorter day length days. The number of days meet the daily MVPA requirement among boys was 1.22 (95% confidence interval (CI) 1.14-1.30) times more than girls; normal weight children was 1.28 (95%CI= 1.18-1.38) times more than overweight and obese children; when day length was longer by one hour, children tended to increase the number of days meet 60 minutes MVPA by 1.03 (95%CI=1.02-1.04) times; children living in urban area have more days meet the requirement than in rural area at about 1.22 (95%CI= 1.08-1.38) times.

Conclusions:

Activity levels differed by demographic and temporal factors. There was a clear variation in average PA levels during school hours. Accelerometers have the potential to identify subgroups with different profiles based on the distribution of activity levels throughout the day.

P1.171

A Modified Two Method Measurement procedure with a new physical activity questionnaire: More valid PA measurement for large-scale studies with adolescents

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: We use the modified Two Method Measurement (TMM) strategy described recently for physical activity (PA) studies using self-reports (SR) and accelerometers (ACC). We examine several correlations with PA. We present valid correlations, and demonstrate the usefulness of a new 18-item PA questionnaire (PAQ) and a 6-item version applicable in large scale studies.

Methods: We present results from 438 7-8th graders in an eastern US city. ACCs were handed out to a 50% random sample one week before the survey. The survey asked 18 questions about walking, running, and other PA over seven time periods in the previous week. Students also completed a 6-item PAQ. Other questions included gender, BMI, and PA relevant beliefs and behaviors.

The SEM-based TMM model improves measurement validity, drawing strength from two kinds of measures of the construct. The TMM model works when one measure is a gold-standard. Because ACCs are often not a gold standard, we developed the modified TMM procedure; we identify a subgroup (usually half) for whom the ACC is plausibly a gold standard. In this ("good corr") subgroup, we find SRPA-ACC correlations of $r = .60$ or higher. We then employ the regular TMM model with ACC set to missing in the "bad corr" group. All models were tested in Mplus.

Results: We present correlations involving data from the 18- and 6-item PAQs: Model 1 (PA as SR only); Model 2 (PA as ACC only); Model 3 (TMM with all available data); Model 4 (TMM with all cases, but ACC data in "bad corr" group set to missing). Correlations from Model 1 were too high; those from Models 2 and 3 were too low. Correlations from Model 4 fell between the extremes. The results show clearly that correlations from Model 4 are most plausible (valid). We found similar patterns with 18- and 6-item PAQs.

Conclusions: The modified TMM method provides plausible estimates of correlations involving PA. We showed this in a different population and with different SR and ACC measures than previously used. We also demonstrate the value of our 6-item PAQ for large-scale studies.

P1.173

Using a Time Varying Effects Model to examine the dynamic relationship between self-efficacy and physical activity among endometrial cancer survivors across time

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Early Career Award

Objective: Physical activity has been shown to decrease cancer risk and improve quality of life among cancer survivors. Endometrial cancer survivors are often more susceptible to cardiovascular disease following treatment than other types of cancer survivors and therefore may significantly benefit from physical activity (PA) interventions that reduce their risk.

Methods: A sample of 100 endometrial cancer survivors received a 6 month Social Cognitive Theory-based PA intervention with the goal of achieving 150 minutes of moderate intensity activity a week. At two month intervals, starting at baseline, they completed 10 days of ecological momentary assessment for several Social Cognitive Theory constructs, including self-efficacy (one's belief in one's ability to engage in a targeted behaviors), as well as PA. Ecological momentary assessment involved completing several different self-report measures via an electronic handheld device each day, for 10 days. With 100 participants and 42 days of ecological momentary assessments, there were at total of 4,200 possible data points. A Time Varying Effects Model was used capitalize on the richness of the data and examine how the relationship between self-efficacy and PA changed over time. This model was developed specifically for ecological momentary assessment data and uses a semi-parametric approach to model dynamic changes over time.

Results: Participants were mainly White (71%) with a mean age of 57 years, a mean BMI of 34, and were on average, 2 years since diagnosis. Results from this analysis show that the relationship between self-efficacy and PA is non-linear with self-efficacy being a non-significant predictor of PA until half way through the intervention when it positively predicted PA. At the end of the intervention self-efficacy becomes a non-significant predictor of PA.

Conclusions: These results suggest that within this sample, the relationship between self-efficacy and PA is temporally dynamic and that interventions targeting self-efficacy may not see its effects until several months after intervention initiation. The results highlight the importance of measuring psychological constructs during optimal time points in order to capture the true relationship between variables.

P1.174

The effect of weather variations on patterns of moderate-to-vigorous physical activity in youth

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: This longitudinal study examined if variation in weather across the year could explain variability in relative time spent in moderate-to-vigorous physical activity (%MVPA).

Methods: A sample of 76 participants (48 boys) aged 7 to 18 years each wore two accelerometers (Actigraph GT3X+ and Sensewear Mini Armband) for a full week in each of the three seasons (Spring, Summer, and Fall). Daily activity estimates recorded by the two monitors were temporally matched with weather records obtained from a commercial weather company (Weather Underground). The effect of weather on %MVPA was determined using mixed regression models and restricted maximum likelihood estimation. Daily %MVPA obtained from the two monitors was regressed on average humidity, temperature, speed of wind, and precipitation, while controlling for age, sex, height, weight, and school attendance. The consistency of the effects was examined by performing direct comparisons between the two activity monitors. Least square means were computed for different combinations of weather parameters to replicate a Spring, Summer, and Fall day.

Results: There were clear variations on weather across measurement days. Average temperature and humidity ranged from 4 to 26 degrees Celsius, and from 29% to 97%, respectively, while average wind speed and precipitation ranged from 3 to 35 km/hour and 0 to 76.5 mm. Of the various weather parameters, humidity ($p < .001$), and the combination of wind speed and precipitation ($p = .048$) were negatively associated with %MVPA. The negative impact of humidity was attenuated by wind speed ($p = .03$). The GT3X+ yielded significantly higher estimates of %MVPA than the SWA Mini by +9.7% ($p < .001$); however, the impact of weather was consistent between the monitors. The combination of weather parameters resulted in lower activity levels in the summer and adjusted SWA estimates of %MVPA of 20.0%, 16.5%, and 19.2%, and GT3X+ estimates of 28.2%, 26.0, and 28.8%, for spring, summer, and fall days, respectively.

Conclusions: The findings indicate that levels of MVPA in youth substantially vary depending upon weather characteristics. Youth are likely to be less physically active (i.e. low MVPA levels) when the weather is harsh (i.e. humid, rainy and/or windy).

P1.175

The role of urban dwelling type on longitudinal change in cardio-respiratory fitness in English adolescents

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: To model longitudinal change in cardiorespiratory fitness test performance during adolescence, and to assess whether living in an urban setting - which may offer more opportunity for physical activity - affects shuttle run test performance over time.

Methods: We drew data from the longitudinal arm of the East of England Healthy Hearts study ($n=1,580$). Students attending 10 public schools were assessed at baseline when in grade 7 (12 ± 0.1 yrs; 54% male; 2007/2008) and at two-year intervals (grade 9, grade 11; season-matched). Cardiorespiratory fitness was assessed by 20m shuttle run test performance in the school gym. Urban rural dwelling type was assigned according to students' home postal code. We used MPlus to estimate a linear growth model for cardiorespiratory fitness, using number of laps completed as the outcome.

Results: Shuttle run test performance was 34.6 laps at baseline, and rate of change per 2-yr period was an increase of 4.9 shuttles. Our preliminary analyses found that living in an urban setting (compared with suburban and rural) was borderline significantly related to rate of change in shuttle run test performance (1.37 , $p=0.067$), but not on shuttle run test performance at baseline ($p=0.777$). Shuttle run test performance at baseline had no significant effect on rate of change in performance over time ($p=0.145$).

Conclusions: These preliminary findings suggest that urban dwelling type may be favourably related to longitudinal changes in fitness in English youth. Future research is needed to understand underlying mechanisms.

P1.176

Implementation of a web-based community wide physical activity challenge: UWALK Alberta.

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Objective:

UWALK Alberta is a multi-strategy provincial physical activity promotion project centered on a publically available physical activity website. A key strategy of the project is to develop partnerships with community organisations. The current study provides an overview of the implementation and initial evaluation of a community-based physical activity challenge developed in partnership between UWALK Alberta and a community group of primary care providers.

Methods:

A pre-post study design was used. Participants were recruited by primary care providers and UWALK throughout Edmonton, Alberta. The intervention involved an 8-week web-based physical activity challenge.

Participants were challenged to achieve a pre-defined step based physical activity target during the 8-week challenge. The target was 467,501 steps, which equates to achieving an average of 8,000 steps per day over 8 weeks. The challenge was delivered as a virtual walk where participants could track progress through recording their 'steps' on the UWALK website (www.uwalk.ca). The website and challenge included interactive elements such as, virtual maps, leaderboards, progress charts, virtual badges and social networking.

Web-based questionnaires were used to collect participant demographics, physical activity knowledge, health related quality of life and physical activity levels at baseline, post intervention and 6 months. Additionally, challenge and website satisfaction questions were collected post intervention.

Results:

Six of the nine primary care providers partnered with UWALK to implement the physical activity challenge. 549 participants enrolled in the intervention, the majority of participants were female (80.9%). 35.2% of the participants completed the web-based challenge. Post-intervention and retention questionnaires were completed by 121 (22%) and 87 (15.8%) participants respectively. Only 10% (55) of the participants completed all three questionnaires.

Overall, participants rated the challenge favourably, indicated they would participate in future challenges and believed they increased their physical activity due to participation in the challenge.

Conclusion:

This physical activity challenge was a collaboration between a pre-existing provincial physical activity project (UWALK) and a community group. Although, the challenge received positive feedback, the limited number of participants completing the intervention and follow-up questionnaires is disconcerting. An overview of the lessons learnt from working with partners and future directions will be discussed.

P1.177

Older Adults' Outdoor Walking and the Built Environment: Does Income Matter?

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: To examine the association between Street Smart Walk Score® and self-reported outdoor walking among a large representative sample of older Canadians, and to determine whether household income modifies this relation.

Methods: We linked objective Walk Score data with cross-sectional survey data from the Canadian Community Health Survey Healthy-Aging 2008-2009 Cycle for a sample of 1,309 British Columbians aged ≥ 65 years. We examined associations between continuous and categorical Walk Scores, and meeting physical activity guidelines (≥150 minutes of moderate to vigorous activity/week) through self-reported outdoor walking, and tested for significant interactions with household income using multivariable logistic regression.

Results: A ten point higher Street Smart Walk Score was associated with a 17% higher odds of meeting physical activity recommendations through walking outside ($p=0.0003$). In addition, older adults living in neighbourhoods categorised as Walker's Paradise were over three times more likely to meet recommendations than those living in Car-dependent/Very car dependent neighbourhoods. We found no evidence that household income moderated the effect of Walk Score on walking outside.

Conclusions: Neighbourhood walkability may be an important determinant of outdoor walking among older adults. Whether income is a moderator of this relationship requires more investigation.

P1.178

Using Two Method Measurement to Improve the Validity of Physical Activity Measurement and Reassess the Intention-Behavior Gap

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: This study aims to illustrate the utility of the Two Method Measurement (TMM) model as a means of reducing self-report bias in physical activity (PA) measurement ultimately demonstrating the implications for the often studied intention-behavior gap.

Methods: We present results from a sample of 128 upper-level undergraduate students in the United States with two weeks of daily IPAQ and accelerometer (ACC) data. All other measures (e.g. BMI, outcome expectations, intentions) tested for an association with PA were measured prior to the two weeks of PA data collection.

The TMM model is a structural equation model that improves confidence in the validity of the measurement of one construct by drawing strength from two forms of measurement of the same construct. The model works best when one measure is the gold-standard measure of a construct. Unfortunately, ACCs are not a gold standard, thus self-reported PA-ACC correlations are typically low and the standard TMM model is not the correct model.

We present a modified TMM strategy for analyzing PA data. We identify half the participants for whom the self-reported PA-ACC correlation is high, and for whom the standard TMM model is the correct model. The logic is that when the correlation between two measures is high we infer both measures measure the same construct. All data for the group with a high self-reported PA-ACC correlation are used with the standard TMM model; ACC data are set to missing for the other participants. All models are tested in Mplus.

Results: We show across an array of variables that using only one measure of PA yields significant bias, and that the TMM strategy produces more reasonable results. Given the consistently more reasonable results from the TMM strategy, we are able to examine the intention-behavior gap and determine with confidence that in this sample, there is substantial bias in the correlation leading to a larger (and non-significant) gap than would be determined by using only one measure alone.

Conclusions: Our method offers PA researchers a valuable and accessible approach to measuring PA, testing correlates and outcomes of PA, as well as evaluating PA interventions.

P1.179

Objectively measured physical activity of adolescents in the Czech Republic

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SIG: Yes, Policies and environments

Awards: No

Purpose:

Physical activity is one of the preventive factors in unhealthy lifestyle habits. Increasing prevalence of obesity and unhealthy health behavior are typical indicators in Czech adolescents. Therefore the aim of this study was to find out whether Czech adolescents meet the recommended level of physical activity on national level. Further aim was the improvement in estimates of associations between neighborhood and health behavior.

Methods:

Standardized method using the IPEN adolescent protocol was used to get the subjective and objective measures on physical activity and neighborhood environments in eight Czech regional cities (Brno, České Budějovice, Hradec Králové, Liberec, Olomouc, Ostrava, Plzeň and Ústí nad Labem). The research is running from 2014 to 2016. After first phase of the project (2014) total of 785 adolescent respondents participated in the study. Preliminary results include only sample of 69 respondents' objective measures of physical activity observed by pedometer Yamax SW700.

Results/findings:

Only 38 % of Czech adolescents meet the recommended level of at least 10000 steps/day and only 18 % the level of 12500 steps/day. They were more likely to meet the recommended level of steps during working days (average 9885 steps/day for boys and 8668 steps/day for girls) than during weekends (average 7797 steps/day for boys and 6868 steps/day for girls).

Conclusions:

Based on other research it is alarming that the level of physical activity in adolescents in Czech Republic is decreasing. Preliminary results of objective measures indicate that the Czech society is still not well prepared to deal with epidemics of obesity and unhealthy lifestyle in youths. It is possible that the various environments influence the level of physical activity in adolescents and the policy should reflect these indicators in creation more physical activity friendly and safe environments.

Keywords: IPEN adolescent, accelerometer, school environment Supported by the research project of Czech Scientific Foundation "Multifactorial research of built environment, active lifestyle and physical fitness of Czech youth" (No. 14-26896S) and by the research project of NHLBI "IPEN Adolescent: International Study of Built Environments and Physical Activity" (R01 HL111378).

P1.180

Independent and interactive associations between neighborhood environment, behavioral correlates and adult physical activity.

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SIG: Yes, Policies and environments

Awards: No

Background: Neighborhood studies report positive relationships between built and social environment and activity, but from a behavior change perspective, how neighborhood influences psychosocial correlates can better inform context based interventions. This study examines: 1) the association between neighborhood and behavioral psychosocial correlates on moderate intensity physical activity (MVPA) and walking in US adults and; 2) the neighborhood as a potential moderator of the relationship between psychosocial correlates and behavior.

Methods: Parents from the NCI Family, Life, Activity, Sun, Health and Eating Study provided data for this study. Behavioral correlates include: barriers, attitudes, motivation, and self efficacy; neighborhood variables include: built food and activity environment, social capital, and safety. Models examined the independent association of these variables on walking and MVPA, controlling for demographics. Final models examined the interactions between neighborhood and behavioral correlates.

Results: 1702 parents provided FLASHE data (M age = 43.88, 75.12% female, 48.26% college graduates), while 1527 and 1354 parents, respectively, provided data for MVPA and walking. Overall F-tests for each of the four models examining neighborhood and psychosocial correlates of moderate intensity PA and walking were significant ($F_s \geq 2.41$, $p_s \leq .003$). In the neighborhood models, greater social capital was associated with marginally greater MVPA ($p = .06$); however, no neighborhood variables were significantly associated with walking ($p_s \geq .38$). In the psychosocial models, significant correlates of greater MVPA included: fewer barriers ($p = .01$) and greater autonomous motivation ($p = .04$). Attitudes toward physical activity were the only significant psychosocial correlate of walking ($p = .04$). Analyses found an interaction between social capital and autonomous motivation ($p = .005$), such that the association between autonomous motivation and MVPA was stronger at higher levels of social capital.

Conclusion: As a cross sectional examination of adults across the US, it was not possible to determine if social capital promoted autonomous motivation, or vice versa, to influence adult PA behaviors. However, findings do highlight a potential hypothesis for the important role of neighborhood social capital (networks of relationships, trust and reciprocity,) as a potential mechanism by which it can influence MVPA, through autonomous motivation.

P1.181

ACTIVE TRAVEL TO SCHOOL IN CURITIBA - BRAZIL: ACCESSIBILITY FACTORS AND DISTANCE MEASURED BY GIS

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: To determine the association between the travel distance to school from home and cyclists and pedestrians accessibility to schools with active transportation in adolescents.

Methods: This cross-sectional study was conducted in Curitiba-Brazil as part of the IPEN project. The data were drawn from surveys conducted between 2013 and 2014. The analytic sample included 493 adolescents (51.4% girls) and also the schools where attendance was reported ($n = 124$, 72.6% public). This analysis was conducted using individual variables (age, sex and socioeconomic status) and active transportation patterns (frequency and duration that the adolescents had walking, cycling and skateboarding to and from school, categorized as non-active [0 min/week] and active [≥ 1 min/week]). Accessibility was assessed through a school environment audit tool. Travel distance from home to school was estimated considering the shortest route considering the road network and using ArcGIS 10.0. Associations were tested through Poisson regressions in STATA 11.0 software, with a significance level of 5%.

Results/findings: In the adjusted analysis, association was found between active transportation and the presence of cycle lanes (RP: 0.50; IC95%:0.32-0.77; $p=0.002$), presence of sidewalks (RP: 2.55; IC95%:2.17-3.00; $p<0.001$) and travel distance of 1501 - 3500m (RP: 0.50; IC95%:0.38-0.67; $p<0.001$) and ≥ 3501 m (RP: 0.26; IC95%:0.16-0.40; $p<0.001$).

Conclusions: Few accessibility factors are associated with active transportation. Smallest distances to school, presence of sidewalks and cycle lanes stimulates adolescents to walking, cycling or skating.

P1.182

Training Physicians to Counsel for Physical Activity in México

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SIG: No, this does not fit in any of the special interest groups

Awards: No

Purpose: The proportion of Mexican physicians implementing physical activity (PA) counselling practices (i.e. verbal advice, written prescription and referral) is low, ranging from 6% for writing prescriptions, 8% for referring patients to community resources to 33% for providing verbal advice. Recognizing the importance of PA counselling in primary care, the Jalisco Secretary of Health introduced a PA counselling training course for physicians in 2012. The purpose of this study was to evaluate the Reach, Effectiveness, Adoption, Implementation and Maintenance of a PA counselling training course for Mexican physicians. A three-hour, evidence-based PA counselling training course framed on the theory of planned behaviour (TPB) was implemented by the Secretary of Health across the 13 sanitary regions in the state of Jalisco, Mexico.

Methods: The RE-AIM framework guided this evaluation. For Reach and Effectiveness, 305 consenting primary care physicians (52% women) completed a questionnaire gathering demographic information and measuring their PA counselling practices, the tenets of the TPB, their PA knowledge (of PA intensities, FITT principles, and international PA guidelines), and their PA behaviour. Adoption and Implementation of the training strategy were measured via structured telephone interviews with regional coordinators and training site observations. Maintenance was assessed by determining the long term training effects and the sustainability of the strategy.

Results: After the training, there was a significant increase in the proportion of physicians reporting that they know the different PA intensities (16% vs. 92%, $p < .001$), the FITT principle (8% vs. 88%, $p < .001$) and PA guidelines (4% vs. 77%, $p < .001$). Significant improvements on physician PA counselling were observed after three to six months ($p < .001$, $d = .73$). The training was adopted by all (100%) sanitary regions in Jalisco and consistently implemented, although with duration variability, costing on average \$429 Mexican pesos (\$33 US) per session. At evaluation time, institutionalization of the PA counselling training course had been achieved because the PA training for physicians was mandated as a component of the state-wide strategy against NCDs.

Conclusions: This training strategy is a low cost, feasible and promising intervention for improving PA counselling practices among Mexican physicians.

P1.184

Physical Inactivity, Sedentary Behavior and Health in the Oil-Producing Countries of the Arabian Peninsula: Evidence to Inform the Prevention of Non-Communicable Diseases

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: Type 2 diabetes, cardiovascular disease and other non-communicable diseases present major public-health challenges for the oil-producing countries of the Arabian Peninsula. We reviewed the available evidence on physical inactivity, sedentary behavior and health, to identify opportunities for behavioural epidemiology research and the potential for preventive initiatives.

Methods: A literature search was conducted in April 2014 with PubMed, Web of Science and Google Scholar. The search was limited to peer-reviewed publications in the English language through April 2014; 66 studies were identified and categorized within the phases of the Behavioral Epidemiology framework.

Results: Of the 66 studies identified, 35 focused on populations in Saudi Arabia and the United Arab Emirates and a majority (38) targeted the adult population. Associations of inactivity with health outcomes (20); prevalence and/or variation of inactivity (23); correlates of inactivity (26); and, interventions (5) were key foci of the studies. Few studies addressed sedentary behavior. Wide variability in definitions and tools made cross-country comparisons difficult.

Conclusions: Levels of physical inactivity and sedentary behaviour are high in the oil-producing countries of the Arabian Peninsula, particularly so for women and for young adults. Considering the available evidence and future evidence needs within a socio-ecological perspective can assist in understanding how most appropriately to reduce inactivity, particularly through environmental and policy initiatives via active transport and urban planning. Opportunities for research on physical activity and sedentary behavior in the region are considered, especially intervention studies.

P1.185

Epidemiology of Physical Activity Among Omani Adults

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: This the first study that presents the descriptive epidemiology of physical activity (PA) among Omani adults at the national level.

Methods: Secondary analysis was carried out using the Oman World Health Survey, a population-based household survey conducted in 2008. Physical activity was measured using the global Physical Activity Questionnaire. Due to gender and age interactions, regression analysis was carried out for gender/age disaggregated cohorts.

Results: A total of 2,977 Omani adults (50% women) had complete information for physical activity and socio-demographic variables. Prevalence of adults meeting physical activity recommendations was 54.9% for men and 40.5% for women and was higher in younger age groups. Regression analysis using gender/age dis-aggregated models identified place of residence, marital and working status as significantly associated with meeting physical activity recommendations. Transport was the most common domain for physical activity; it was higher in men compared to women and higher in the younger age cohorts. A similar trend was seen in the leisure domain but not work. Domain-specific activity was significantly associated with place of residence for most gender/age cohorts.

Conclusions: Varied pattern of physical activity implies that policies need to target women and men and age cohorts differently according to domain of behavior. Given the geographical variation in physical activity, further research is required to guide policy-makers in creating a supportive built environment.

P1.186

Development of an intervention to promote physical activity and/or reduce sedentary behaviour in adolescents girls: the use of a participatory approach.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Adolescent girls have the most unhealthy profile concerning physical activity and sedentary behaviour of all age and gender groups. It is therefore important to develop an intervention targeting these behaviours in this group. However, it has been shown that this group is difficult to reach and is less likely to engage in interventions. Therefore, the aim of this study is to thoroughly involve the adolescent girls during the entire intervention development process.

Methods: A participatory approach will be used in three selected secondary schools to develop a school-specific intervention programme to promote physical activity and/or to reduce sedentary behaviour.

Results: In each of the participating schools, it will be asked which adolescent girls would like to contribute to the intervention development process. These girls will form the working group in each school. Four to five brainstorm sessions will be conducted with the working group during the first months of the school year. The specific topics of each brainstorm session will be provided by the present researcher (for example: which physical activity or sedentary behaviour do you want to change, what are possible strategies to change this behaviour, who do you want to involve to accomplish the behavioural change, ...), but the adolescent girls will mutually discuss this topic. This will lead to an intervention programme that is completely developed by the target group. In the second part of the school year, the selected intervention will be implemented per school.

Conclusions: Involving the adolescent girls during the development of the interventions will increase the chance on effectiveness and sustainability. Moreover, this unique approach of involving the adolescent girls will significantly improve our understanding of success and failure factors of interventions in this group.

P1.187

Validation of a novel pocket-based device to measure and provide feedback on physical activity and sedentary behaviour

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Time spent sitting is a risk factor for a range of cardio-metabolic diseases independent of time spent in physical activity. Thus, interventions to reduce sitting are likely to reduce cardio-metabolic disease risk. The most effective intervention tool for increasing physical activity is the pedometer, which enables individuals to self-monitor their physical activity level, set physical activity targets and provide real-time feedback of progress towards their goal. However no device equivalent to the pedometer is currently available for the self-monitoring of sitting behaviour, so development of a new device is required to address this need. We are developing a novel pocket-based accelerometer, called the sitFIT, which measures both sitting time and physical activity, and has a screen to provide real-time feedback on both sitting behaviour and number of steps taken. The purpose of the present study is to validate the sitFIT device for the measurement of sitting behaviour and physical activity.

Methods: The validation was conducted in two parts. In part 1, 40 participants wore accelerometers in left and right pockets, while sitting, standing and walking at speeds from 1 to 8 km/h on a treadmill. Expired air was collected throughout to measure oxygen uptake (and thus energy expenditure), and participants were videoed to enable direct observation of stepping rate. Vector magnitude accelerations were measured at each intensity and related to walking speed and oxygen uptake. In part 2, 8 participants wore prototype sitFIT devices in their left and right pockets, and activPAL accelerometers on both thighs, for up to 7 days. A novel algorithm to determine sitting, standing and stepping for pocket placement will be developed, and agreement between the pocket and (gold-standard) thigh position for activity behaviours in the free-living setting will be compared.

Results: Initial analysis of the treadmill data shows very strong relationships between vector magnitude accelerations and walking speed/oxygen uptake ($r^2 = >0.96$).

Conclusions: Our preliminary data confirm the viability of the pocket placement for measurement of walking speed and energy expenditure of stepping activities. Further analysis will determine the viability of the pocket position for the measurement of time spent sitting.

P1.188

Short-term influence of revised provincial accreditation standards on physical activity, sedentary behavior, and weight status in Alberta, Canada child care centers

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Purpose: In December, 2013, revised Alberta Child Care Accreditation Standards were released by the Alberta Government in Canada that included a new standard and related indicators for physical activity and sedentary behavior in accredited child care settings. Approximately 90% of licensed child care centers in Alberta, Canada are accredited. The main purpose of this study was to examine the effectiveness of the new accreditation standard in increasing physical activity and reducing sedentary behavior in a sample of children in Alberta, Canada attending child care.

Methods: The study used a pre-post study design and is based on 86 children aged 19-60 months from eight child care centers across Alberta, Canada. Levels of physical activity (light (LPA) and moderate-to vigorous-intensity (MVPA)) and sedentary time during child care were accelerometer-derived at baseline (October/November, 2013) and follow-up after a new accreditation standard and related indicators was implemented (May/June, 2014). Age- and sex-specific body mass index (BMI) z-scores at baseline and follow-up were also calculated.

Results: Changes in physical activity and sedentary time were moderated by age group (toddler: 19-35 months and preschoolers: 36-60 months). Over an average 6.5 month period, a small decrease in sedentary time (3.1 min/hr, $P<0.05$) and a moderate increase in MVPA (1.7 min/hr, $P<0.05$) were observed among toddlers along with a moderate decrease in BMI z-score (0.18 SD, $P<0.05$). However, among preschoolers a small increase in sedentary time (1.9 min/hr, $P<0.05$) and a small decrease in LPA (1.9 min/hr, $P<0.05$) were observed.

Conclusions: The new accreditation standard shows promise for toddlers. Future research with a control group that evaluates the process of implementing the new standard and related indicators at each center is needed to confirm and expand on these findings of this study.

P1.189

The association between physical activity, sitting time, sleep duration and sleep quality as correlates of presenteeism

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Despite higher economic costs for presenteeism (productivity loss while at work due to illness) compared to absenteeism (being not at work because of illness) there is scarce research on the association between lifestyle behaviours and presenteeism. Therefore, this study aimed to examine the relationship of lifestyle behaviours including physical activity, work and non-work sitting time, sleep quality and sleep duration with presenteeism while controlling for socio-demographics, work- and health-related variables.

Methods: Data were collected from 710 workers (aged 20-76 years; 47.9% women) from randomly selected Australian adults who completed an online survey. Presenteeism and lifestyle behaviours were assessed using the following questionnaires: Health and Work Performance Questionnaire (presenteeism), Active Australia Survey (physical activity), Workforce Sitting Questionnaire (sitting), and adapted questions from the Pittsburgh Sleep Quality Index (sleep duration and quality). Linear regression was used to examine the relationship between lifestyle behaviours and presenteeism. Further, an index counting the number of risky lifestyle behaviours participants engage in was included in a linear regression to examine the association of multiple lifestyle behaviours and presenteeism.

Results: Analyses were adjusted for gender, marital status, employment status, occupation, general health and mental health as they were significantly associated with presenteeism ($P < 0.05$). Lower work sitting time ($B = -0.086$; $P < 0.05$), poorer sleep quality ($B = 0.112$; $P < 0.05$) and suboptimal sleep duration ($B = 0.081$; $P < 0.05$) were significantly associated with higher presenteeism when controlling for all lifestyle behaviours. Physical activity ($B = -0.057$; $P = 0.132$) and non-work sitting time ($B = 0.060$; $P = .116$) were not associated with presenteeism when controlling for the mentioned confounders and lifestyle behaviors, however an association was present when only controlling for socio-demographics ($B = -0.100$; $P < 0.01$ and $B = 0.085$; $P < 0.05$ respectively). Further, engaging in three risky lifestyle behaviours was associated with higher presenteeism ($B = 0.150$; $P < 0.01$) compared to engaging in none or one.

Conclusions: The results of this study highlight the importance of behavioural interventions that simultaneously address activity-related behaviours in conjunction with sleep. To reduce presenteeism associated costs employers should consider implementing workplace programs to improve multiple health behaviours including physical activity, sitting time and sleep behaviour in employees. Further, there is a need for better quality measures to clarify the associations between physical activity, sitting time and presenteeism.

P1.190

Association of light exposure on physical activity and sedentary time in young people

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Light exposure is associated with several health outcomes; however, its association with physical activity and sedentary behaviour has not been researched. The aim of this study was to investigate whether light exposure was associated with objectively measured physical activity and sedentary behaviour in young people.

Methods: Participants ($n = 229$, 46.7% female) were young people (mean 8.8 years [$SD \pm 2.2$]) from the borough of Camden, London, UK. Daily sedentary time, moderate and vigorous physical activity (MVPA) and light exposure were measured using a tri-axial accelerometer with an ambient light sensor during the summer. Multiple linear regression models examined associations between average daily light exposure, sedentary time and time in MVPA. Models were repeated investigating weekdays and weekend days separately. Analyses were adjusted for pre-specified covariables, including age, sex, accelerometer wear time, ethnicity, school and body fat. Final analyses also adjusted for time in MVPA and sedentary time in the sedentary and MVPA models, respectively.

Results: There were significant associations between average daily light exposure and time sedentary (β coefficient = -11.2 , 95% CI, -19.0 to -3.4) and in MVPA (β coefficient = 3.5 , 95% CI, 1.2 to 5.9) in the final adjusted models. Light exposure was significantly associated with weekend sedentary time (β coefficient = -10.0 , 95% CI, -17.6 , -2.4), weekend MVPA (β coefficient = 3.7 , 95% CI, 1.7 , 5.7), weekday sedentary time (β coefficient = -15.0 , 95% CI, -22.7 to -7.2), but not weekday MVPA (β coefficient = 2.0 , 95% CI, -0.5 to -4.5) in the final adjusted models.

Conclusion: Average daily light exposure is positively associated with time in MVPA and negatively associated with sedentary time. However, weekday light exposure was not associated with weekday MVPA. Exposure to daylight may be an important predictor of physical activity and sedentary levels in young people.

P1.191

A literature review of questionnaire based methods to assess physical activity and sedentary behavior: questionnaire items, validity and reliability in observation studies

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: One of the cost effective measurement of physical activity (PA) and sedentary behavior is a questionnaire but the questionnaire items are various depending on the studies and the accuracy of them are still unclear. The aim of the review was to compare the questionnaire items of PA questionnaires (PAQs) and SB questionnaires (SBQs) and summary their validity and reliability evidences based on objective PA measures.

Methods: This study was focused on the self-administrated PAQs and SBQs employed in general population based cohort studies targeting healthy adults or used in multiple countries (IPAQs and GPAQs), which were listed and categorized into five activity domains, such as leisure time exercise, occupation, transport, house-work and others. The study findings were obtained from PubMed and EBSCO, and including 'research name or questionnaire name' and 'validity or validation' as keywords for the validation assessment. Another inclusion criterion was to conduct the validation study utilizing objective PA measures including DLW, accelerometer, pedometer, PA log and other PAQs as reference among healthy adults.

Results: A total nineteen PAQs and six SBQs met the inclusion criterion to summary the questionnaire items, but validation studies of the questionnaires were found in only eleven PAQs and six SBQs. Most PAQs covered at least 1 to 3 leisure time exercise items. However, compare to Western PAQs which covered occupation and sedentary behaviors items, Asian PAQs did not included those items, except CKB and KOGES. Screen time and occupation items related to sedentary behavior were covered by most SBQs. Overall 71 validation studies (65 related PAQs, 6 related SBQs), median reliability correlation coefficients were 0.60 [95%CI; 0.14 to 0.96] in PAQs and 0.64 [95%CI; 0.32 to 0.93] in SBQs. Median validity coefficients ranged from 0.11 to 0.54 (median; 0.31) in PAQs and from 0.12 to 0.74 (median; 0.54) in SBQs.

Conclusions: Items that most PAQs focused on are only leisure time exercise. Although PAQs and SBQs showed moderate reliability, validity of PAQs was low. Therefore, future studies to employ PAQs and SBQs should be aware of applying the appropriate study design or methodology to evaluate PA more correctly in healthy adults.

P1.192

Weekday and weekend patterns of objectively measured sitting, standing, and stepping in a sample of office-based workers: The Active Buildings study

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

There has been little research into the levels and patterns of physical activity in office-based workers and few studies using objectively measured sitting and standing. Understanding these patterns may identify daily times opportune for interventions to displace sitting with activity.

Methods:

A sample of office-based workers (n=164) residing in England wore ActivPal accelerometers for 24 hours a day for five consecutive days, always including weekends and during bathing and sleeping.

Results/findings:

Total sitting / standing time was similar on weekdays (10.6 / 4.1 hrs) and weekends (10.6 / 4.3 hrs).

Total step count was also similar over weekdays (9682 ± 3872) and weekends (9518 ± 4615). The highest physical activity levels during weekdays were accrued at 0700 to 0900, 1200 to 1400, and 1700 to 1900; and during the weekend at 1000 to 1700. During the weekday the greatest amount of sitting was accrued at 0900 to 1200, 1400 to 1700, and 2000 to 2300, and on the weekend between 1800 and 2300. During the weekday the greatest amount of standing was accrued between 0700 and 1000 and 1700 and 2100, and on the weekend between 1000 and 1800. On the weekday the highest number of sit/stand transitions occurred between 0800 to 0900 and remained consistently high until 1800. On the weekend, the highest number occurred between 1000 to 1400 and 1900 to 2000.

Conclusions:

Office based-workers demonstrate high levels of sitting during both the working week and weekend. Interventions that target the working day and the evenings (weekday and weekend) to displace sitting with activity may offer most promise for reducing population levels of sedentary behavior and increasing physical activity levels, in office-based workers residing in England.

P1.193

A Review of Research on the Canadian Children's Fitness Tax Credit: Is the Emperor Wearing any Clothes?

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SIG: Yes, Policies and environments

Awards: No

Objective: To review research on the effectiveness of the Children's Fitness Tax Credit (CFTC). The Government of Canada introduced the CFTC in 2007 with the intent that it would offset the costs associated with participation in organized physical activity (PA). The CFTC allows a taxpayer a non-refundable tax credit (i.e., it reduces the amount of income tax a person pays) of up to \$500 to register a child under 16 years of age in an eligible PA program. In November 2014, the credit limit was increased to \$1,000.

Method: A review was conducted on three studies of the CFTC (Canadian Fitness Lifestyle Research Institute, 2010; Fisher et al., 2013; Spence et al., 2010).

Results: Though the majority of Canadian parents believe the CFTC is important to increasing the PA of children, fewer than 20% report the CFTC influenced the PA participation of their child. No other information is available on the effectiveness of the CFTC. However, the tax credit is inequitable for a large segment of Canadian children. Specifically, parents from low-income families reported to be less aware of the CFTC, less likely to have claimed it in the previous tax year, and be less likely to have plans to claim it in the current year. Basically, they could not afford the costs associated with registering a child in organized PA and thus were unable to take advantage of the tax credit. Furthermore, because the credit is non-refundable, low-income families may not even qualify for it. Analyses of actual claims data support these findings in that parents from higher income households were much more likely to claim the CFTC than those in lower income households. Families earning more than \$100,000 per year claimed \$125 to \$250 more for the CFTC than those making less than \$20,000. Furthermore, families living in smaller communities and rural areas were much less likely to claim the CFTC.

Conclusions: The CFTC is inaccessible to a large proportion of the Canadian population and has demonstrated almost no effectiveness. Therefore, the CFTC may promote health inequity among Canadian children by wasting funds that could be used otherwise.

P1.194

Levels and patterns of physical activity and sedentary time among superdiverse adolescents in East London: A cross-sectional study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Little is known about the physical activity (PA) and sedentary time (ST) habits of adolescents from superdiverse communities in the UK. The purpose of this study is to examine and report the patterns of PA/ST among adolescents in East London living in superdiverse communities, to identify opportunities/barriers to PA and inform policy/practice.

Methods: 1,497 Year 7 (aged 11-13) young people from 7 secondary schools in East London completed a questionnaire on PA/ST over the past 7 days as part of the Newham's Every Child a Sports Person (NECaSP) intervention. Socio-demographic and anthropometric data was obtained. Significance tests were conducted to determine differences between socio-demographic and anthropometric predictors and PA/ST. Multinomial logit regression was used to explore the effects of sex and BMI on PA levels.

Results: Males were significantly more likely to engage in PA at least 5 times during school in the past week ($U=5.07$, $z=-11.76$, $p<.05$). Obese participants were less likely to report engaging in PA 5 times in the past week ($U=4.11$, $z=-1.17$, $p<.05$). Asian Chinese ($U=8.01$, $z=-1.31$, $p<.05$), Black Caribbean ($U=5.08$, $z=-1.92$, $p<.05$) ethnicities were significantly more likely to report engaging in no activity. Multinomial logit regression analyses revealed that girls with higher BMI were less likely to engage in PA at least 4 times after school in the last week than boys ($b=.11$, Wald $X^2(1)=9.81$, $p<.01$). Walking (36.4%), jogging/running (29.9%), and football (28%) were the most frequently reported activities.

Conclusions: Engaging girls in after school PA is important and making sports clubs and activities available and attractive to this target group may help increase engagement in PA and reduce ST. Findings support the need for more culturally responsive pedagogy in schools with curricula that respects diversity and individuality and has meaning and value amongst superdiverse young people.

P1.195

Risky outdoor play and health indicators in children: A systematic review

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Recent generations are experiencing childhoods that look fundamentally different from those of previous generations. Limits placed on children's access to risky outdoor play opportunities has been discussed in terms of the potential adverse and beneficial health outcomes. The purpose of this systematic review was to investigate the relationship between risky outdoor play and health indicators in children aged 3-12 years.

Methods:

A comprehensive systematic search of electronic databases yielded 2111 records on risky play behaviours and supportive environments. Supplemental searches were conducted to target independent mobility and rough-and-tumble play specifically. Papers were excluded if the behaviour did not occur outdoors, if it was structured/organized sport, and if it was risky substances or sexual behaviours. The evidence from included studies was grouped by type of risky play and subdivided by health indicator. Risk of bias for individual papers was examined in line with the Cochrane Handbook. The GRADE framework was used to assess the quality of evidence from this review. Heterogeneity of data prevented meta-analysis and data were described using narrative synthesis.

Results:

Eighteen eligible studies (21 papers) were identified from 8 countries, with a cumulative sample of ~50,015 participants. The final sample included 7 studies where children can disappear/get lost, 1 study involving great heights, 5 studies of rough-and-tumble play, and 5 studies of play supportive environments. The systematic review revealed overall positive effects of risky outdoor play on a variety of health indicators, most commonly physical activity, but also sedentary behaviour, social health and behaviours, and aggression, as well as minor negative health effects (i.e., injuries) that were outweighed by the positive effects on other health indicators. Included studies were largely cross-sectional. The review indicated the need for additional "good quality" studies.

Conclusions:

The positive results stemming from this review, the compelling multi-disciplinary evidence that was excluded from this review, as well as precedents from some European nations, indicate the need to encourage immediate action to support children's risky outdoor play opportunities.

P1.196

Agreements between subjective and objective activity measures differ by body fat distribution

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Among the few studies that compare concordance between activity measures, these studies only assess activity levels for a short period or based on proxy measures. The study objective is to compare the agreement between the four commonly-used activity measures [subjective: Physical Activity Recall (PAR) and International Physical Activity Questionnaire (IPAQ); **Objective:** Omron pedometer HJ-720ITC and Actigraph GT3X accelerometers].

Methods: The study sample consisted of 130 adults in Taiwan (78% female, mean age =21.1±1.2). Participants were asked to complete all 4 subjective and objective activity measures for the same 7 days. Total body composition was measured using a bioelectric impedance analyzer.

Results: Compared to the estimates by IPAQ, accelerometer-derived estimates were lower in sedentary behavior and higher in vigorous physical activity (VPA) and moderate physical activity (MPA) (p<0.001). Compared to the results by PAR, the estimated time spent in sedentary behavior is higher while estimated time spent in light physical activity (LPA) is lower based on data by accelerometers (p<0.001). After being adjusted for age, gender, and percent body fat, there were small-to-moderate associations between PAR and accelerometers in LPA (r=0.43, p<0.001), sedentary behavior (r=0.20, p=0.03), and VPA (r=0.21, p=0.02). We further dichotomized participants into higher and lower percent body fat by sample median, and found that the agreement between PAR and accelerometers were higher among individuals with lower percentage body fat (low percent body: r=0.34-0.58, p=0.001-0.04; high percent body: r=0.29-0.42, p=0.001-0.02). For the agreements between objective measures, steps by accelerometers was highly correlated with steps by accelerometers (r=0.78, p<0.001); this correlation became stronger in individuals with low percent body fat (low percent body fat: r=0.81, p<0.001; high percent body fat: r=0.75, p<0.001).

Conclusions: Agreements were the highest between PAR and accelerometers, and, those agreements were higher among individuals with lower body compositions. Body compositions should be considered while comparing activity estimates across measurements. Extra cautions need to be taken while evaluating the compliance with guideline for physical activity. Future studies should focus on how to synchronize the activity estimates between measures to make them compatible.

P1.197

Parent-child relationship in pedometer-assessed weekday and weekend physical activity and screen time

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SIG: Yes, Children and families

Awards: No

Purpose:

This study focuses on determining the relationship between parents' behaviour (step count (SC) and screen time (ST)) and children's SC on weekdays and at weekends. This study also investigates whether parents' level of SC helps children achieve step count recommendations.

Methods:

The participants (388 parents aged 35-45 and their 485 children aged 9-12) were randomly recruited from 21 Czech government-funded primary schools. The participants recorded SC and ST duration for seven consecutive days (≥ 10 h/day) during April-May and September-October 2013. The associations between parents' behaviour (SC and ST) and children's SC were estimated using general linear regression. Logistic regression (Enter method) was used to examine the achievement of the recommendations of 11,000 SC/day for girls and 13,000 SC/day for boys.

Results:

Each 1,000 SC increase in mothers' (fathers') SC/weekday was associated with an extra 261 SC/day in their daughters and 413 (244) SC/day in their sons. Each 1,000 SC increase in mothers' (fathers') SC/weekend day was associated with an extra 523 (386) SC/day in their daughters and 508 (435) SC/day in their sons. A reduction in mothers' ST by 30 minutes per weekend day was associated with an extra 494 SC/day in their daughters and 467 SC/day in their sons. The children of fathers and mothers who met the weekend recommendation of 10,000 steps were 5.48 (95% CI: 1.65; 18.19; $p < 0.01$) and 3.60 times, respectively (95% CI: 1.21; 10.74; $p < 0.05$) more likely to achieve the weekend recommendation than the children of less active parents. The children of mothers who reached the weekday SC recommendation were 4.94 times (95% CI: 1.45; 16.82; $p < 0.05$) more likely to fulfil the SC recommendation on weekdays than the children of less active mothers.

Conclusions:

This study reveals a quantifiable relationship between parent-child SC/day and mothers' ST and children's SC at weekends. Weekend days are more suitable for the implementation of family-based interventions. A replacement of at least 30 minutes of time that parents (especially mothers) and children spend together in sedentary pursuits with joint physical activity may result in increased weekend physical activity by a perceptible 500 SC/day.

P1.198

Differences in psychosocial beliefs, phases of physical activity change and physical fitness: a cross sectional analysis of working-aged Finnish men.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective:

Motivational factors have been shown to predict engagement in physical activity (PA), but interrelationships between psychosocial beliefs, intentions and physical fitness have been less studied. This study explored differences in psychosocial beliefs and phase of PA change in three fitness categories of Finnish working-aged men.

Methods:

Data comprised 845 Finnish men aged 18-64. Physical fitness was assessed with a body fitness index (BFI) constructed on the basis of the Polar OwnIndex Test, a hand grip test and an Inbody 720 body composition analysis. The men were classified into low ($n=158$), moderate ($n=363$) and high ($n=324$) BFI groups. A novel measure of psychosocial beliefs was used to evaluate perceived social support and norms, action planning and self-efficacy (Cronbach's $\alpha=0.74-0.80$). PA change was categorized into preintention, intention and action phases. Differences in psychosocial beliefs within phases of PA change and fitness categories were examined with one-way ANOVA and logistic regression analyses.

Results:

Psychosocial beliefs were positively related to BFI, but linear association with phases of PA change existed only in low-fit men. Among low-fit men higher scores of self-efficacy and action planning differentiated actors (19%) from intenders (44%) and preintenders (37%): Actors were more likely (OR 4.3, 95% CI 1.7-10.9, $p < 0.003$) to report preparatory actions and goals for PA than other low-fit men. However, in moderate and high-fit men, intenders had lower score for self-efficacy and action planning than preintenders and actors. High social support and norms distinguished low-fit actors from preintenders and high-fit actors from intenders.

Conclusions:

The study demonstrated differences in psychosocial beliefs across fitness levels and phases of PA change. Understanding the nature of PA intentions and psychosocial beliefs in low-fit men could help targeting PA programs to this hard-to-reach group. Further study should investigate feasibility of the used psychosocial measure.

P1.199

OBJECTIVELY MEASURED PHYSICAL ACTIVITY AND SEDENTARY TIME AND SELF-REPORTED SCHOOL TRAVEL MODE IN A POPULATION OF ENGLISH SECONDARY SCHOOL STUDENTS (11-12 YEARS): THE MOVE PROJECT

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Worldwide few school-aged children engage in sufficient physical activity (PA) to benefit health. In the UK, evidence in secondary school children on levels of PA and sedentary time (ST) and the contribution of school travel mode to daily PA is limited. This study reports on levels of PA, ST and school travel mode in a population of English secondary school students.

Methods:

The 'MOVE project' evaluated the impact of two education interventions on PA and wellbeing in 60 secondary schools in North East England (2012-14). At baseline (winter/spring terms), accelerometer data (Actigraph) were collected in a sub-sample of 1031 (48 % male) Year 7 students over 7 days. Demographic and travel mode data were collected via online questionnaires and linkage with the English national pupil database. Accelerometer count data was reduced into intensity estimates using cross-validated cut-points¹, and standardised to average valid wear time. Wear criteria was 406 minutes for weekdays and 351 minutes for weekends - calculated using the 70/80 rule. For calculation of weekday estimates, cases required ≥ 2 valid days; for weekend ≥ 1 valid day; and for total week \geq any 3 days. Preliminary analysis has utilised single level non-parametric methods. Multi-level modelling accounting for school level clustering is ongoing.

Results:

744 students (72%) returned valid total week accelerometer data, with an average of 647 minutes of wear per day. This population are sedentary for approximately 7 hours per day, with very few meeting daily MVPA recommendations (13% of total sample). As a whole, Year 7 students are less sedentary on weekends but engage in more MVPA on weekdays. Sex differences in PA and ST (in favour of boys) are apparent on weekdays only. Approximately 50% of the population actively travel to school, and those who walk to/from school accrue around 10 minutes more MVPA per day than those who take passive modes of transport.

Conclusions:

Preliminary data analysis suggests that schools should remain a prime target for interventions to increase PA and reduce ST, with active school travel a potentially important method for improving daily MVPA.

¹Evenson et al (2008), Journal of Sports Sciences 26, 1557-1565.

P1.200

Patterns and correlates of screen time among adolescents in Bangladesh

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SIG: Yes, Cancer Prevention and Management

Awards: No

Objectives: Screen time (i.e., television/DVD, video games, computer use, face-book/twitter) has been negatively associated with several health outcomes including obesity and cardiovascular disease. To date, no studies in Bangladesh have examined screen time in adolescents. The purpose of this study was to investigate the patterns and correlates of screen time among adolescents in Bangladesh.

Methods: A total of 898 students (439 boys, 459 girls; mean age 14.27, SD 1.15) from eight secondary schools of Dhaka city, Bangladesh completed a self-administered questionnaire. A modified version of the Adolescent Sedentary Activity Questionnaire was used to collect information on screen time on past week, including weekdays and weekends. Screen time was categorised as ≤ 2 hours or > 2 hours per day, reflecting a widely used screen time recommendation. Parents completed a separate questionnaire to provide house-hold/family level data.

Results: On average, Bangladeshi adolescents reported of having had 4.47 hours (SD=3.10) of screen time daily with boys contributing more than girls (4.78 hr and 4.19 hr, respectively). About 79% of the adolescents reported of having had more than 2 hours/day of screen time, with higher rates on weekends (89%) than weekdays (75%). About 83% of the boys reported to have high screen time (> 2 hr/day) compared to 76% of the girls. The main contributor of screen time included watching television and use of social media with about 3 hours each during weekends. Multilevel modelling revealed that high screen time (> 2 hr/day) was associated with travel to school by car, having high family income, having carbonated soft-drink 3+ times per week, lack of having vegetable/fresh fruit on daily basis and not having a play field in the school.

Conclusions: This study identifies characteristics of adolescents who need special attention to reduce their screen time. Longitudinal studies are needed to better understand the relationships between these variables in order to formulate pragmatic strategies to combat this issue.

P1.201

The sedentary behaviour in university employees study: a socio-ecological approach

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Sedentary behaviours (SB) can be characterized by low energy expenditure (e.g., sitting), especially in the workplace or during transport, and prolonged SB is associated with increased risk for chronic conditions. Due to technological advances, much of Singapore's working class is in office settings with high occupational exposure to SB. This study aims to assess SB among office workers in Singapore and to identify the determinants contributing to SB in the workplace.

Methods: Using a mixed-methods approach guided by the socio-ecological framework, non-academic office workers from a professional school in a large public university were recruited. Validated questionnaires captured self-reported SB and physical activity (PA). Semi-structured focus group discussion (FGD) was conducted to further understand perceptions, attitudes, and strategies to reducing workplace SB. The transcribed FGD was coded into meaning units and clustered into higher order themes. Environmental factors were systematically evaluated by trained research staff using an adapted version of the Checklist for Health Promotion Environments at Worksites (CHEW).

Results: Of 180 eligible participants, 40 office workers completed all assessments with the sample mostly Chinese (n=33, 80%) females (n=24, 60%) who worked 5±0.3 days/week for about 9.5(9.5) hrs/day. Median sitting time in the office was reported at 7hrs with 70% reporting ≥6hrs of sitting time and 23 (57.5%) participants reporting taking only 0-1 breaks per hour. From the qualitative analyses, major themes emerged including workplace social and cultural norms, personal factors, job scope, informative environment and physical building/office infrastructure. CHEW results indicate a lack of support from the physical and informative environment for reducing SB; lifts are visible and accessible while stairs are not attractive, convenient, or user-friendly.

Conclusions: There is high SB among office workers at the site. We identified multiple levels of influence on office workers engaging in prolonged SB, with a particular emphasis on workplace norms and infrastructure as important barriers to reducing SB and increasing PA. A larger, representative sample of the Singaporean population is needed to confirm our findings but it seems that any intervention aimed at reducing SB in the workplace should target individual, environmental, and organizational levels.

P1.202

Physical activity and sedentary behaviour during cardiac rehabilitation: The importance of community-level correlates

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Research in cardiac rehabilitation (CR) has ignored the potential importance of community level activity correlates. Therefore, the present study examined the association between community-level variables (i.e., socioeconomic status (SES), urban vs. rural) and the minutes / day of light physical activity (LPA), moderate to vigorous physical activity (MVPA), and sedentary behaviour in CR patients.

Methods: Patients from the *ENCORE* study were asked to wear an accelerometer + GPS unit for 9 days at the beginning (i.e., within the 1st 3 weeks) and end (i.e., within the last 2 weeks) of CR and complete a social ecological survey. The patients' addresses were geocoded in ArcGIS 10.0 and linked to their respective community boundaries using the Nova Scotia Community Counts database. The SES (i.e., a combined score of median income, education, and unemployment rate ranging from -6 to +6) and urban vs. rural (i.e., an urban area was defined as having a population of at least 1,000 and a density of 400 or more people per square kilometre) data were then abstracted for each patient's community.

Results: There were 190 patients (44 female; 146 male) at baseline and 155 at the end of CR who had ≥ 3 valid days (i.e., ≥ 10 hours of wear time / day) of accelerometer data to be included in the analysis. Multiple regression analyses showed that patients living in higher SES communities (i.e., compared to low and moderate) engaged in significantly more minutes / day of LPA at the beginning ($\beta = .16, p = .03$) and end ($\beta = .18, p = .02$) of CR controlling for age, gender, education, BMI, and # of comorbidities. Conversely, increased SES was negatively associated with the minutes / day of sedentary behaviour at the beginning ($\beta = -.15, p = .04$) and end ($\beta = -.20, p = .02$) of CR. Rural patients were also significantly more sedentary at baseline ($\beta = -.14, p = .04$).

Conclusion: CR programs may need to place more emphasis on community-level factors when discussing LPA and sedentary behaviour with their patients.

P1.203

A Cross-Sectional Examination of Toddlers' Physical Activity and Sedentary Time in London, Canada

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: To objectively measure the physical activity levels and sedentary time of a sample of toddlers in London, Canada. This study also sought to compare the participants' activity and sedentary levels to national physical activity and sedentary guidelines for children under the age of 4 years. Little research exists exploring these behaviours among the toddler age group; this is the first study in Canada to explore this population's physical activity and sedentary levels.

Methods: Forty-seven toddlers ($M_{age} = 25.8$ months) across London, Canada participated in this cross-sectional study. Actical™ accelerometers were worn by participants for seven consecutive days (during waking hours) to objectively measure physical activity and sedentary time using a 15-second epoch length. Parents/guardians completed a demographic questionnaire. Descriptive analyses and frequencies were used to examine the accelerometry data. Independent sample *t*-tests were conducted to describe the relationship between toddlers' activity and sedentary levels based on various items outlined in the demographic questionnaire (e.g., sex, attendance in childcare, etc.).

Results: On average, male toddlers engaged in 505.92 minutes ($SD = 49.93$) of sedentary time and 104.91 minutes ($SD = 36.41$) of light physical activity. In comparison, female toddlers spent 507.35 minutes ($SD = 45.70$) and 90.31 minutes ($SD = 30.20$) in sedentary time and light physical activity, respectively. Both male and female toddlers accumulated zero minutes of moderate-to-vigorous physical activity (MVPA). Only 4.6% of the sample met and/or exceeded the Canadian physical activity guidelines of 180 minutes of daily activity. No statistically significant differences in physical activity and sedentary time based on sex or childcare attendance were reported ($p > .05$).

Conclusions: Results indicate that Canadian toddlers engage in low levels of physical activity and high quantities of sedentary time. The lack of MVPA observed among this young sample could be attributed to their current and ever-developing gross motor abilities. Low rates of MVPA could also be a consequence of the limited cut-points available for interpreting Actical accelerometer data among this population. Additional research is required to confirm these findings and to explore methods of promoting active behaviours among this group (and minimizing sedentary ones).

P1.204

Physical activity, neighbourhood factors and social support correlates among Aboriginal and non-Aboriginal Australians

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective: Physical inactivity is the third leading cause of the burden of disease for Australian Aboriginal adults and the majority of Aboriginal people are sedentary or exercising at low levels. Aspects of the neighbourhood environment and social support are known to influence physical activity (PA). We examined socio-environmental correlates of PA among Aboriginal and non-Aboriginal participants.

Methods: Analyses used cross-sectional self-reported data, collected in 2010 from middle-older aged participants recruited to a sub-sample of the 45 & Up Study. Odds ratios (OR) and 95% confidence intervals (CI) were calculated for achieving the upper threshold of the Australian adult PA guidelines (300 minutes moderate-intensity activity per week), in relation to aspects of neighbourhood built environment and social support for Aboriginal versus non-Aboriginal participants, adjusted for age and sex.

Results: A total of 59,489 (314 Aboriginal; 59,175 non-Aboriginal) participants were included in the analyses. Achievement of the PA guidelines was high in both Aboriginal (63.1%) and non-Aboriginal respondents (65.4%). In both samples, those who were advised by a General Practitioner (GP) to be more active had lower odds of achieving PA guidelines. In the non-Aboriginal models, higher odds of achieving PA guidelines was associated with being female, married / cohabiting, living outside a major city, higher education and income, greater social support from, and interactions with, family, friends and neighbours as well as perceived neighbourhood safety, footpath and transport provision. Participants who were younger and living in neighbourhoods with walkable amenities and free/low cost recreation facilities had lower odds of achieving PA guidelines. In the Aboriginal sample, the majority associations trended in the same direction, but were not significant.

Conclusions: Middle-older aged Aboriginal and non-Aboriginal participants achieved similar levels of PA and received targeted GP advice to be active appropriate to their current PA levels. Neighbourhood factors and social support correlates of physical activity among non-Aboriginal Australians do not appear as salient in Aboriginal Australians which warrants further investigation in larger, representative Aboriginal populations.

P1.205

Evaluating the potential health benefits of a large-scale investment in green space infrastructure within a diabetes 'hotspot' in western Sydney, Australia

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Background

Natural experiments wherein the amount, type and/or quality of green space are modified and then evaluated within the context of health outcomes will help to enhance the quality of evidence for policymakers. The purpose of this study is to evaluate a multimillion dollar investment in the 'Western Sydney Parklands' (WSP).

Methods

The WSP is Australia's largest urban park stretching 27km north to south and spanning many socioeconomically disadvantaged communities where the prevalence of Type 2 Diabetes Mellitus is high. Discussions with the WSP Trust on the nature of developments that have occurred within the WSP since 2009, and the availability of spatial data for deriving measures of exposure, were initiated. Epidemiological data for potential study participants living within proximity of the WSP prior to 2009 was assessed in relation to sample size, relevant outcome measures, potential confounders and the time period of follow-up. A Geographic Information System was used to map areas of the WSP that had been enhanced since 2009. The patterning of outcome measures and confounders were assessed in the baseline data with respect to WSP proximity, which could be potentially treated as an instrumental variable in future analyses.

Results

The '45 and Up Study' was identified as suitable source of epidemiological data to conduct the analysis, with approximately 267,000 people aged 45 years or older participating in a baseline postal survey between 2006 and 2008. Follow-up data collection was initiated in 2012 and is ongoing, with over 120,000 participants contacted by late 2013. A sample of 7,272 participants was selected from the baseline data as they lived between 0-5km of the WSP. Outcome measures include psychological distress, physical functioning, body mass index, physical activity, sitting time, dietary measures, indicators of social support and quality of life. None of the outcome measures were patterned by proximity to the WSP at baseline, though those living nearby tended to be younger, married/cohabiting and with higher incomes.

Conclusion

Once follow-up data becomes available, multilevel models will be used to assess the degree of change in outcome measures over time and in relation to different types of investment in green space.

P1.206

Feasibility of objectively measuring habitual physical activity and sedentary behaviour in White British and South Asian toddlers and their parents - the Born in Bradford cohort study

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: To assess the feasibility of recruiting and objectively measuring the habitual physical activity (PA) and sedentary behaviour (SB) of South Asian and White British toddlers and parents participating in the Born in Bradford (BiB) cohort study.

Methods: Families of 2-3 year olds were informed about the study during routine BiB assessments. Interested families provided contact details and were contacted to discuss participating in the study. Consenting families received home visits for anthropometric measurements, interviews, accelerometer delivery and collection. Participants (children and parents) were instructed to wear the ActiGraph GT3X+ (at the hip, using an elastic belt) throughout waking hours for 8 consecutive days. Descriptive statistics were analysed to test the differences between South Asian and White British families regarding recruitment and compliance (Chi-square).

Results: 160 families (30% South Asian) provided contact details, and 97 (22% South Asians) agreed to enter the study. More White British families agreed to enter the study than South Asians (78% versus 54%; $p=0.006$). We were unable to organise data collection with 17 families (35% South Asians). Of 89 toddlers issued with an ActiGraph, 85% wore the accelerometer for ≥ 1 valid day (no ethnic differences), 34% complied with the 8-day protocol (significantly less South Asians; $p=0.023$), and 75% provided ≥ 3 valid days to assess habitual PA/SB (no ethnic differences). Of 133 parents (60% mothers; 23% South Asians) issued with an accelerometer, 93% wore the accelerometer for ≥ 1 valid day, 41% complied with the 8-day protocol, and 84% provided ≥ 3 valid days to assess habitual PA/SB. Rates of parents complying with the 8-day protocol and providing ≥ 3 valid days did not differ significantly between ethnicities. Some issues arose during data collection (e.g. child refusing to wear accelerometer), but several strategies (e.g. magnet/text message reminders) were used and showed success in promoting compliance.

Conclusions: In this study set in a UK urban environment, South Asian families were significantly harder to recruit, suggesting that greater efforts or different strategies may be required to successfully recruit South Asians into similar studies. However, South Asians consenting to participate are as likely as White British families to provide sufficient data to assess habitual PA/SB.

P1.207

Exploring the impact of wear time upon physical activity estimates in children

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Lack of compliance with accelerometer wear time requirements can potentially lead to selection bias within a study. In an attempt to maximize participant numbers researchers may be tempted to employ more lenient wear time criteria. However, this may lead to misclassification of physical activity (PA) and sedentary time (ST), both through reducing the monitoring period and through failure to capture distinct periods of the day, resulting in inaccurate estimates of PA and ST and masking of true relationships between PA, ST and health. The present study aimed to explore the misclassification that may occur using three distinct 10 hour periods across the day in comparison to 24 hour continuous wear in children.

Methods: 149 children were asked to wear a GENEActiv accelerometer on their left wrist for 24 hours a day, for a period of 7 days. Including only children who complied with the full wear time protocol (n = 78), weekly average estimates of ST and time spent in light, moderate and vigorous PA were created for the full 24 hour criteria and for three 10 hour periods (8am - 6pm, 10am - 8pm, 12pm - 10pm). Repeated Measures ANOVA were used to assess for significant differences across monitoring periods.

Results: In comparison to complete observation (24hours), the 10 hour periods across the day resulted in an underestimation of time spent sedentary and in each activity intensity (ps < 0.05). ST was underestimated by an average of 269 minutes, whilst Moderate to Vigorous PA (MVPA) was underestimated by 30 minutes. Between the 10 hour periods, higher rates of ST were accumulated in the latest period (12pm - 10pm), whilst higher estimates of MVPA were apparent between 8am and 6pm.

Conclusions: Time in PA and ST was underestimated with the use of shorter wear periods and researchers may be unknowingly misclassifying PA and ST by not accounting for which period of the day was measured. Future studies should use longer monitoring periods to gain accurate assessment of PA and to establish relationships with health variables.

P1.208

An afterschool program to promote physical activity in children: The Wollongong SPORT Translational RCT

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

The afterschool period (3-6pm) has been identified as a critical window where children have opportunities to be active. About 10% of Australian children spend this period in formal afterschool care. These settings are characterised by high levels of physical inactivity and sedentary behavior (SB). We developed an efficacious afterschool program (Wollongong SPORT) in the form of an afterschool sport program. The next step, and the aim of this translational study, was to test its potential efficacy when embedded into existing afterschool centres.

Methods:

6-month, 2-arm cluster translational randomized controlled trial involving 76 children aged 5-10 (mean age = 7.9 y; 50% boys) across four afterschool centres. Centres were matched on size and socioeconomic status, and randomised to receive the Wollongong Sport program or usual afterschool care practice (wait-list control). Wollongong Sport is a physical activity and academic enrichment program based on Social Cognitive and Achievement Motivation Theories. For this study, pre-service education students from the local university were trained as "coaches" to implement the program three afternoons per week. The aim of the physical activity sessions was to engage children for at least 50% of the time in MVPA through participation in team sports such as soccer and basketball and activity sessions based on popular TV shows such as *Survivor*. MVPA and SB during the afterschool period were assessed using Actigraph accelerometers. Generalised linear models were used to test the differences between the control and intervention groups. Analyses adjusted for clustering, baseline levels of MVPA/SB, age and sex.

Results:

At follow-up, compared with children in the control centres, children in the intervention centres showed greater increases in the percentage of time spent in MVPA during the afterschool period (adjusted difference = 2.03%, 95% CI -3.82, -0.24; p = 0.037, Cohen's d = 0.35) and greater decreases in the percentage of time spent in SB (adjusted difference = -3.03%, 95% CI -2.18, 8.25; p = 0.171, Cohen's d = -0.30).

Conclusions:

This program and implementation model provides an evidence-based approach to increasing MVPA, which can be easily disseminated in "real-world" community settings.

P1.209

Disentangle the variability of physical activity levels: How to better understand links between physical activity measures and psychological predictors in physical education lessons.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

The objective of this paper is to investigate the variance decomposition of physical activity levels' measures realized during physical education (PE) lessons. Various sources of variance are investigated (occasion, activities, seances, teachers and students) across sedentary, light, moderate and vigorous behaviors. The secondary objective is to compare the influence of various predictors on these variables and to discuss about their importance on students' physical activity levels.

Methods

A two-year multiple occasion measurement study involving more than 1000 students was conducted in the Geneva district. They were asked to wear an accelerometer (Actigraph GT3X) during physical activity lessons and to answer a questionnaire several times (1 to 4 occasions each) during the period.

Results

Variability of sedentary, light, moderate and vigorous activity was decomposed between measurement occasions, activities, seances, teachers and students. Firstly, results showed that variances due to the occasions for all physical activity behaviors displayed are lower than 50%. Variances attributable to measurement occasions are lower in sedentary and vigorous activity (respectively 34 and 35 %) than for light and moderate activity (respectively 49 and 47 %). Moreover, variance attributable to students is more important for vigorous (18 %) than for sedentary, light (approximately 13 % each) or moderate (8%). Teachers are responsible for 12 % of sedentary behaviors whereas they are only responsible for only 5 to 7 % of other behaviors. Results about links between predictors of students' behaviors will also be presented and discussed.

Conclusions

Trying to demonstrate which factors influence students' behaviors is an important goal. However, researchers mostly rely on a single occasion physical activity measurement during PE lessons. Our results showed that occasion measurement represent less than 50 % of the variance of the different physical activity behaviors. Variability attributable to students and teachers is quite different depending on the intensity of physical activity behaviors. Sedentary behaviors are more attributable to teachers than to students. Students are more responsible for vigorous behaviors than teachers. These results have important implications for teachers but also for researchers interested in determining the links that exist between physical activity determinants and students' behaviors.

P1.210

The relationship between physical activity, sedentary time and disease activity with well-being in patients with Rheumatoid Arthritis

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Rheumatoid arthritis (RA) causes joint pain, stiffness, swelling and can lead to structural damage and physical dysfunction. Consequently, people with RA commonly experience psychological distress and report reduced wellbeing. Exercise interventions in patients with RA lead to improved psychological wellbeing, without aggravating symptoms or inducing further joint damage. The aim of the present research was to determine associations between objectively assessed levels of habitual physical activity (PA) and sedentary time (ST) engagement, and indices of psychological wellbeing, namely; anxiety, depression and subjective vitality, in RA patients. The mediating role of disease activity was also examined.

Methods: Data were collected as part of the Physical Activity in Rheumatoid Arthritis (PARA) study. Participants were sixty three patients diagnosed with RA (Mage = 55.52 ± 12.53). Objective PA (light, moderate, vigorous) and ST were measured via 7 days of accelerometry. Reported anxiety, depression and subjective vitality were assessed via questionnaire. Disease Activity was measured using the Disease Activity Score in 28 joints (DAS28) and Erythrocyte Segmentation Rate.

Results: Regressions indicated ST was positively related to depression ($\beta = .40$, $p = <.05$), and negatively associated with subjective vitality ($\beta = -.55$, $p = <.01$). In contrast, light PA negatively predicted depression ($\beta = -.32$, $p = <.05$), and was positively related to subjective vitality ($\beta = .36$, $p = <.01$). Anxiety was unrelated to all PA behaviours. Disease activity was positively linked to depression ($\beta = .37$, $p = <.05$), but was not significantly associated with anxiety or subjective vitality. Mediation analysis ($N = 24$): Hierarchical regressions revealed the positive association between ST and depression, and the negative relationship between light PA and depression, were no longer significant after adjusting for disease activity (sedentary, $\beta = .55$, $p = .05$, DAS28, $\beta = .38$, $p = .08$, light PA, $\beta = -.40$, $p = .06$, DAS28, $\beta = .34$, $p = .11$).

Conclusions: Findings suggest that reducing ST and increasing engagement in light PA (e.g., sedentary breaks) may enhance feelings of personal wellbeing in patients with RA. In particular, PA engagement may reduce feelings of depression via alleviating disease activity.

P1.211

An 8-week workplace walking intervention increases physical activity behaviour and reduces sitting time.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Walking is a popular physical activity, with established health benefits. Recently, efforts to increase population levels of physical activity have included a focus on promoting walking. In Scotland, Paths for All deliver an 8-week workplace walking intervention that includes several behaviour change techniques including on-line goal setting, self-monitoring through pedometers, and social support. In 2014, the intervention was delivered to 3800 employees and the purpose of this study was to examine changes in the amount and type of physical activity and sitting behaviour following this intervention.

Methods: After registration for the intervention, all participants received an email invitation to participate in the study. From 418 participants who were recruited at baseline, 150 (mean age = 41.66; ± 11.49 years; 119 women) provided physical activity data at both baseline and 1-week post-intervention. Participants completed an on-line version of the 7-day recall IPAQ-Long (Craig et al., 2003) to assess weekly minutes of self-report physical activity and sitting. The data were screened and subsequently paired sample t-tests and Cohen d-statistics were used to identify significance and meaningfulness of changes in each of the sub-types of physical activity and sitting time.

Results: There were small significant increases in walking for transport (+109 mins (46%); CI = 50.79 to 166.52), leisure time walking (+55 mins (24%); CI = 8.78 to 101) and total walking (+192 mins (34%); CI = 93.91 to 291.93). There were no significant changes in other types of physical activity. There were significant small-medium decreases in time spent sitting both during the week (-302 mins (12.65%); CI = -302.13 to -424.81) and at the weekend (-83 mins (14%); CI = -83.34 to 132.54).

Conclusion: A workplace walking intervention can lead to increases in physical activity, primarily through increased walking. Although not a specific target of the intervention, sitting behavior was reduced, over and above the increased amount of time spent walking, possibly providing additional health benefits. Future research with a controlled design and objective measurement would be valuable.

P1.212

THE RELIABILITY AND VALIDITY OF THE EARLY YEARS PHYSICAL ACTIVITY QUESTIONNAIRE (EY-PAQ)

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Introduction: Measuring physical activity and sedentary time in young children (<5 years) is complex. Objective measures (although more reliable than proxy-reports) require specialised expertise, are expensive, and can be burdensome for participants; such issues are amplified when measuring large samples. Therefore, a physical activity and sedentary behaviour proxy-report measure for young children, that is suitable for use at a population level, are needed. This study aimed to assess the test-retest reliability and validity of the Early Years Physical Activity Questionnaire (EY-PAQ).

Methods: To assess test-retest reliability, 109 parents/guardians from Bradford, UK, completed the EY-PAQ on two occasions (7.2 days apart; SD 1.1). The EY-PAQ was administered to parents/guardians either in English (75%) or Urdu (25%) by a trained researcher. Fifty-four EY-PAQ's were validated against accelerometry (ActiGraph GT3X+, worn for 7 days). Children were on average aged 3.3 years (SD 0.8), 53% were girls, and 62% were South Asian. The outcomes produced by the EY-PAQ are daily total physical activity (TPA), moderate-to-vigorous physical activity (MVPA) and sedentary time (ST). Outcomes were calculated by summing behaviours (sedentary/active) spent in different domains. Accelerometer data were summarised in five-second epochs, and ST, MVPA, and TPA were calculated using the Costa et al. cut-points. Reliability of the EY-PAQ over one week was determined using intra-class correlations (ICC). Bland-Altman plots were used to assess agreement between the EY-PAQ and accelerometer measures of ST/MVPA/TPA.

Results: The test-retest reliability was 0.47 for ST, 0.37 for MVPA and 0.29 for TPA. The EY-PAQ had adequate to good agreement with accelerometer-determined ST (mean difference = 1.35 mins.day⁻¹; 95% limits of agreement (LOA) = -288.72-291.43), MVPA (mean difference = -50.63 mins.day⁻¹; 95%LOA = -143.73-43.48) and TPA (mean difference = -20.88 mins.day⁻¹; 95%LOA = -331.91-290.14). The LOA were wide for all variables. There were no meaningful changes in the results when stratified by language.

Conclusion: The EY-PAQ has acceptable validity and test-retest reliability (both English and Urdu languages) and is a promising population level measure, particularly for ST. Further testing is required to confirm the reliability and validity of the EY-PAQ in early year samples from different communities to investigate its generalisability.

P1.213

Physical activity in the lives of young people from two youth centres serving a deprived inner city population: narratives of pasts, presents and futures.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: This research project aims to gain a contextualised understanding of how forms of physical activity fit into the daily lives of young people in a deprived urban area, and of the potential for youth organisations to influence physical activity behaviours of young people at an age when physical activity levels generally decline. The aim of this presentation is to use a lifecourse perspective to consider how physical activity is represented in narratives of young people's lives as they grow up in a socioeconomically deprived area of the UK. Comprehending how physical activity is understood by young people as they consider their younger, present and future selves is necessary to develop appropriate interventions for this group.

Methods: The first youth organisation serves primarily Black and minority ethnic migrant boys and the other serves predominantly low-income White British boys and girls. This research uses innovative ethnographic methods, including, participant observation, 'walk along' and 'ride along' interviews, visual ethnography, participant photography, informal interviews and focus groups with these young people. Transcripts and field notes are thematically analysed and critical medical anthropological and Foucauldian frameworks applied to comprehend how local lived experiences and identities are produced within broader social structures, ideologies and discourses.

Results/findings: The key themes to be discussed here include nostalgia and memories of being active (particularly for girls), notions of desirable bodies, and the self and future self (particularly for young men). I will discuss how factors linked to deprivation have played a role in the formation of present or desired physical activity identities. The case studies I detail here discuss identities surrounding the gym, and cycling for transport or leisure.

Conclusions: This research suggests that physical activity is heavily rooted in the social lives of young people, demonstrating the value of ethnographic methods in helping us develop a detailed, contextualised understanding of the ways in which physical activity fits or does not fit into the lives of young people living in deprived areas.

P1.214

Comparing perceived and objectively measured changes in physical activity and sedentary time after a 12-week Internet-based intervention

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Evidence suggests that physical inactivity and sedentary time (ST) are independent risk factors for poor health. While there have been many successful interventions targeting these lifestyle behaviours, few studies have examined the relationship between perceived and objective changes in physical activity (PA) and ST. The purpose of this study was to compare participants' perceived changes in PA and sedentary time ST with objectively measured changes in PA and ST after a 12-week Internet-based intervention to increase PA and reduce ST in middle-aged male university employees.

Methods: ManUp UWS was a 12-week, two-arm randomised controlled trial comparing an Internet-based intervention (receiving access to the ManUp UWS website and printed materials on PA, ST, and health) to a printed resources comparison group (receiving only printed materials). PA and ST were objectively measured using the ActiGraph GT3X+ accelerometer. Due to poor compliance with accelerometer wear, data were included for all participants who had a minimum of 10 hours wear time per day, for at least 3 days (n=35). Self-reported changes in PA and ST were assessed using a process evaluation questionnaire. Agreement between the two measures was assessed using Cohen's kappa coefficient.

Results: The mean (\pm SD) age of these 35 participants was 49.0y (\pm 7.4), the mean BMI was 30.3kg/m² (\pm 5.0) and 71.4% of participants were non-academic staff. At end of intervention, 25/35 participants (71.4%) reported that their PA had "increased" since baseline, however, objectively measured accelerometer data did not reflect these changes, with only 8/35 participants (22.9%) increasing their PA (kappa coefficient = .119). At end of intervention, 15/35 (43.0%) reported that their ST had "decreased", however, only 7/35 participants (20.0%) reduced ST (kappa coefficient = .250).

Conclusions: Participants' perceived changes in PA and ST were overestimated and not reflective of the objectively measured changes in these behaviours. Objectively measured data is less prone to measurement error and may provide a more accurate representation of an individual's PA and ST, however, it is important to examine perceived changes in lifestyle behaviours to provide a more complete picture of intervention effectiveness.

P1.215

Beyond the individual: evaluating dyadic influences on obesity preventive health behaviors

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SIG: Yes, Cancer Prevention and Management

Awards: No

Purpose: Parent-child relationships have been shown to significantly influence parent- and child-level health behavior outcomes (e.g. diet, physical activity, weight management, etc). Although the obesity literature has made significant progress conceptualizing how parents and children influence one another, there has been limited empirical evidence that has simultaneously modeled the statistical interdependence that often exists between the two. Moreover, there are few public-use resources designed for dyadic-level analyses. The purpose of this study is to illustrate a dyadic-level analysis using the Family Life, Activity, Sun, Health and Eating Study, a forthcoming public-use resource.

Methods: Using FLASHE data, Actor-Partner Interdependence Models (APIM) were examined following procedures recommended for dyadic analyses. Actor effects refer to associations between one's own predictor and outcome (e.g., one's emotion suppression predicting his or her own fruit and vegetable [FV] consumption); partner effects refer to associations between a predictor from the other member of the dyad and one's own outcome (e.g., a parent's emotion suppression predicting a teen's fruit and vegetable consumption, or vice versa). We examined whether emotion suppression predicted FV consumption and examined whether actor-partner effects were stronger among parents or teens.

Results: APIM analyses ($n = 2981$) indicated that actor suppression had a significant negative association with FV consumption ($b = -0.29, p < 0.001$). Partner suppression also had an independent significant association with FV consumption ($b = -0.28, p = .001$). Adolescents ate significantly fewer FV than did parents ($b = -1.18, p < .0001$), but neither actor ($b = 0.06, p = 0.649$) nor partner ($b = 0.07, p = 0.599$) effects for suppression differed between parents and adolescents.

Conclusions: Results highlight a significant negative association between emotion suppression and FV consumption among both parents and adolescents. Moreover, parents' emotion suppression independently predicts less consumption among adolescents, and vice versa, supporting hypotheses that parents and children influence one another. Collecting and analyzing dyadic (parent-child) data represents a significant advancement for the study of obesity prevention. Additional analyses that could be explored using FLASHE data, an forthcoming public-use resource, by ISBNPA participants will be discussed.

P1.216

Advancing the science of behavior change: a look into the future

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SIG: Yes, Cancer Prevention and Management

Awards: No

Purpose: To present the challenges the research community must address for key behavioral targets across levels of influence and new scientific opportunities.

Results: The impact of behavioral research at all levels- biobehavioral and psychological; social and organizational; and environmental- requires a keen understanding of methodologic barriers and effective use of new approaches. As illustrated in the FLASHE Study, behavioral data are becoming increasingly multi-disciplinary and multilevel, which require new analytic research approaches especially when they are longitudinal in nature. Several of the behavioral constructs discussed in FLASHE are difficult to observe (e.g., self-efficacy, relational dynamics), which necessitates precise, efficient, and flexible self-report measures. It is also becoming increasingly easier to combine measures from more than one study conducted in disparate populations using techniques such as integrative data analysis. Successful data harmonization requires consensus measure development, co-calibration, and a research infrastructure to support sharing of measures and their attributes. Despite attempts to harmonize health behavior theories or their component constructs, the field has more theories and constructs than ever before (many with limited empirical support). Consequently, the field remains unable to answer essential questions, such as which theories better predict or explain certain behaviors, or what amount of variance is accounted for by specific theoretical constructs. New measurement and technologic advances may provide better data and improved precision to answer these questions. Sensors such as accelerometers used in the FLASHE study can identify general categories of movements and specific targeted behaviors. The datasets that result from these tools require newer analytic approaches to capture the variability and richness of the data provided. Systems modeling can be leveraged to model nonlinear interrelationships over time. Advances will increasingly require collaboration among social and behavioral science with engineering, computer science, biostatistics, research methodology, mathematical modeling, and biological sciences.

Conclusions: Behavioral scientists must become comfortable with new platforms, data sources, methodologies, conceptual and analytic approaches. Behavioral research has the potential to make progress in addressing key proximal and distal obesity determinants by going beyond the exclusive focus on individual psychological processes, given that those processes emerge in a dynamic social, physical, and informational environment.

P1.219

The Impact of Post-Bariatric Surgery Behavioural Interventions on Psychosocial Outcomes in Adults: A Systematic Review.

Rebecca H. Liu

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Background: Generally, the success of a psychosocial intervention for bariatric surgical patients has been measured by the average amount of weight loss among its participants. However, it has been contested that weight reduction may not be the sole outcome measure to appropriately denote the effectiveness of an intervention.

Purpose: The objective of this review was to synthesize all literature, which investigated the impact of post-bariatric behavioural interventions on psychosocial-related outcomes in adults.

Methods: The search strategy utilized the identification and screening guidelines established by the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) statement. Relevant articles evaluating postsurgical behavioural interventions on psychosocial outcomes were identified using database searches up to June 2, 2014.

Results: A total of 7 studies were identified for inclusion in the review. The effects of behavioural interventions on outcome measures were categorized into five psychosocial areas: Quality of life, emotional regulation, eating-related cognitions, depression and motivation to change, with some studies reporting in more than one area. Overall, improvements in psychosocial health were observed in each area. However not all interventions were evaluated in every psychosocial area, as a result the interpretation of findings should be taken with caution.

Conclusions: Given the state of the literature on this topic, this is the most comprehensive document available which synthesizes the influence of behavioural interventions on psychologically related health measures. Additionally, this review outlines various behavioural interventions that are available to bariatric patients. These interventions may provide the support required for longer-term weight reduction and maintenance, and overall psychosocial health, particularly in light of the fact that this area of research is still in development.

P1.220

The impact of Pre-Bariatric Surgery Behavioural Interventions on Body Composition Measures in Adults: A Systematic Review.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Background: Psychosocial support and behavioural interventions have been shown to improve weight reduction before and after surgery. The health benefits of interventions occurring after surgery have been well researched while the benefits of those interventions delivered prior to surgery have been less documented. More concerning is that psychological-based interventions and support are not routinely incorporated in bariatric surgery treatment protocols in Canada.

Purpose: The objective of this systematic review was to investigate the impact of behavioural interventions on body composition measures among patients, prior to bariatric surgery.

Methods: The search strategy utilized the identification and screening guidelines established by the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) statement. Relevant articles evaluating pre-surgical behavioural interventions on body composition outcomes were identified using database searches up to June 2, 2014.

Results: A total of 6 studies were identified for inclusion in the review. Across four of the studies, patients in treatment/ intervention groups demonstrated greater average weight losses or percent excess weight loss than control/comparator groups, however not all differences reached statistical significance long-term. Furthermore, two of the prospective studies did not have comparator/control groups and did not determine statistically significant prepost differences. Generally, the impact of presurgical psychosocial interventions facilitated improvements in body composition and demonstrated the utility of behavioural treatment within their programs.

Conclusions: The importance of implementing routine behavioural treatment into bariatric surgery protocol, whether before and/or after surgery, may prevent patients from experiencing weight regain. Overall this systematic review provides an evidence-based overview of behaviour modification therapies offered prior to weight loss surgery, which promote weight reduction and may potentially better prepare individuals of lifestyle changes after bariatric surgery.

P1.221

Six-month changes in body weight, physical activity and sedentary behavior in Australian first year university students

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

International evidence suggests that university students typically gain up to 2.3 kg and reduce physical activity in their first year of study, however there are currently no data to ascertain whether a similar pattern occurs in Australia. The purpose of this study was to examine 6-month changes in weight, physical activity and sedentary behavior in Australian first year university students.

Methods:

A sample of n=149 first year university students [n=60 residential college students and n=89 community-dwelling; 64.4% female, 17.4 [standard deviation (SD) 0.62] years of age] were recruited from a metropolitan and rural campus of an Australian university. Weight and height were directly measured and physical activity and sedentary behavior were self-reported via questionnaire within their first month of commencing university (March) and at approximately 6-months follow-up (September). Analyses were conducted using random effects mixed modeling.

Results/findings:

At baseline, average (SD) weight was 62.5 (12.6) kg and BMI was 21.8 (13.15) kg/m². Students accumulated an average of 1496 (1172) MET.min/week of physical activity, with 56.4% reporting participation in high levels of physical activity (≥ 1000 MET.min/week). Average sedentary time was 7.2 (2.4) hours/day, with 34.3% classified as high-very high sitters (≥ 4 hours/day). At 6-month follow-up average weight increase was 1.77 (3.1) kg ($p < 0.01$), with college students gaining significantly more than non-college students [2.56 (3.18) kg compared with 1.23 (2.92) kg, respectively; $p < 0.01$]. Body mass index increased in a similar pattern ($p < 0.01$), however BMI category did not shift. While there was no significant increase in time spent sitting (hours/day) over time for the whole sample, the college students spent significantly more time sitting than non-college students at follow-up (+0.8 hours/day), relative to baseline ($p = 0.04$). No significant differences in physical activity (MET.min/week) over time or between groups were observed.

Conclusions:

These findings suggest that Australian university students experience significant weight gain within the first six months of their first year of studies, and rate of weight gain may be higher than in their international counterparts. Given that physical activity and sedentary behavior did not change over time, changes in diet and alcohol intake should be explored further.

P1.222

A randomised controlled trial of a text supported weight maintenance programme: Lighten Up Plus

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SIG: Yes, e- & mHealth

Awards: No

Purpose:

In the United Kingdom, 12 week duration free commercial weight loss programmes are often offered to overweight and obese adults resulting in weight loss. However, maintaining weight loss is a challenge and many people rapidly regain weight. Text messaging, in disease management, has been identified as an effective tool for behaviour change. Our aim was to evaluate a text-supported weight maintenance programme (FLorence Telehealth) for participants that have attended a free 12 week commercial weight loss intervention.

Methods:

We conducted a randomised controlled trial with participants individually allocated to usual care or 12 week text intervention (weekly request to participant to send their self-reported weight with follow-up supportive message based on weight maintenance/loss/regain). The intervention was based on self-regulation theory. Follow-up was 3 and 9 months from randomisation. Primary outcome: difference between baseline weight and independently measured weight at nine months following randomisation. Secondary outcomes include self-reported weight loss at 3 months following randomisation, current strategies for weight management and BMI at nine months.

Results:

We recruited 384 participants: mean age 47 years, 20% male, 18% from a minority ethnic group, mean weight at start of maintenance intervention 93.2kg (sd 16.1).

Participants engaged well with the intervention, with a median (IQR) of 9 (3, 13) weights returned. 15 (7.8%) intervention participants did not return any weights, 31 (16.3%) requested for the texts to stop.

At 3-months the intervention group lost 1.87 (4.5)kg and the control 1.85 (5.6)kg, mean difference 0.01kg (95% CI -1.22, 1.09). At 3 months 125 (82.2%) of the intervention group and 114 (72.6%) of the control group reported self-weighing at least weekly ($p < 0.04$). However, there was a high level of continued engagement with the commercial weight management programmes (54.6% in intervention group and 42% in control group).

The 9 month objective weight data has been completed and will be reported.

Conclusions:

This trial will contribute evidence as to whether the addition of text-support to commercial weight loss programmes can help obese/overweight individuals maintain weight-loss in the medium to long term.

P1.223

Physiological and Metabolic Responses to a High-fat Meal Ingestion in Reduced Weight and Relapsed Weight Women: The Mind the Gap Study

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Statistics reveal that 83% of those who successfully lose at least 10% of their initial body weight return to starting weight within 1 year after treatment. The aim of the present study was to explore for differences in resting and postprandial physiological responses among successful weight loss maintainers and weight loss relapsed individuals. Differences between these groups and weight stable BMI and age matched individuals with no history of weight loss may implicate specific physiological pathways for weight loss relapse.

Methods: 56 women were recruited into 4 groups: reduced-overweight/obese subjects (RED, n=15) or BMI matched low-weight controls (LW-CTL, n=19), and relapsed-overweight/obese subjects (REL, n=11) or BMI matched high-weight controls (HW-CTL, n=11). Energy intake (EI), macronutrient intake, fasted and post-prandial metabolic rate (MR), substrate oxidation and thermic effect of feeding (TEF) were measured.

Results: No differences were found in average total daily EI, fasted or post-prandial MR and TEF among the 4 groups. RED, HW-CTL, REL ingested significantly less carbohydrates (% of total daily intake) compared to LW-CTL ($P<0.02$) and ingested significantly more fat compared to LW-CTL.

Conclusion: The metabolic homogeneity among groups implies that weight regain may be attributed to differences in psycho-behavioural factors rather than differences in metabolic profile. Indeed, between-group differences in macronutrient intake are evident suggesting that conscious behavioural modifications in dietary intake may play an integral role in successful weight loss efforts.

P1.224

What is the impact of cognitive dietary restraint on eating behaviors during an energy restricted intervention?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Background: Weight loss has been associated with changes in eating behaviors and appetite sensations that favor a regain in body weight. Since traditional weight loss approaches emphasize the importance of increasing cognitive dietary restraint (CDR) to achieve negative energy imbalance, it is difficult to untangle the respective contribution of energy restriction and CDR on factors that can lead to weight regain. The objective of this study was to compare the effects of energy restriction alone or combined to CDR on eating behaviors and appetite sensations in overweight and obese women.

Methods: Preliminary analyses were performed with 44 women (40.1 ± 6.7 years; 32.4 ± 5.8 kg/m²) who were provided with a low energy density diet corresponding to 85% of their energy needs during a four-week period. Women were either assigned to a condition focusing on the importance to stick to the hypocaloric diet in order to lose weight, thus favoring and increase in CDR (CDR+ group) or a condition in which women were not told that the diet was hypocaloric in order to prevent an increase in CDR (CRD- group). Women were tested before ($T=0$) and after the intervention ($T=4$ weeks) and 3 months later. Anthropometric variables were measured and the Three-Factor Eating Questionnaire was completed in order to assess eating behaviors. Appetite sensations were evaluated using visual analog scales in response to a standardized breakfast.

Results: Significant weight loss ($p<0.001$) was observed in both groups (CRD+:-2.4 \pm 1.3kg; CDR-:-2.2 \pm 1.1kg) in response to the 4-week intervention and was maintained three months later ($p<0.001$). There was a significant increase in dietary restraint in the CDR+ group while no such change was observed in the CDR- group ($p=0.0087$). In both groups, flexible control slightly increased ($p=0.0093$) while disinhibition ($p=0.0037$) and hunger ($p=0.0260$) decreased in response to the intervention. Appetite sensation values did not change in response to the intervention in neither group.

Conclusion: These preliminary results suggest that our experimental design was appropriate since an increase in dietary restraint was induced in the CDR+ group while creating a significant weight loss in both groups. No additional significant between-group differences were observed for other eating behaviors and appetite sensations.

P1.225

Self-determined motivation towards physical activity and nutrition in adolescents involved in a multidisciplinary lifestyle intervention: a pilot study

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SIG: Yes, Children and families

Awards: No

Purpose: The prevalence of obesity has increased dramatically among adolescents. Consequence of the rising prevalence of obesity is an earlier manifestation of physical and psychological problems. In this regard, health care professionals are confronted to the challenge of properly treating this condition. However, poor maintenance of treatment-induced weight loss remains a major challenge in the management of obesity. Thus, the main objective of the present study was to examine the impact of self-determined motivation towards physical activity and nutrition on body mass index (BMI) of obese adolescents engaged in a 16-week lifestyle modification program.

Methods: Ten obese adolescents (6 boys and 4 girls) from 12 to 16 years of age (13.0 ± 1.4 years) were selected to participate in this study. The aim of the intervention was to improve nutritional and physical activity habits. Each subject was followed by a multidisciplinary team and trained three sessions per week for 16 weeks. The exercise program focused on endurance type activities and all training sessions were supervised and performed in groups. BMI and self-determined motivation towards physical activity and nutrition were measured at baseline, at mid-time as well as at the end of the intervention.

Results/Findings: On average, BMI (35.1 to 34.3 kg/m²) tend to be reduced after the 16-week intervention program. In order to further explore the contribution of self-determined motivation towards physical activity and nutrition on BMI, subjects were divided as having lower or higher autonomous motivation. We found that adolescents with higher self-determined motivation presented a greater reduction in BMI during the 16-week intervention program ($p < 0.05$). We were also interested to evaluate the effect of self-determined motivation towards physical activity and nutrition on psychological distress during the multidisciplinary lifestyle intervention. Even though not significant, we found that higher self-determined motivation tends to be associated with lower psychological distress during the intervention.

Conclusions: Longitudinal studies will be needed to explore how intervention programs for obese adolescents should be improved. However, these results suggest that autonomously motivated exercise and nutrition behavior contributes to improve weight control in this population.

P1.226

The effect of breakfast size and frequency on diet induced thermogenesis.

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The University of Newcastle, Newcastle, Australia

SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

A systematic review was conducted to investigate the effect of breakfast consumption on measures of resting energy expenditure (REE) amongst adults. This abstract focusses on one finding from this review: the effect of breakfast size and frequency on diet induced thermogenesis (DIT).

Methods:

The Systematic Review protocol was registered in 'Prospero'. The keywords and the inclusion and exclusion criteria were chosen a priori. Databases searched were Cochrane, Cinahl, Embase and Medline. English-language intervention studies (RCT and quasi RCT) in healthy adult participants (no date limit) were included in this review. The quality criteria checklist for primary research of the Academy of Nutrition and Dietetics was used to assess the quality of included studies.

Results/findings:

The initial search identified 473 records; 130 were retrieved after duplicate removals, and inclusion/exclusion criteria were applied by two reviewers independently (AQ & AP). Quality checks on 34 papers were undertaken by AQ & LMW. Of the final 34 papers included findings from two randomised crossover trials investigating the effect of breakfast size and frequency on DIT were extracted. Participants were healthy normal weight adults (20 men; 7 women respectively). Breakfast was consumed after overnight fast as either: one bolus amount over 20 or 10 minutes compared with 4-6 small meals for 10 minutes each consumed every hour over a four hour period (study 1), or every 30 minutes for 150 minute period (study 2). In both trials DIT was significantly higher when isocaloric meals were consumed as a bolus compared to small frequent events (study 1: DIT for 240 min was 6.2 (0.6) % vs 4.7 (0.5) % of energy content of meal (mean (SEM)); study 2: DIT for 5 hours was 241.00 (34.56) kJ/5 h vs 174.47 (25.10) kJ/5 h (mean (SEM)), both p value < 0.05).

Conclusions:

There was a significant increase in DIT associated with a bolus intake, such as breakfast, in a small time frame, compared to smaller, isocaloric, frequent events over a longer time period, such as snacking. This finding may be used to inform the study of weight gain prevention in a long term prospective trial.

P1.227

What it is not known of the effect of fat intake at breakfast on DIT.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Systematic literature review (SLR) to investigate effect of breakfast consumption on measures of REE amongst adults. This abstract reports one aspect of the review: effect of fat intake at breakfast on diet induced thermogenesis (DIT).

Methods:

SLR protocol was registered in Prospero. Inclusion criteria and keywords were chosen a priori. Databases searched were Cochrane, Cinahl, Embase, Medline. English-language intervention studies with healthy adults were included; no date limit applied. Inclusion criteria were applied by two reviewers. Quality of included papers was assessed by two reviewers using the Academy of Nutrition and Dietetics quality criteria checklist.

Results/findings:

Initial search identified 473 records; 34 remained once duplicates removed and inclusion and quality criteria applied. Data from five trials investigating role of dietary fat consumption at breakfast on DIT were extracted. All studies were in men and used indirect calorimetry. The five studies were heterogeneous in all aspects of study design, one was rated positive quality, the remainders were neutral. Two studies compared type of fat: the positive quality study was a randomized cross over trial (RCOD) of an isocaloric (2.5MJ) high MUFA vs high SFA breakfast which found no effect on DIT ($p=0.753$); another RCOD found a greater increase in DIT with breakfast containing 30g medium chain (5.31MJ) cf. long chain triglycerides (5.44MJ) ($p<0.05$). Three studies compared amount of fat at breakfast: a RCOD found no difference in DIT after 15 days low energy/moderate fat breakfast (418kJ) cf. high energy/low fat breakfast (2920kJ); a RCOD study found no difference between normal fat breakfast (25%TE) and high fat breakfast (25%TE + 50g fat) ($p=0.40$); a repeated measures study found greater increases in DIT with high CHO cf. high fat breakfast (both 2092kJ, $p<0.05$). Lack of consistency in study design meant no valid comparisons could be made.

Conclusions:

This SLR was unable to draw any conclusions about the effect of fat intake at breakfast on DIT, due to the heterogeneity of included trials. Further research with consistent study design and isocaloric comparisons are needed to determine if caloric value or type and quality of fat is an important determinant of DIT.

P1.228

Characteristics of young adults enrolling in a mobile-phone based healthy lifestyle program and their readiness to make healthy dietary changes

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Objective: Young adulthood is a vulnerable time for weight gain associated with unhealthy behaviours. Identifying the stage-of-change for different health behaviours allows tailored advice for effective transformation. This research examined young adult participant's readiness and perceived self-efficacy to make healthy changes.

Methods: Eighteen to 35 years-olds enrolling in a 9-month mobile phone-based randomised controlled trial completed an online questionnaire at baseline. Stage-of-change was determined with a validated algorithm using questions regarding their current dietary behavior and intention to change. Self-efficacy was assessed by asking how confident participants were they could achieve recommended eating behaviours. Chi-square analysis was used to assess gender differences in characteristics and nutrition behaviours.

Results: In total, 248 participants completed the questionnaire and the typical young adult who enrolled in this program was female (61%), overweight (60%) with a university qualification (62%) from the highest socio-economic quintile (75%), spoke English at home (69%), had a significant other (58%) and was living with others (89%). Compared to females, males were more likely to have a higher body-mass-index ($p<0.01$), higher income ($p<0.001$) and a significant other ($p<0.01$). The majority of this cohort did not meet the recommended fruit and vegetables intake (64% and 96%, respectively), 33% consumed more than two cups of sugar-sweetened beverages (SSB) per week and 62% consumed more than one takeaway per week. Males were more likely to consume more than two cups of SSB ($p<0.001$) and more than one takeaway per week ($p<0.05$). Overall, most participants were in "preparation" stage-of-change to meet fruit (49%) and vegetable (76%) recommendations and limit takeaways (47%), and in "maintenance" for limiting SSB (66%). Few participants were in "pre-contemplation" stage-of-change for meeting fruit (13%) and vegetable (16%) recommendations, and limiting SSB (2%) and takeaways (9%). Self-efficacy rating of "confident" or "very confident" in achieving the healthy recommendations was: fruit (75%), vegetables (53%), SSB (94%), takeaway (65%) and alcohol (67%).

Conclusion: An m-health healthy lifestyle program reached overweight well-educated young adults with poor dietary behaviours who were prepared and confident to make healthy changes.

P1.229

Using the multiphase optimization strategy (MOST) to develop an effective and scalable weight loss intervention

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SIG: Yes, e- & mHealth

Awards: No

Purpose: This presentation will introduce to the behavioral nutrition and physical activity research community a new methodological framework, the multiphase optimization strategy (MOST), for development, optimization, and evaluation of behavioral interventions. The classic approach to development of interventions has been to identify a set of components, form a treatment package, and evaluate this package by means of a randomized clinical trial (RCT). MOST, which has been inspired by principles in wide use in engineering, includes those steps, but inserts additional steps aimed at selecting components to form an optimized intervention BEFORE evaluation via an RCT. Interventions are optimized to meet specific criteria of effectiveness, efficiency, and/or scalability. An application of MOST currently in the field will be presented. In this application MOST is being used to engineer the most effective weight loss intervention that can be delivered, given the components under consideration, for an estimated cost not to exceed \$500 per participant.

Methods: The components being examined, all of which are hypothesized to impact key social cognitive mechanisms, are: coaching; text messages offering encouragement; communication with family physician; training provided to a “buddy,”; and meal replacements. In MOST, efficient randomized experimentation is conducted to estimate the main effect of each intervention component, and whether one component has an impact on the performance of another. We are using an innovative fractional factorial experimental design. Fractional factorial experiments are used widely in engineering because they are economical. Our design enables estimation of the main effect of each component and interactions between components in a single 16-condition experiment. Our planned N is 560, which we estimate is sufficient to provide power of at least .8 to detect effect sizes of $d = .25$.

Results/findings: We are approximately halfway through conducting the experiment; the design is intact with no serious disruptions.

Conclusions: MOST is practical, and will enable development of optimized interventions in behavioral nutrition and physical activity that are effective, efficient, and scalable.

P1.230

“A systematic review of the literature on the effects of lifestyle interventions on weight in overweight cancer survivors”

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SIG: Yes, Cancer Prevention and Management

Awards: No

Purpose:

Lifestyle interventions may reduce weight and positively affect physical and mental health in overweight cancer survivors. Currently, an overview of the effects of such interventions is lacking. The purpose of this study was to provide an overview of the effect of lifestyle interventions on weight in overweight cancer survivors.

Methods:

A systematic review of the literature was conducted. Six databases (PubMed, Embase, Psycinfo, Web of Science, Cinahl, and Central) were searched for relevant papers. We included original research articles describing the results of a lifestyle intervention (including a diet component) in adult (≥ 18 years) overweight (BMI ≥ 25) cancer survivors (i.e. individuals diagnosed with cancer) after completion of active treatment (i.e., surgery, chemotherapy, radiotherapy). Non-English literature was excluded. Two researchers independently screened the retrieved papers. World Cancer Research Fund (WCRF) criteria for grading evidence were used to describe the level of scientific evidence.

Findings:

After removal of duplicates ($n=2396$), 4197 references were screened. In total, 22 papers, describing 19 interventions were included. Interventions were implemented in breast ($n=15$), endometrial ($n=2$), colorectal ($n=1$), and colorectal, breast and prostate cancer survivors ($n=1$). The number of participants varied from 10 to 1510, but was relatively low ($n < 50$) in the majority of the studies ($n=13$). Most interventions incorporated both a diet and a physical activity component. Duration of the interventions varied from 8 weeks to 18 months. Intervention effects were assessed using randomized controlled trials ($n=11$) or single arm pre-post test designs ($n=8$). Nine papers described feasibility or pilot studies. Effects were mostly assessed directly after the end of the intervention ($n=15$), although 7 post-intervention follow-up measurements were reported (mostly after 6 months). In 17 out of 19 interventions a significant intervention effect on weight was found, with weight loss in the intervention group varying from 1.18 to 12.5 kg.

Conclusions:

According to WCRF-criteria, there is limited-suggestive evidence for a short-term intervention effect on weight-loss in overweight cancer survivors. No conclusions can be drawn with regard to long-term effectiveness. Future larger randomized controlled trials with longer follow-up periods are needed to be able to assess long-term intervention effects.

P1.231

Decision-makers' perspectives on the acceptability of a "Health-At-Every-Size" program in health and social services centers in Québec

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The government is investing resources to facilitate the implementation of an evidence-based "Health-At-Every-Size" (HAES) program among Health and Social Services Centers (HSSC) in Québec, Canada. Only 41 out of 95 HSSC offer the program which questions the program's acceptability. This study's purpose is to assess to what extent the HAES program is acceptable from the perspective of HSSC decision-makers and to document the factors explaining their decision to adopt the program or not.

Methods: A qualitative method using 1-hour telephone interview with a standardized open-ended interviewer guide was used to collect data among decision-makers who decided to offer the program (n=25) or not (n=13). Study questions were developed to explore the factors affecting implementation (Durlak et al., 2008). Some questions were based on previous data collected by the non-governmental organization in charge of disseminating the program. NVivo was used to assist in inductive thematic analysis of the verbatim based on conceptual frameworks from the literature on program implementation.

Results: Transcripts revealed that both decision-makers that had implemented the program and those that had not, found the program interesting and believed that it had significant psychological and physical impacts for participants. According to decision-makers interviews, decision to implement or not depended largely on access to human and financial resources. Specific organizational factors such as high rates of personnel turnover, a rigid or unstable organizational structure or a large HSSC territory making weekly group meeting for 14 weeks a challenge were also mentioned as influential. Finally, many decision-makers suggested that the program would benefit from more flexibility for example, in order to adapt to local context, to allow local training of program leaders, and to let other professionals than dietitians or social workers lead the program.

Conclusions: Scaling up of programs without threatening their effectiveness remains a challenge. Findings suggest that decision-makers would benefit from assistance in identifying recurrent funding to support the program in their organization. Findings also challenge the non-governmental organization responsible for the program to identify zones of flexibility to ensure greater dissemination.

P1.232

Evaluating complex population health interventions: The Healthy Kids Community Challenge in Ontario, Canada

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SIG: Yes, Policies and environments

Awards: No

Purpose: Population health interventions are required to combat the increasing prevalence of childhood overweight and obesity. To be successful, interventions should address inequities associated with the underlying conditions that shape opportunities for health. Population-level interventions require direct engagement with children and youth, their parents, families, and the communities in which they live, play, attend school, and sleep. Effective evaluations of such interventions require attention at each of these levels.

This presentation will describe the evaluation of a complex community-based population health intervention using Ontario's Healthy Kids Community Challenge (HKCC) as a case study. The HKCC is a three year intervention that combines a centrally developed social marketing campaign, with community-based initiatives in 45 communities across Ontario to target childhood overweight and obesity. The *objectives* of this presentation are: 1) to provide an overview of the key evaluation components, and 2) to address the extent to which the evaluation may adapt over the course of the intervention.

Methods: The HKCC evaluation adopts a quasi-experimental pre/post design, integrating mixed methods approach. The evaluation occurs over the three-year intervention period, and consists of two central components. The *outcome evaluation* measures the impact of the intervention: short-term (e.g., child and parent knowledge about healthy behaviours), mid-term (e.g., parent support behaviours), and long-term (child healthy weights) outcomes. The *process evaluation* examines the degree to which the intervention has been implemented as planned through reach, adoption, implementation and maintenance in order to identify the context and mechanisms shaping implementation.

Results: The development of tools and evaluation activities to assess these components will be presented, as well as methodological challenges faced by the evaluation team. Consideration will be given to the standardization of intervention application, sensitivity to local contexts, and the difficulty in attributing outcomes to the intervention.

Conclusions: The evaluation of a multi-site intervention that involves multiple stakeholders operating at various levels is inherently complex. Discussion will focus on the feasibility of outcome and process evaluations in this context, the rationale for the primary data collection tools, and the involvement of HKCC communities in the evaluation.

P1.233

Relationship between mechanisms of stress, energy homeostasis and insulin resistance in European adolescents - the HELENA study

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: Stress is hypothesized to facilitate the development of obesity, from which the foundations are already set during childhood and adolescence. We investigated the relationship between the stress-system, selected mechanisms of energy homeostasis and insulin resistance (IR) in a sample of European adolescents.

Methods: Within HELENA-CSS, 723 adolescents (12.5 to 17.5 years) from 10 European cities provided all necessary data for this study. Fasting blood samples were collected for cortisol, leptin, insulin and glucose analysis. HOMA-IR was calculated from insulin and glucose concentrations. Adolescents' body fat (BF) %, age and duration of exclusive breastfeeding were assessed. For boys and girls separately, the relationship of cortisol with leptin, insulin, glucose and HOMA-IR was examined by computing Pearson correlation coefficients and Hierarchical Linear Models (HLMs), with 'city' as cluster unit, adjusting for age, BF% and duration of exclusive breastfeeding.

Results: In boys, Pearson correlation coefficients illustrated positive correlations of cortisol with insulin ($r=0.144$; $p=0.013$), glucose ($r=0.315$; $p<0.001$) and HOMA-IR ($r=0.180$; $p=0.002$), whilst in girls, this positive relationship was observed for leptin ($r=0.147$; $p=0.002$), insulin ($r=0.095$; $p=0.050$) and HOMA-IR ($r=0.099$; $p=0.041$), but not for glucose ($r=0.054$; $p=0.265$). Observed associations were independent of adolescents' age, BF% and duration of exclusive breastfeeding after computing HLMs.

Conclusions: This study suggests that the stress-system is positively related to mechanisms of energy homeostasis and IR in European adolescents, and reveals a potential small gender difference in this relationship. The hypothesis that stress might facilitate the development of obesity during adolescence is supported.

P2.1

Measures of the food environment of young people: linking individual eating behaviour to the environmental context in the North East of England

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SIG: Yes, Policies and environments

Awards: No

Objective:

Several environmental factors drive food choice. The aim of this work was to identify and characterise the food environments from which a sample of 16-22 year olds in North East England obtain food. This research aimed to explore associations between type of food environment and intakes of nutrients, fruit and vegetables.

Methods:

Across two studies, a total of 86 respondents (mean age 17 years) reported in 4-day food diaries what food they consumed and where the food was sourced. Portion size was assessed in face-to-face interviews using an age-specific photographic food atlas. The nutrient composition of each food was estimated using the UK food composition tables, total weights of fruits and vegetables consumed were calculated from weight of items. Food items sourced out-of-home were classified using a food environment classification tool[1]. The tool contained 15 classification categories with 88 detailed classification sub-levels.

Results:

Over a four-day period, respondents sourced food from an average of 3.3 out-of-home food environments on at least one occasion. All obtained food from their home every day making home quantitatively the most important food source. The largest proportion (by weight) of food consumed was from home and this food was more favourable in terms of health profile than out-of-home food. Foods sourced from specialist outlets, convenience stores and retail bakers had the highest energy density. Foods consumed from retail bakers and 'takeaway and fast food' outlets were the richest sources of fat while foods sourced from convenience stores and non-food stores had the highest percentage of energy from sugar.

Conclusions:

For the first time, this work provides details of where young people obtain food and the nutritional consequences of choosing those food environments.

[1] Lake, A. A., Burgoine, T., Greenhalgh, F., Stamp, E., & Tyrrell, R. (2010). The Foodscape: classification and field validation of secondary data sources. *Health & Place*, 16 666-673.

P2.2

Measurement and description of food environments: an audit of food outlets at tertiary education settings in Australia.

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Food environments affect an individual's food selection, yet there are no standardised audit tools to analyse the nature of different settings. As young adults are considered to be an age group likely to be influenced by their surroundings, food environments within tertiary education settings need to be reviewed in order to determine possible connections between food environment and weight gain, during this transitional stage of life. This study aimed to measure the food environment of different tertiary education settings such as universities and technical and further education institutions (TAFEs) to gain insight into what young adults are exposed to on campus and identify important factors within the food environment that require intervention. An audit tool was developed, piloted, refined and utilized to analyse all food outlets and vending machines on three university and three TAFE campuses. Information was collated on the availability, accessibility and promotion of foods and beverages and a composite total score (maximum score = 148) was calculated. On average, the most frequently available items were chips and extruded snacks (10%), high energy (>600 kilojoules) foods (10%), sugar-sweetened soft drinks (20%), chocolates (12%) and confectionery (10%). Healthy food and beverages were observed to be less available, accessible and promoted than unhealthy options. Following this audit, every outlet on each campus was ranked and categorized into groups based on their 'healthiness'. The median food environment score across all six outlets was 70.2 (IQR = 7). The audit tool proved useful in measuring the food environment, determining the need to decrease availability, accessibility and promotion of unhealthy items to foster better food selection among young adults. The data suggests that the tertiary education food environment has substantial potential to affect the food selection of young adults, exposed to this setting. This implicates the potential for policy and interventions to be introduced focusing on these areas of the food environment.

P2.3

Sustenance and Sustainability: Maximizing the impact of School Gardens on Health Outcomes

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SIG: Yes, Children and families

Awards:

Purpose: School garden-based programs are increasingly prevalent health promotion initiatives in many countries. Although many of these programs have assessed impacts on dietary intake and related dietary behaviors such as knowledge, preference, motivation, intention and self-efficacy, some studies are now focusing on metabolic and other health-related outcomes. This study reviews current evidence for the premise that school garden-based interventions enhance diet-related behaviours and health/metabolic outcomes, and highlights components of these garden-based programs that are critical to success.

Methods: Medline and Embase were interrogated for school garden-based interventions. Studies were eligible if they were: a) English language; b) taught in school settings; c) included a school garden component; and d) had a baseline and post-intervention dietary behaviour. This review includes at least 15 studies that have examined the impact of garden-based programs conducted in school, either during school hours or after-school settings, on dietary behaviors in children (age 4-13 years).

Results: Three of the reviewed studies were ecological and simply evaluated within group changes after a garden intervention. Of the 11 quasi-experimental programs examining dietary intake, six found increased vegetable intake, and four showed no effect. Seven of the eight studies that investigated preference found an increase in preference for vegetables. Other effects included improved attitudes towards, willingness to taste, identification of and self-efficacy to prepare/cook FV. One non-randomised controlled trial showed beneficial effects on blood pressure and body size. A cluster-randomised controlled trial found enhanced knowledge and attitudes towards vegetables and fruits. Common, and possibly critical, strategies/components of the programs included: "hands on" curriculum (ie. planting, caring for, and harvesting produce), incorporation of cooking activities/lessons, providing specialised instructors, parental and stakeholder involvement and support, food provision, and using the garden as the focal point for media promotion.

Conclusions: The present review shows clear and consistent effects of school-based gardening programs on improving dietary behaviors, especially linked to increases in vegetable and fruit intake. Future research directions should include more erudite study designs and movement towards understanding how to achieve long-term improvements in dietary behaviors and how to sustain garden-based programs in schools.

P2.4

Food Insecurity: Benefits, barriers and behaviors around school breakfast among rural adolescents.

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SIG: Yes, Policies and environments

Awards: No

Objective: The purpose of the study is to determine the ways in which food insecurity influences breakfast behaviors and perceptions of school-oriented barriers and benefits of eating breakfast. Using data from project BreakFast, we examine if the availability of and access to school breakfast may be key to equalizing the school experience among a racially and economically diverse rural high school population.

Methods: The participants were 758 adolescents from Minnesota, USA attending one of 15 rural high schools. This cross-sectional analysis uses baseline data from a group randomized trial aimed at increasing school breakfast participation through policy and environmental-level school changes. Students completed an online survey asking about demographics, food security, breakfast eating behaviors, and the barriers and benefits eating breakfast plays on school performance. Height and weight were measured by trained staff. Scales of breakfast beliefs, barriers and benefits were created by summing item responses. Bivariate analysis (Chi-square tests and two-sample t tests) and simple and multivariate linear regression, accounting for clustering by school, was performed using Statistical Analysis Software (version 9.3, SAS Institute Inc., Cary, NC). A two-sided p-value < 0.05 was considered statistically significant.

Results: The participants were 9th (48%) and 10th grade students, 35% free/reduced price lunch, 31% non-white, 55% female, and 36% overweight/obese. Fourteen percent reported food insecurity. Bivariate analysis revealed that food insecure students were more likely non-white, female, had higher participation in school breakfast program, ate breakfast more days at school, reported more benefits to school-related performance and marginally reported fewer barriers than non-food insecure participants. Adjusted (demographics, weight, attendance rate) linear regression models confirmed that food insecure participants ate breakfast at school more days (coeff=0.37 (SE:0.15), p=0.01) and a higher percentage of school breakfast participation (coeff=3.86 (SE:1.74), p=0.03) than food secure participants. Food insecure participants reported fewer barriers (coeff=-0.95 (SE:0.40), p=0.02) than food secure participants. Perceived benefits were not statistically different in adjusted models.

Conclusions: Food insecure adolescents do participate in school breakfast more than non-food insecure adolescents and report fewer barriers to participation. Accessible school breakfast programs are an important resource in rural schools as a means of reducing hunger among adolescents.

P2.5

Feasibility of Assessing the Healthfulness of the Food Shelf Environment and Lessons Learned

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: It is important that food shelves provide healthy foods to customers due to increased risk of chronic diseases with poor nutrition. The purpose of this research is to assess the feasibility of applying a nutritional scoring tool, the Healthy Eating Index-2010 (HEI-2010), in food shelves. The HEI-2010 aligns with the Dietary Guidelines for Americans and focuses on 12 food components. Each food component category is given a weighted score, and sums up to 100 providing a total HEI-2010 score.

Methods: Invoices from food shelves food orders from two Minnesota, U.S food banks were collected from January to December, 2013. Foods on invoices were matched to food descriptions in a nutrient database to determine the amount of nutrient components. Publicly available United States Department of Agriculture (USDA) SAS code was used to calculate the HEI-2010.

Results: A total of 372 food shelves were included in the population, 66.2% were located in urban areas and 33.8% in rural/small towns. Of the shelves that reported pounds distributed (n=364), 90.11% were small (0-499,999 lbs. distributed) 6.87% medium (500,000-999,999 lbs.) and 3.02% large (>1,000,000 lbs.). "Miscellaneous" foods (e.g., unidentified produce) could not be matched to food descriptions and therefore were not scored. Food shelves that ordered only miscellaneous foods were not given an HEI-2010. The HEI-2010 was applied to 274 food shelves. The total HEI-2010 score mean was 62.4 and ranged from 28 to 82 points. 2.19% of food shelves scored "good" (>80), 89.05% "needs improvement" (50-80) and 8.76% "needs substantial improvement" (<50). Food Shelves scored best in food component category "total protein". Component scores needing most improvement were dairy, whole grains and total fruit. HEI scores were higher during summer/early fall months, indicating seasonality.

Conclusions: Our work uniquely applies the HEI-2010 to food shelf invoices to assess the healthfulness of food shelves. Application of the HEI-2010 in food shelves is feasible, but has some limitations. Our results indicate that there is room for improvement in the healthfulness of foods purchased by food shelves. Lessons learned and future needs in applying the HEI-2010 in the emergency food setting will be discussed.

P2.7

Perceptions of stakeholders on intersectoral actions to promote nutrition: A qualitative study

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

The need for intersectoral- collaboration is highlighted in international guidelines. There are several projects in Sri Lanka to promote collaboration between sectors involved in nutrition and health. However, there is a lack of Sri Lankan literature on the effectiveness of intersectoral collaboration for health promotion, particularly in relation to diet. Our aim is to explore the knowledge, practices, beliefs and attitudes on intersectoral collaboration for nutrition promotion among stakeholders in Sri Lanka.

Methods:

We used key informant sampling to recruit persons responsible for intersectoral collaboration or nutrition promotion in government and non-government institutions identified as important in nutrition promotion by the Sri Lanka District Nutrition Action Plan. Participants were invited to complete semi-structured interviews on the perceptions of intersectoral collaboration. Interviews were completed with 15 participants from 12 institutions by trained interviewers. Each interview lasted 30-45 minutes, and all were transcribed for analysis in NVivo. Analysis identified key themes and recommendations for successful intersectoral collaboration in nutrition promotion.

Results:

The main themes identified included role clarification, implementation and evaluation, communication gaps, attitude towards collaboration and training and development. Many sectors recognized the Ministry of Health as the lead on nutrition related activities in the country. It was felt that within organizations, decisions were made at the top level with limited consultation of the grass root level officers, who receive instructions but contribute minimally to decision making. Participants recognized that duties and activities are being identified for each sector, but that few are recognised as objectives of non-health sectors. Additionally even though there is a good existing local government structure for different sectors, with opportunities for collaboration, a lack of knowledge on this among officers limits collaboration.

Conclusions:

The health sector should provide support for nutrition promotion activities that are led by non-health sector institutions. Financial planning and necessary technical inputs should be provided to all sectors involved in multisectoral collaboration. Collaboration should be monitored and evaluated from the implementation stage with this cross-communicated to all sectors. This should include the identification of indicators that can measure the contribution of sectors in promoting nutrition.

P2.8

The Food Dudes Dining Experience: Transforming Food Environments in Primary Schools and Increasing School Meal Quality and Uptake.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Context: Healthy foods including fruit and vegetables are available to most UK children in school dining rooms but they are often ignored, perceived as uncool and left uneaten. Food Dudes Dining Experience, a comprehensive behaviour change intervention designed to improve school food environment and healthy food consumption, was trialed in collaboration with Bolton Council School Caterers.

Objectives: We predicted that combining an intervention that provides demand for healthy foods and attractive branding of fruit and veg (the Food Dudes Programme) with an intervention that makes choosing healthy foods easy and appealing to the children (the Food Dudes Dining Experience) would substantially change children's consumption of fruit, vegetables, and foods high in fat, salt and sugar.

Methods: In a controlled trial, primary school children took part in either a full Food Dudes Programme that included a Dining Experience intervention, or a reduced Programme that did not significantly change school food environment. Key evaluation measures included direct observation of children's consumption at school; parental questionnaires as a measure of generalisation to home; and caterer and school records to assess changes in school meal provision and uptake.

Results: We recorded substantial improvements in children's consumption of fruit and vegetables, and a significant decrease in their consumption of foods high in fat, salt and sugar. The biggest effects were obtained in intervention schools on Special Energy Days, when additional fruit and vegetable choices were made available through the improved school menu.

Conclusions: Food Dudes Dining Experience can help to change children's eating for the better, and to sustain these changes over time. The winner of a prestigious Catering Awards, this programme had been commissioned by Department of Education to increase school meals quality and uptake. To do this, we are now working in collaboration with Child Food Trust.

P2.9

Bridging the gap between nutrition research and food policy action for cancer prevention

Kathy Chapman
Cancer Council NSW, New South Wales, Australia

SIG: Yes, Cancer Prevention and Management

Awards: No

Objective: To make progress in cancer prevention, we need to embrace strategies that focus on policy change with the potential to reach and impact on greater numbers in the community. Food policy issues, such as labelling and marketing, continue to be a focus for governments, public health groups and food industry. This presentation will outline how policy relevant research in obesity prevention can be used to support policy action such as that described by the NOURISHING framework (<http://www.wcrf.org/nourishing>)

Methods: Advocacy groups such as cancer organisations have an important role to play in influencing policy, regulation and even industry practices by undertaking strategic research on food labelling and marketing issues, in order to influence key decision-makers. This strategic research can also harness community support by maintaining food policy issues on the public agenda through media debate.

The presentation will describe three research studies (consumer understanding of front of pack labelling schemes, kilojoule labelling in fast food restaurants, and nutrition and health claims used on food labels) as case studies of how research been used to mobilise public discussion.

Results: Cancer Council NSW has used the results of research to support the evidence base in public health advocacy efforts to develop a voluntary front-of-pack labelling scheme (Health Star Rating) which has now been introduced across Australia. Results of studies in fast food restaurants have highlighted the limitations of current kilojoule labelling in these outlets provoking discussion on the need for additional interventions in this sector such as marketing restrictions and reformulation of fast food items. These findings have been promoted in media and presented to relevant government agencies; enhancing advocacy efforts of a number of public health organisations, and providing a platform to examine how to strengthen existing regulations. Research results on nutrition and health claims on food labels have been widely communicated in the media generating public debate around misleading food labelling. Cancer Council has also created a 'Health Claims Watchdog' with public health colleagues to scrutinise health claims regulation.

Conclusions: Cancer organisations can undertake and utilise policy-relevant strategic research through advocacy and communication channels to influence policy action including regulation.

P2.10

Zoning to support farmers' markets in rural and urban communities

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SIG: Yes, Policies and environments

Awards: No

Purpose: In our formative work in North Carolina (southeastern U.S.), we learned that obesity-prevention strategies related to promoting fruits and vegetables from local farms was a winnable strategy. Therefore, we examined (1) associations between county-level zoning to support farmers' markets and county-level farmers' market availability, as well as county-level socio-demographic factors and (2) individual-level associations between zoning to support farmers' markets; fruit and vegetable consumption and body mass index (BMI) among a random sample of North Carolina (NC) residents.

Methods:

Design: Cross-sectional analysis at the county and individual levels.

Participants: Randomly selected residents (n = 615) of three urban and three rural NC counties.

Measures: Zoning ordinances in 33 representative NC Counties were scored to indicate supportiveness for healthy food outlets («Healthy Outlet Zoning Score»). Number of farmers' markets per county was obtained from a Fruit and Vegetable Outlet Inventory (2013). County-level socio-demographic factors were obtained from Census data. For data on fruit and vegetable consumption and BMI, trained interviewers conducted a random digit dial telephone survey of residents of six NC counties.

Analysis: Pearson correlation coefficients and multilevel linear regression models.

Results: There was a moderate inverse association between Healthy Outlet Zoning Score and urban influence codes that approached statistical significance-indicating healthier food zoning in more urban areas ($r = -0.333$, $p = 0.058$). There was an inverse association between Healthy Outlet Zoning Score and percent poverty-indicating healthier food zoning in areas with less poverty ($r = -0.381$, $p = 0.029$). Self-reported fruit and vegetable consumption was positively associated with the Healthy Outlet Zoning Score ($b = 5.42$, $p = 0.02$).

Conclusions: Zoning to support farmers' markets and number of farmers' markets per county were not associated. This may be due to the lag time between zoning ordinance adoption and translation into actual changes in the community food environment, or due to variation in the ways individual municipalities act upon zoning ordinances. Our results indicated healthier food zoning in more urban areas and in areas with less poverty, perhaps because these areas are more likely to have resources to support healthy zoning.

P2.12

A Mixed-Method Approach to Understanding Components of Child Self-regulation and Their Relationship to Childhood Obesity

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SIG: Yes, Children and families

Awards: No

Purpose: The purpose of this study was to examine relationships among parent-report and observations of various types of child self-regulation (executive functioning, emotion regulation, and child eating self-regulation) in a low-income sample of Hispanic families. We also examined the relationship of these constructs to child weight status.

Methods: Low-income Hispanic families with preschoolers were recruited from Head Start districts in a large urban city in the U.S. The Eating in the Absence of Hunger task (EAH) as well as parent-report of child satiety responsiveness and food responsiveness were used to assess child eating self-regulation. Two laboratory tasks assessed executive functioning; a parent questionnaire assessed effortful control (a temperament dimension related to executive functioning); and the delay of gratification and gift delay tasks assessed emotion regulation - all aspects of child self-regulation. Bivariate correlations were run among all variables in the study. Hierarchical linear regression analyses were run to predict: 1) child eating self-regulation measures from the demographic, executive functioning, effortful control, and emotion regulation measures; and 2) child BMI z-scores from the executive functioning, effortful control, emotion regulation, and eating self-regulation measures.

Results: Within child eating self-regulation, only the two parent-report measures were related. Neither of these child eating self-regulation measures based on parent-report were associated with the observed eating self-regulation task (EAH). Low to moderate positive correlations were found between measures of executive functioning, effortful control, and emotion regulation. Only three relationships were found between eating regulation and other forms of self-regulation: children's delay of gratification was positively associated with eating in the absence of hunger, and poor regulation on the gift delay task was associated positively with maternal reports of food responsiveness and negatively with maternal reports of satiety responsiveness. Regression analyses showed that child eating self-regulation was associated with child weight status but other forms of self-regulation were not.

Conclusions: Implications for understanding different components of child self-regulation, their relationship to one another, their assessment by different methods, and their relationship to childhood obesity are discussed.

P2.13

Food liking, intake and fussy eating: Relationship with early exposure to fruits, vegetables and noncore foods

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SIG: Yes, Early care and education

Awards: No

Objective: The present study examined whether the number of fruits, vegetables and noncore foods tried at 14 months was related to 3-4 year old children's liking and intake of these foods, food fussiness and measured child weight status.

Methods: This study reports secondary analyses of longitudinal data from mothers and children (n = 340) participating in the NOURISH RCT.[1] Exposure was quantified as the number of food items (n = 55) 'tried' by a child from specified lists at 14 months. At 3.7 years food liking, intake patterns and fussiness were assessed using maternal-completed established questionnaires. Child weight and length/height were measured by study staff at both ages. Multivariable linear regression models tested the associations between number of foods tried at 14 months and number of foods liked, intake patterns, fussy eating and BMI Z score at 3.7 years adjusting for a range of maternal and child covariates.

Results: Exposure at 14 months to a wider variety of vegetables, fruits and noncore foods was positively associated with number of these foods liked and intake at 3.7 years. Adjusting for fussiness at 14 months, exposure to more vegetables was associated with lower fussiness at 3.7 years. Exposure was not associated with BMI Z score.

Conclusion: These analyses are consistent with the hypothesis that early taste and texture experiences may influence subsequent food preferences and acceptance. These findings suggest introduction to a variety of fruits and vegetables and limited noncore food exposure from an early age are important strategies to improve later diet quality.

P2.14

Consumer support for healthy food and drink vending machines in public places

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: Vending machines located in public places are typically stocked with energy-dense, nutrient poor snacks and sugary drinks, and positioned where there are limited alternative food outlets. Changes to the vending machine food environment, including making healthier options available, displaying health promotion messages at the point-of-purchase, and price incentives may encourage healthier purchasing behaviours. This study aimed to investigate consumers' interest in healthier products and the influence of front-of-pack labelling formats for vending machines.

Method: Surveys were conducted with 120 university students and 120 hospital employees, patients and visitors. Survey questions explored previous vending machine use, attitudes towards current and alternative healthier products, and price attitudes. Two front-of-pack labelling systems - Traffic Light labelling and a USA 3-star system - were also tested for their ability to guide consumer choice in five product pair comparisons.

Results: The vast majority (87.5%) of participants identified the current range of snack foods as too unhealthy, and 56.7% identified the current range of drinks as too unhealthy. Nuts, muesli bars and dried fruit were the most liked healthier vending machine snack. Health/nutrition, taste and convenience were important motivations for potential purchase of healthier products. Higher proportions of participants were able to identify the healthier snack in three of the five product comparisons when products were accompanied with any type of front-of-pack label (all $p < 0.01$; Pearson's chi-squared); however participants were less likely to be able to correctly identify the healthier product in the drinks comparison when a front-of-pack guide was present (10.8% point lower, $p = 0.004$).

Conclusions: These results show that respondents were interested in a range of healthier snack foods for vending machines, and that front-of-pack label formats on vending machines may assist consumers to identify healthier products. This study supports the modification of vending machine food environments in public places such as universities and hospitals through the introduction of healthier foods and drinks, and making nutritional labelling visible at the point-of-purchase.

P2.15

Differential influence of paternal, maternal and household social factors on dietary patterns in early childhood: longitudinal results from the French EDEN mother-child cohort

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: The association between socioeconomic position (SEP) and diet in early childhood has mainly been addressed based on maternal education and household income. We aimed to assess the influence of a variety of dimensions of SEP, including paternal factors, on dietary patterns identified from 2 to 5 y.

Method: This study included 974 children from the French EDEN mother-child cohort. Two multi-time-point dietary patterns were derived in a previous study: they corresponded to consistent exposures to either core- or non-core foods across 2, 3 and 5 y and were labelled "Guidelines" and "Processed, fast-foods". The independent influence of various paternal, maternal and household factors collected during pregnancy (age, education level) or at 2-y follow-up (marital status, occupation, work commitments, household financial disadvantage, presence of older siblings and childcare arrangements) was assessed by multivariable linear regression analysis.

Results: Different social factors influenced each of the dietary patterns. The adherence to a diet close to "Guidelines" was positively and independently influenced by both maternal (education) and paternal (education, occupation) factors. The adherence to a diet consistently composed of processed and fast-foods was essentially determined by maternal variables (younger age and lower education level), household financial disadvantage, the presence of older sibling(s) and being cared after at home by somebody else than the mother.

Conclusions: These findings confirmed the major influence of maternal education regarding early dietary patterns. They also highlighted that beyond household financial disadvantage, the social environment of the child (family structure and functioning) contributes to the orientation of the diet towards non-core foods. The child adherence to a healthy diet on a regular basis appears to result from paternal as well as maternal influences, which suggests that fathers also play an important role in the setting of healthy dietary trajectories in their child, the mechanisms of which need to be further determined.

P2.16

Prevalence and socio-demographic correlates of cooking skills in UK adults: cross-sectional analysis of data from the UK National Diet and Nutrition Survey

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SIG: Yes, Socioeconomic inequalities

Awards: No

Background & purpose:

Poor cooking skills may be a barrier to healthy eating and a contributor to overweight and obesity. Little population-representative data on adult cooking skills has been published. We explored prevalence and socio-demographic correlates of cooking skills among adult respondents to wave 1 of the UK National Diet and Nutrition Survey (2008-9).

Methods:

Socio-demographic variables of interest were sex, age group, occupational socio-economic group and whether or not respondents had the main responsibility for food in their households. Cooking skills were assessed as self-reported confidence in using eight cooking techniques, confidence in cooking ten foods, and ability to prepare four types of dish (convenience foods, a complete meal from ready-made ingredients, a main meal from basic ingredients, and cake or biscuits from basic ingredients). Frequency of preparation of main meals was also reported.

Results:

Of 509 participants, almost two-thirds reported cooking a main meal at least five times per week. Around 90% reported being able to cook convenience foods, a complete meal from ready-made ingredient, and a main dish from basic ingredients without help. Socio-demographic differences in all markers of cooking skills were scattered and inconsistent. Where these were found, women and main food providers were most likely to report confidence with foods, techniques or dishes, and those in the youngest age (19-34 years) and lowest socio-economic group least likely.

Conclusions:

This is the only exploration of the prevalence and socio-demographic correlates of adult cooking skills using recent and population-representative UK data. Reported confidence with using most cooking techniques and preparing most foods was high. There were few socio-demographic differences in reported cooking skills. Adult cooking skills interventions are unlikely to have a large population impact, but may have important individual effects if clearly targeted at: men, younger adults, and those in the least affluent social groups.

P2.17

Extending the validity of the Feeding Practices and Structure Questionnaire

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: The Feeding Practices and Structure Questionnaire (FPSQ) is a tool designed to measure early feeding practices related to non-responsive feeding and structure of the meal environment. Face validity, factorial validity, internal reliability and cross-sectional correlations with children's eating behaviours have been established in mothers with 2-year-old children[1]. Given the general lack of thorough reliability and validity testing of early feeding measures, the purpose of this study was to extend the validity testing of the FPSQ by evaluating its factorial and predictive validity, sensitivity to change and stability.

Methods: Participants were from of the NOURISH randomised controlled trial[2] which evaluated an intervention with first-time mothers designed to promote protective feeding practices. Maternal feeding practices (FP) and child eating behaviours (EB) were assessed at child age 2 years and 3.5-4 years (n=349). Confirmatory Factor Analysis, t-tests (i.e. intervention vs. control), hierarchical multiple regression analyses adjusted for a range of covariates (EB: dependent variable), and correlations between both ages were conducted.

Results: The original 9-factor structure of the FPSQ was confirmed at child age 3.7±0.3 years. Group differences reflected behaviour consistent with intervention content and all FP were stable across both time points. There was some evidence for the predictive validity of factors with 2 FP showing expected relationships, 2 FP showing expected and unexpected relationships and 5 FP showing no relationship with EB.

Conclusions: This study highlights the utility of conducting multiple reliability and validity testing of FP measures prior to use. Findings support usage of the FPSQ in the preschool years.

References

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P2.18

The role of NGO advocacy in the development of England's salt reduction policies - what can we learn?

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Introduction: Salt has been a key government policy in England for over 15 years. NGO advocacy seeking to protect the public interest is widely recognised as having played a key role in influencing these policies (1-3). Building on previous research documenting the salt policy process, this work specifically explores the role and impact of the collective NGO advocacy, with the view of identifying key learning's to inform advocacy on other policy issues.

Methods: The NGOs examined were Consensus Action on Salt and Health, Which?, British Heart Foundation, Sustain and UK Health Forum. Relevant information from websites, publications, annual reviews/reports and consultation responses was extracted and verified for completeness by emailing each NGO (Oct-Dec 2014).

Results: Three common mechanisms of policy engagement were identified: (i) 'inside' advocacy, reflecting formal policy mechanisms and invitations for engagement, such as responding to consultations, participating in parliamentary hearings and acting as experts advisors (ii) 'outside' advocacy focused around challenging policies and exposing poor practice, commonly coupled with media activity (iii) Consumer awareness activities, such as health promotion campaigns and resource development. NGOs were found work both independently and in conjunction with each other, for instance through joint statements and reports.

NGO evaluation of the effectiveness of this engagement was based on (i) process based indicators, for instance the number of reports written or media coverage received, or (ii) long-term impact indicators such as policy adoption or reduced population salt intake. Missing from the evaluations however was a set of progress indicators which assess the steps and progression made towards the end goal. Such indicators are required for identifying which activities, or group of activities, has had the most impact so as to inform future NGO advocacy work.

Conclusions: NGOs were found to engage in England's salt policy through a mixture of inside, outside and awareness raising activities. While some evidence exists for its effectiveness, more work is required to develop progress indicators for NGO advocacy to help better identify the effectiveness and in turn help inform and streamline NGO advocacy on other nutrition policies.

References

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P2.19

Dietary iron intake in infancy is not associated with non-verbal intelligence at age 6 after controlling for socioeconomic status and maternal IQ: the Generation R Study.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Research suggests that dietary iron deficiency early in life potentially influences later cognitive functioning in children. However, few studies investigated the effects of normal-range iron intake on subsequent cognitive development in children. The aim of the present study was to investigate the long-term effect of normal-range iron intake in infancy on non-verbal intelligence at age six, controlling for multiple socioeconomic factors and maternal IQ, in 1819 children participating in a large population-based cohort, The Generation R Study.

Methods: Dietary iron intake (mg/d) at the age of 14 months was measured by Food Frequency Questionnaire, filled out by the mother. Values were adjusted for total energy-intake. Child intelligence score at age six was obtained by the Snijders-Oomen Niet-verbale intelligentie Test -Revisie, a Dutch non-verbal intelligence test suited for children aged 2.5-7. Associations were investigated by means of multiple linear regression analyses. Analyses were adjusted for potential confounders.

Results: Mean (SD) iron intake was 11.76 (4.71). Iron intake predicted later child non-verbal IQ ($B: 0.89$; 95%CI: 0.09, 1.69; $p=.028$) in the unadjusted model. However, after adjustment for several socioeconomic factors and maternal IQ the effect was attenuated substantially ($B: 0.42$; 95%CI: -0.47, 1.31; $p=.354$).

Conclusions: Our results suggest that in a developed country, when dietary iron intake is within normal range, variations in iron intake do not affect later child non-verbal intelligence beyond the influence of socioeconomic factors such as household income, maternal education and maternal intelligence.

P2.20

"TAKEAWAYS ARE NOT THE ENEMY": A QUALITATIVE STUDY OF INTERVENTION DELIVERERS' EXPERIENCE WITH OUT-OF-HOME FOOD OUTLETS (TRANSFORMING THE FOODSCAPE STUDY)

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose

Food from restaurants, takeaways and other out-of-home food outlets (OHFOs) tends to be high in energy and fat. Thus OHFOs are potential targets for interventions to tackle obesity. Some UK national fast-food chains have engaged with the Department of Health's 'Public Health Responsibility Deal' to promote healthier food, but it has been left to local government to develop interventions targeting independent OHFOs.

An appreciation of intervention delivery context is important to assess the practicality, feasibility and acceptability of potential interventions.

We sought to elicit the views of professionals who had developed/delivered interventions that aimed to provide healthier food within OHFOs. Findings from this work will inform development of interventions to improve OHFO food.

Methods

We conducted individual semi-structured interviews with professionals (identified from earlier work) with experience of development and/or delivery of interventions to improve OHFO food. A review of such interventions in England, informed the topic guide. Interviews were recorded and transcribed verbatim. The Framework method guided data analysis.

Results

Eleven professionals either directly employed or contracted by a local authority participated.

Analysis of interview data identified different intervention sites and related issues for intervention delivery. Takeaways in particular were viewed as important and challenging settings. Intervention delivery issues included: the poor nutritional content of many available foods; intervention characteristics, (e.g. menu labelling versus health-by-stealth); methods of delivery (e.g. use of incentives); difficulties of evaluating interventions; and barriers and facilitators to delivery at five different operational levels. These were: (i) resources and legislation; (ii) intervention deliverer jurisdiction and characteristics; (iii) suppliers of ingredients and packaging; (iv) food business operator; and (v) customer. Perceived barriers to intervention delivery included limited resources and unwillingness of food business operators to engage with interventions. Suggested facilitators for effective intervention delivery included: intensive and interactive programmes; providing step-by-step instructions; providing incentives; and accounting for the practical constraints of the OHFO business.

Conclusions

Interviews highlighted the challenging nature of delivering OHFO interventions. Further research is needed to develop interventions that should account for the complexity of OHFO settings and their relationship with suppliers, and take into consideration the competitiveness of the OHFO business environment.

P2.21

Frequency and socio-demographic correlates of eating meals out and take-away meals at home: cross-sectional analysis of the UK National Diet and Nutrition Survey, waves 1-4

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose:

Food prepared out-of-home tends to be less healthful than food prepared at home. Positive associations between frequency of consumption and both fat intake and body fatness have been reported. Interventions to improve the nutritional quality of out-of-home food have had varying success. There is little data on who eats out-of-home food. We explored frequency and socio-demographic correlates of eating meals out and take-away meals at home, using data from a large, UK, population representative study.

Methods:

Data were from waves 1-4 of the National Diet and Nutrition Survey. Socio-demographic variables of interest were gender, age group, and occupational socio-economic group. Self-reported frequency of consuming meals out and take-away meals at home was categorised as: rarely, 1-2/month, and 1+/week. Analyses were performed separately for adults (aged 18 years or older) and children.

Results:

Data from 2001 adults and 1963 children were included. More than one quarter (27.1%) of adults and one fifth (19.0%) of children ate meals out once per week or more. One fifth of adults (21.1%) and children (21.0%) ate take-away meals at home once per week or more. There were no gender differences in consumption of meals out, but men and boys ate take-away meals at home more often than women and girls ($p < 0.05$). Frequency of consumption of both meals out and take-away meals at home increased with age in children, but decreased with age in adults. More affluent adults and children ate meals out more often ($p < 0.001$). Less affluent children ate take-away meals at home more often ($p = 0.001$). There was no relationship between socio-economic group and frequency of consumption of take-away meals at home in adults.

Conclusions:

A substantial minority of individuals eat meals prepared out-of-home at least weekly. Interventions to improve the nutritional quality of meals out may be more effective, at a population level, if targeted at outlets favoured by more affluent communities and adults aged less than 30 years. Interventions to improve the nutritional quality of take-away meals consumed at home may be more effective if targeted at outlets favoured by children from less affluent communities and adults aged less than 30 years.

P2.22

A SYSTEMATIC REVIEW OF THE EFFECTIVENESS OF INTERVENTIONS TARGETTING SPECIFIC OUT OF HOME FOOD OUTLETS (FOODSCAPE STUDY)

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose:

Food served by out of home food outlets (OHFOs) is typically high in energy content and of low nutritional quality; therefore OHFOs are an appropriate target for interventions to tackle obesity. The aim of this systematic review was to identify, critically appraise, and synthesise relevant evidence of impact, effectiveness and cost implications of interventions to promote healthier menu offerings in OHFOs.

Methods:

Electronic searches of 9 databases (e.g. MEDLINE (Ovid)) were conducted for studies published from January 1993 to December 2013. All primary study designs were included if they employed a measure of change (pre to post). OHFOs included were those that served ready-to-eat, prepared food for consumption on or of the premises, with OHFOs not open to the general public (e.g. workplaces) excluded. Outcomes could include consumer or retail level data (e.g. dietary fat intake). Study quality was assessed using the Effective Public Health Project Quality Assessment Tool.

Results:

23 studies were included. 13 studies were repeat cross-sectional, 5 cohort, 2 controlled before and after, and 3 controlled clinical trials. 12 studies assessed effects of nutrient labelling, 1 trans-fat legislation, 6 multicomponent health promotion, 1 personalised receipt, 1 price promotion and 2 telemarketing. Evidence was mainly derived from cross-sectional data in US fast-food chains and concentrated on adults. No cost-effectiveness evidence was identified. Nutrient labelling does not appear to reduce calories purchased across all fast-food chain restaurants, but may reduce calories purchased in specific chains and in a subgroup of adults who use labels. Multicomponent, multilevel interventions may increase healthy food purchases, but evidence is drawn from specific restaurants limiting generalisability. There does not appear to be differential effects of nutrient labelling by age, gender, ethnicity, or socioeconomic status.

Conclusions:

From limited identified evidence, the primary findings are that nutrient labelling may only reduce calories purchased in specific fast food chains and for those who use labels; and multicomponent multilevel interventions may increase healthy food purchases, although evidence is specific to certain restaurants. No data on cost implications were identified, and interventions do not appear to increase inequalities. Further research is required, particularly in European populations and youths.

P2.23

A systematic review of vending machine nutrition interventions to encourage healthier choices made by consumers

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose:

Research internationally has confirmed that vending machines found in public spaces such as schools, hospitals, workplaces and universities provide convenient access to energy dense, nutrient poor food and beverages that contribute to the development of chronic disease. It is recommended by international dietary guidelines to minimise consumption of these foods and therefore vending machines are suitable targets for public health efforts. There is no known systematic review on the efficacy of vending machine interventions. The aim of the current study was to systematically survey the literature to determine if nutrition interventions can improve the quality of vended snacks and beverages.

Methods:

A literature search in databases Cochrane, EMBASE, CINAHL, Science Direct and PubMed was conducted for interventions to improve the nutritional value of snacks and beverages made by vending machine consumers. Articles were screened with the inclusion criteria: 1) Nutrition interventions in vending machines 2) Experimental trials. Risk of bias in papers was assessed with the Evidence Analysis Manual developed by the Academy of Nutrition and Dietetics. Synthesis was narrative as the articles were heterogeneous and could not be pooled for meta-analysis.

Results/findings:

Eighty-three articles were screened for inclusion and fifteen interventions were included for synthesis. Settings included schools (n=3), universities (n=6), workplaces (n=6) and parks (n=1). Pricing interventions (n=4) included RCT (n=3) and significantly increased sales of healthier snacks. Seven out of ten interventions increased availability of healthier snacks, without a decline in profits and/or sales volume. Point-of-purchase promotion of healthier snacks (n=10), produced significant but minor changes (range: 1-6%) to the proportion of healthier snacks purchased in half of the studies (p: <0.05), the remaining failed to produce significant results (p: > 0.05).

Conclusions:

Pricing and availability strategies appear effective approaches for improving nutrition of vended snacks and beverages. Point-of-purchase nutrition labelling may have limited positive effects. Homogenous studies with robust study designs are required to confirm these results.

P2.24

Shopping when hungry: factors influencing the healthfulness of supermarket baskets

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SIG: Yes, Policies and environments

Awards: No

Introduction: In developed societies up to 60% of food consumed comes from supermarkets. A previous small-scale study (Wansink&Tal 2013) suggested that hunger levels could influence food purchasing – fewer energy-dense (unhealthy) foods were chosen in a simulated-task between 1-4pm (when shoppers assumed not to be hungry, ie “full”), compared to 4-7pm (when shoppers assumed to be hungry). It is unclear whether the same pattern will hold on a larger sample of real purchases, and what other variables moderate the relationship between hunger and healthfulness of food purchases.

Methods: A large sample of supermarket transaction data (n=951 purchased items) was examined to evaluate relationship between shopping time (as a proxy for hunger) and the ratio of low- (“healthy”) to high- (“unhealthy”) energy-dense foods coded using the Australian Dietary Guidelines. Additionally, a mall-intercept survey with the shoppers who made those transactions (n=110) was used to confirm hunger status and duration of shopping trip.

Results: Self-reported hunger was lower in shoppers surveyed 1-4 pm compared with those surveyed 4-7 pm, confirming differences in hunger during these time periods. However, in contrast to the earlier study, baskets of “hungry” (4-7pm) shoppers contained slightly fewer healthy foods but the same number of unhealthy foods, compared to “full” (1-4pm) shoppers. There was no relationship between self-reported hunger levels and the proportions of healthy/unhealthy items purchased. Yet, “hungry” (4-7pm) shoppers spent significantly less time and money in-store.

Conclusion: Shopping at a time of day when one is more likely to be hungry does not influence the purchase of foods that are energy dense (i.e. unhealthy), but may reduce the purchase of healthier foods (i.e. those that are less energy dense). The purchase of less healthy foods at this time of day (e.g. after work/before dinner) might be associated with time pressure and the shorter time spent shopping might

P2.25

Perception of food fussiness - influence on maternal feeding practices and food intake amongst Australian toddlers in the NOURISH and SAIDI cohorts

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: The toddler years are characterized by the development of autonomy and independence. Toddlers can vehemently express their desire not to eat and food refusal is common due to neophobia and ability to self-regulate energy intake. This behaviour can prompt use of maternal feeding practices which are unresponsive to a child's hunger and satiety cues e.g. pressuring child to finish a meal or encouraging eating in the absence of hunger by offering food in response to distress. This study aimed to investigate what practices mothers use if they perceive their toddler as a fussy eater, and subsequent influence on child dietary intake.

Methods: Mothers of the NOURISH control group and South Australian Infants Dietary Intake studies (n=332) completed a self-administered questionnaire at child age 12-16 months. This included demographic characteristics, questions regarding maternal perception of food fussiness and the Infant Feeding Questionnaire (Baughcum et al, 2001). Dietary intake was measured using one 24-hour recall. Latent variable structural equation modelling was used to test the conceptual model perceived food fussiness → maternal feeding practices (‘use of food to calm’, ‘feeding on schedule’ or ‘awareness of hunger and satiety cues’) → child food intake (gram intake of specific food groups).

Results/findings: Children were on average 13.8(1.3) months, 49% male, 24% were breastfeeding and 30% were perceived as a fussy eater, while 58% of mothers had a university education. The model showed acceptable fit ($\chi^2/df=2.28$, GFI=.96, RMSEA=.06(.04-.08), PCLOSE=.15, CFI=.92). The only feeding practice associated with maternal perception of her child as a fussy eater was ‘use of food to calm’ ($\beta=.16$, $p<.01$). This practice was associated with intake of breastmilk (g/day) ($\beta=.21$, $p<.01$), but not with intake of any other food group, including discretionary choices (energy-dense, nutrient-poor foods) or sweet beverages.

Conclusions: Mothers appear to use breastfeeding as a way to calm their toddler if they perceive the child as fussy. This does not support the common perception that ‘unhealthy’ foods are offered in response to distress. The level of tertiary education seen amongst mothers may contribute to this finding. These results highlight the complex interactions between behaviour and nutrition amongst mother-toddler dyads.

P2.26

Early education professionals' perceptions of barriers and promoters for healthy eating in preschools - a focus group study

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SIG: Yes, Early care and education

Awards: No

Purpose: A majority of the Finnish children aged 3-6 years are at preschool. Preschools serve three fixed meals daily; breakfast, warm lunch and an afternoon snack. Using the socioecological model, one can say that preschools are as important as the family for the eating habits of preschool children. The aim of this study was to, by interviewing early education professionals define important promoters and barriers for a healthy eating among children in the preschool.

Methods: The early education professionals were recruited for the focus group interviews through the preschools. Four interviews were conducted in October 2014 (n=14, mean age 45.6). The interviews were semi-structured with four main themes. A deductive thematic analysis was conducted for the interviews using NVivo10, qualitative data analysis software. A data framework to code the data, which was based on the major themes of the questioning route and socioecological model, was used by two independent researchers.

Results: Early education professionals found several factors in the preschool environment that acted as barriers for encouraging children to eat fruit and vegetables. Barriers mentioned, among others, were that fruits were not available daily, vegetables were mixed as salads that the children did not like, and there was no possibilities for the children to serve themselves salad when sitting at the tables. Overall, the served food contained little sugar and most sugar rich foods were served as the afternoon snack. Most early education professionals, especially those who had much working experience, perceived themselves as important role models for the children and as having enough skills to encourage children to taste and eat the served food.

Conclusions: Early education professionals see themselves and their role as important in the development of children's eating habits. Many of the barriers for a healthy eating were seen at the physical level; such as no daily fruit, salads not suitable for preschool children, and several restrictions in how and when the food is to be served.

P2.27

Childhood obesity, dietary quality and the role of the local food environment

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective:

As policymakers are increasingly recognising the potential role of the local food environment to improve diet, it is essential we understand which features of the local food environment influence dietary quality and health. This study aims to explore if distance to and density of food outlets (supermarkets and convenience stores) in the local area impact on (1) dietary quality and (2) body mass index in 9 year old children whilst controlling for socio-economic characteristics of the family.

Methods:

Cross sectional analysis of the Growing Up in Ireland (GUI) Child Cohort Study, a two-stage clustered sample of 8568 nine year old children from the Republic of Ireland. Objective height and weight measurements were used to calculate body mass index (BMI). Diet was assessed using a modified Sallis Amherst food frequency questionnaire. Family level socio-economic status was measured using household class, household net equivalised income and highest level of maternal education. Food access was measured as network distance to and density of convenience stores and supermarkets in the local area. Separate fixed effects regression models were used to assess the impact of food access in the local area on dietary quality and BMI, stratified by gender.

Results:

After controlling for the socio-economic characteristics of the household, there was little evidence to suggest that distance to the nearest convenience store or supermarket was associated with diet quality in girls or boys. However, for girls, increasing distance to the nearest supermarket resulted in a non-significant decrease in dietary quality. The density of convenience stores or supermarkets within 1000m of the household did not impact on diet quality. Maternal education was consistently associated with diet in the regression models. Similar findings were observed for BMI.

Conclusions:

The distance to and density of food stores in the local environment did not impact on dietary quality or BMI in children. Parental and household level factors were be important than the food environment in determining diet and weight status in children. A better understanding of how features of the local area influence diet and obesity risk in children is needed.

P2.28

Formative Research to Understand Promoters and Barriers to Participation in the Supplemental Nutrition Program for Women, Infants, and Children (WIC)

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Efforts to engage families at risk of food insecurity with resources and nutrition education within the context of food assistance programs may be hindered by real or perceived obstacles. The purpose of this study was to understand promoters and deterrents to enrollment in the Women, Infants and Children (WIC) program in southern Arizona, as well as reasons for early dropout.

Methods: A series of focus groups were conducted with WIC staff ($n=4$ groups of 6-7 individuals) and WIC clients ($n=7$ groups of 4-6 individuals who were current or past participants). Semi-structured interview scripts, consisting of approximately 14 open-ended questions were developed to guide discussions about promoters and deterrents to enrollment and retention in WIC. Each focus group discussion lasted 60-90 minutes. Discussions were audio-recorded and transcribed verbatim by the research team. Transcripts were coded and analyzed using deductive thematic analysis.

Results: The major motivator for families to enroll in WIC included material support provided by the agency (i.e., formula, supplemental food, breastfeeding information and breast pumps). A primary reason for incomplete enrollment or early attrition was the time commitment required to complete the enrollment process coupled with limited availability of appointments, often conflicting with clients' work schedules or public transportation schedules. Clients often chose to stop participation after their child was weaned, believing that WIC was primarily a "[baby] formula program." Overall, enrolled clients reported that WIC nutrition education was valuable; however, this aspect of WIC was not well advertised and some clients felt it "forced" upon them. Factors influencing clients' retention included experiences at the grocery store while obtaining WIC foods, and how well these foods aligned with culture and preferences. Additional factors influencing retention included having multiple WIC-eligible children, or clients' beliefs that it was important for them to contribute financially to the household by obtaining WIC food.

Conclusions: Recommendations by WIC clients and staff to improve enrollment and retention in WIC included reducing in-person time dedicated to program enrollment (e.g., initiating enrollment online) and structuring nutrition education sessions to be more customized and flexible to the individual with regard to topics discussed and education delivery method.

P2.29

Parental strategies used to encourage and discourage healthy eating in 5 to 12 year old children

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Obejective: To describe strategies parents use that either encourage or discourage their children to eat a healthful diet and to identify if these strategies vary by gender of parent.

Methods: A stratified sample of 135 parents in the US and Canada were recruited to complete an open-ended online survey. Participants were asked about strategies they used to encourage (1 question) or discourage (2 questions) their 5-12 year old child from eating a healthful diet. Two coders independently coded the parent responses based on a coding scheme developed by the research team as part of a review of published measures (81 measures). The coding scheme included 21 primary codes and 45 secondary codes. All discrepancies were discussed and triangulated. Data were reviewed qualitatively and we examined whether responses differed by parent gender (60% were female). Primary codes that accounted for at least 5% of responses were summarized.

Results: Parental strategies most often used to encourage healthy eating among 5 to 12 year old children were (in priority order): teaching/reasoning, making healthful food accessible/available, preparing food in a healthful way, rewarding/bribing, using autonomy supportive strategies, modeling, and engaging child in food preparation. Mothers emphasized more autonomy supportive, modeling, and child engagement approaches, whereas fathers emphasized more rewards/bribes and parental encouragement as approaches to encourage healthful eating. Parental strategies that discouraged healthful eating among 5 to 12 year olds included (in priority order): having less healthful food accessible/available, preparing less healthful foods (e.g., using pre-packaged or processed food), structure of the feeding environment (e.g., frequency of going out to restaurants), child control (e.g., allowing child to eat unhealthful food), and less healthful modeling. Mothers and father emphasized similar discouraging practices.

Conclusions: With the exception of rewards, parents reported many strategies that can foster self-regulation of healthful eating in children. Interestingly, fathers emphasized that rewards and bribes were needed to encourage healthful eating in their child that may negatively influence their child's ability to self-regulate. While mothers and fathers noted many similarities in the approach they used to encourage/discourage healthful eating, it is important to understand what parents do to develop better intervention approaches.

P2.30

Differences in fruit and vegetable intake by household food security status among very low-income adults in the Midwestern United States

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective:

To examine differences in daily fruit and vegetable (FV) intake frequency across household food security status (high or marginal food security, low food security, and very low food security) among a very low-income population in the Midwestern United States.

Methods:

Adult participants (aged 19 and older and caregivers to at least one child aged 0-18) were recruited from public libraries, food pantries, and other community locations to participate in a cross-sectional self-administered survey (n = 306). Analysis of variance was used to examine differences in daily FV intake frequency, measured from a sum of five items from the 16-item NYPANS dietary screener (fruit, green salad, carrots, other vegetables, and 100% fruit juice), across household food security levels (measured using the 6-item USDA Household Food Security Survey Module). Two-tailed significance was set at $P < .05$, and Bonferroni corrections were applied in post hoc analysis.

Results

The sample was 75% female, 51% African American, 15% Hispanic, and 34% non-Hispanic White. A majority of participants (83%) reported annual household incomes under \$25,000. A high proportion of participants (41%) had very low food security, as compared to the national average of 5.6%. Household food security status was significantly associated with frequency of FV intake [$F(2, 285) = 857, p = 0.0002$]. In post hoc analysis, those with high or marginal food security reported consuming FV 3.6 times ($SD=2.8$) per day, while those with very low food security only consumed FV 2.1 ($SD=2.2$) times per day ($p < .05$).

Conclusions

Increasing access to healthy affordable foods, such as FVs, along with nutrition education and messaging among at-risk populations such as those who are food insecure, may ultimately serve to prevent obesity and other chronic diseases. Food pantries and food banks could be an access point where food insecure families could obtain FVs, as well as other more healthful food items to promote better overall health.

P2.31

Neighborhood Food Environment as a determinant on store choice among Supplemental Nutrition Assistance Program (SNAP) households and SNAP eligible but not participating households

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: One way neighborhood food environments may influence dietary intake is through influencing an individual's food store choice. Neighborhood food environment might be important for food store choice for individuals with constrained resources and might vary depending on whether resource-constrained individuals also participate in Supplemental Nutrition Assistance Program (SNAP - formerly food stamps). The objective was to determine how neighborhood food environment is associated with store choice among SNAP households (at least one SNAP beneficiary n=1421) and SNAP-eligible households (below 185% of the poverty line with no SNAP beneficiaries n=2499).

Methods: USDA's National Household Food Acquisition and Purchase Survey (FoodAPS) is the first nationally representative survey of American households to collect comprehensive data about household food purchases. Respondents reported their primary and secondary food shopping stores, reasons for choosing primary store, travel costs, travel time. Participant addresses were geocoded and .5 mile buffers were used to determine the number of various types of food venues in their neighborhood.

Results: SNAP households report mean one-way travel cost to store as \$2.79, whereas SNAP eligible report \$1.93. In both sub-samples, 47% report a large grocery store as their primary store with 50% reporting a supercenter as their primary store. Among SNAP and SNAP-eligible households, driving farther than 4 miles to their primary store was associated with lower odds of choosing a supermarket store relative to a supercenter (-.91 OR 95% CI -1.44, -0.36 $p=0.001$ SNAP eligible and -0.96 OR 95% CI -1.49, -0.42 SNAP). Further, SNAP households that live in a neighborhood (1/2 mile buffer) with at least two supermarkets report lower odds of purchasing food at a gas station or convenience store (OR -2.66 95% CI -4.88, -0.45). Lastly, SNAP households with at least one farmers' market in their neighborhood reported higher odds of choosing a small- to medium-size grocery store (OR 1.93 95% CI 0.04, 3.82).

Conclusion: Neighborhood-level variables influences store choice among SNAP and SNAP-eligible households. Driving time and venue availability in neighborhoods is associated with store choice among SNAP households and SNAP-eligible households, locating stores near these sub-populations might improve store choice and subsequent dietary intake.

P2.32

Development, implementation and evaluation of Healthier Choice Catering Guidelines for the tertiary education setting

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Catering services have experienced significant growth as governments and businesses increasingly outsource catering for onsite outlets and events. Of concern is evidence showing such foods procured outside the home to be of poorer nutritional quality and associated with excess weight gain. Increasingly, employers and their employees recognise a responsibility of workplaces in health promotion, with the average employee spending one-third of their waking hours in the workplace. Yet, little evidence exists for the effectiveness of healthy food procurement policies in this setting. This project aims to develop, implement and evaluate policy guidelines addressing the nutritional quality of food and beverages provided at catered events in a large tertiary education workplace.

Methods: Healthier Choice Catering Guidelines (HCCG) were developed using national food-based dietary guidelines and existing government and non-government catering policies. Stakeholders from dietetics, commercial catering, university staff, venue management, policy management and marketing were engaged to refine the HCCG, and formulate an implementation and evaluation plan.

Results: The HCCG address the nutritional quality of food and beverages provided while preserving the epicurean culture of event catering, as well as sustainable food service practices. Implementation of the guidelines requires a three-tiered approach with responsibility placed on event organisers (primarily staff), due to the diversity in methods for organising event catering in this setting. Pre- and post-implementation, event audits and event attendee surveys will be administered to assess the nature of foods and beverages provided and actual consumption, respectively. Semi-structured telephone interviews conducted with event organisers and commercial caterers will evaluate processes of implementation, in addition to compliance audits and sales data.

Conclusions: This abstract will present the HCCG and associated protocols for implementation and evaluation, and discuss challenges to policy implementation and adoption in the tertiary education setting. If effective, there is significant potential for the translation of the HCCG for use in tertiary education settings at a state or national level.

P2.33

Does general parenting influence 3-6-year-old children's food intake?

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: To examine associations between parenting behaviour and consumption of fruits, vegetables and sweet foods and beverages in 3-6-year-old children.

Methods: A cross-sectional study was conducted as a web-based questionnaire in Finland in autumn 2014. In total, 173 parents of 3-6-year-old children completed the Comprehensive General Parenting Questionnaire including the five key constructs of general parenting: nurturance, structure, behavioural control, coercive control, and overprotection. Additionally, parents reported the food intake of their child by food frequency questionnaire. Participants were recruited mainly through selected non-governmental organizations' social media channels and a few day care centers. The mean age of the participants was 36 years and 75 percent of them had completed at least a bachelor's degree. Spearman correlations were used to study the associations between parenting behaviour and children's food intake.

Results: Structure was correlated with less frequent consumption of sugar rich beverages and sweets and cookies. A negative correlation was found between overprotection and fresh fruits and fresh vegetables consumption whereas a small positive correlation was found between overprotection and sugar rich puddings and yoghurt consumption. Children consumed more frequently sugar rich puddings and yoghurt and less frequently fresh vegetables when parents scored higher on coercive control. Additionally, a small positive correlation was found between fresh vegetables consumption frequency and nurturance.

Conclusions: Our findings suggest that positive parenting behaviour i.e. more structure and nurturance and less overprotection and coercive control may encourage children to adapt more favorable eating habits. Parents should be encouraged to provide more structure and nurturance, which could support children's healthy food intake.

P2.34

Nutritional problems already start in European preschoolers: the ToyBox-study

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective: to examine the diet quality of European preschoolers and to investigate the differences in diet quality according to gender, socio-economic status (SES) (educational level of the mother) and overweight/obesity status.

Methods: Parents of 2.5 to 5.5 year olds (n=7063; mean age: 4.8 ± 0.4 years; 52% boys; overweight or obesity: 14.7%) were recruited through kindergartens in 6 countries (Belgium, Bulgaria, Germany, Greece, Poland and Spain) within the ToyBox-study. Parents reported their socio-demographics data and filled in a semi-quantitative food frequency questionnaire about their children's daily intake. Body weight and height of the preschoolers were objectively measured. The dietary quality was evaluated based on the total Diet Quality Index (DQI) scores for preschoolers and its four subcomponents (diversity, quality, equilibrium and meal index). By using DQI scores to assess diet quality, the complexity and the multidimensional nature of food consumption patterns were also covered. A score of 100% represents a perfect dietary quality. The total DQI and the subcomponents are reported as percentages of maximum scores. MANOVA's were performed to assess differences in DQI scores according to gender, SES and overweight status. Differences were tested in the total sample and stratified by country.

Results: The mean total DQI score was 68.3%. Mean scores of the subcomponents were 61.7% for dietary diversity, 56.5% for dietary quality, 65.4% for dietary equilibrium and 72.9% for the meal index. Preschoolers of lower SES backgrounds had lower scores on the total DQI and on all subcomponents. No clear differences were found by gender and overweight status. Results differed slightly according to country, this will be presented at the conference.

Conclusions: Preschoolers scored low on the total DQI and especially on dietary quality. The lack of difference by overweight status could be explained by the young age of the children. The negative health effects of an unhealthy diet might not be seen yet, but tracking of the unhealthy food choices may lead to an increase of overweight in later life, on top of the already high prevalence of overweight at preschool age. An optimal food intake should be enhanced, especially in preschoolers of lower SES backgrounds.

P2.35

Local food environment interventions to improve diet in adults: using a systematic search and realist synthesis to address the program theory gap

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Local food environment factors have been associated with less healthy diets in adults. However, overall evidence remains mixed with calls for increased theoretical and conceptual clarity related to how availability of neighbourhood food outlets, and in-store food options, influence diet. Therefore, the purpose of this study was to develop a program theory of food availability, supported by empirical evidence from a range of local food environment interventions.

Methods: A systematic search of the literature was followed by independent screening based on study criteria (target population age 16-65, retail setting available to the general public, change in food availability via the introduction of new food stores or food items, measure of diet behaviour), and quality assessment using the Effective Public Health Practice Project tool. Realist synthesis was then conducted according the RAMESES publication standards, including transparent appraisal, synthesis, and drawing conclusions via consensus.

Results: The final synthesis proposes an evidence-based program theory, including evidence mapping to demonstrate contextual factors, pathways of influence, and potential mechanisms.

Conclusions: With the paucity of empirically-supported program theories used in current local food environment interventions this synthesis may be used to understand how, why and for whom these interventions may work. It may also inform the development of theory-driven, evidence-based programmes to improve population level diet and future empirical work.

P2.36

Review of the Northern Fruit and Vegetable Program: Influence of Likability on Intake

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: A review of the Northern Fruit and Vegetable Program (NFVP) was used to examine associations among likeability of fruit and vegetables offered vs. not offered and total fruit and vegetable intake.

Methods: In May 2014, grade 5-8 students (n=1577) from northern Ontario, Canada completed an online/paper survey to examine fruit and vegetable likeability, total intake, knowledge, attitudes, and behaviours. Likeability of each fruit (7 offered via the program vs. 3 not offered) and vegetable (7 offered via the program vs. 3 not offered) was scored from 0 (never tried it) to 4 (love it). General linear models and an ordinal logistic regression (OLR) were used, controlling for gender, grade, and school location (urban/rural), to determine associations with overall intake.

Results: Likeability was similar for the NFVP fruit ($\mu=2.8\pm0.8$) compared to those not offered ($\mu=2.9\pm0.9$). Total fruit intake was positively associated with average likability of NFVP fruit ($p<0.001$) yet was not associated with likeability of those fruit not offered ($p<0.001$). The OLR revealed that participants were more likely to have a higher fruit intake if they had higher likeability of apples ($p=0.007$), clementines ($p=0.002$), pineapple ($p=0.003$), and cantaloupe ($p<0.001$); all of which were offered as part of the NFVP. Likeability was greater for the NFVP vegetables ($\mu=2.6\pm0.8$) compared to those not offered ($\mu=1.8\pm1.8$; $p<0.001$). Total vegetable intake was positively associated with average likability of NFVP vegetables ($p<0.001$) and those not offered ($p<0.001$). The OLR revealed that participants were more likely to have a higher vegetable intake if they had higher likeability of broccoli ($p<0.001$), carrots ($p=0.009$), mini cucumbers ($p<0.001$), snap peas ($p=0.002$), green beans ($p<0.001$), and spinach ($p=0.031$); all except green beans and spinach were offered as part of the NFVP.

Conclusion: Likeability of fruit and vegetables were both positively associated with total intake. Interestingly, likeability of vegetables offered in the NFVP were rated higher than those not offered, possibly indicating that exposure (via a school program) may help to increase likeability. Therefore, school programs should continue to offer a variety of fruit and vegetables in order to help increase total intake.

P2.37

Associations between Encouraging Peers or Receiving Teacher/Principal Encouragement and Fruit/Vegetable Intake among Students in Grades 5-8 in Northern Ontario, Canada

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The purpose of this study was to determine the associations between encouraging peers or receiving teacher/principal encouragement to consume and fruit and vegetable intake in students participating in the Northern Fruit and Vegetable Program.

Methods: In May 2014, grade 5-8 students (N=1577; Males=699, Females=840) from northern Ontario, Canada completed an online/paper survey to examine fruit and vegetable likeability, total intake (similar to the Canadian Health Measures Survey), knowledge, attitudes, and behaviours. Students responded to *How much did you encourage your classmates to try new foods?* and *How much did your teacher/principal encourage you to try new foods?* with response options of *strongly encouraged, encouraged, discouraged, strongly discouraged*. General linear models were used to determine associations among encouragement and fruit/vegetable intake, controlling for gender, grade, and school location (urban/rural).

Results/Findings: Approximately 85% of participants strongly encouraged or encouraged their peers to consume fruits/vegetables (was higher among females, $p=0.005$ and younger grades, $p=0.008$), and 84% were strongly encouraged or encouraged by their teacher/principal (was higher among younger grades, $p=0.030$). Fruit consumption was found to be significantly greater when encouraging peers ($p=0.040$) or having teacher/principal encouragement ($p=0.006$). Interestingly, vegetable consumption was higher when encouraging peers to consume ($p<0.001$), yet was not different with teacher/principal encouragement to consume.

Conclusion: Little research has been completed on the associations of encouraging peers and/or teacher/principal encouragement to consume fruit and vegetables. Encouraging peers was found to be statistically significant for both fruit and vegetable intake; however, teacher/principal encouragement was only associated with fruit intake. Further research is needed to determine the best ways for encouragement to consume fruit and vegetables.

P2.38

Using systems science to gain insight into childhood food security in the US

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: Food insecurity in the United States has reached historically high levels. In 2013, 19.5% of households with children were food insecure and 5.9% had very low food security. Systems science methods can assist in the evaluation of policy-related questions. Thus, the purpose of this study was to develop a systems framework of the main influences on childhood food security and their interrelationships, by developing a map of the child food security system.

Methods: We convened a two-day workshop with a panel of national experts in childhood food security with backgrounds in demography, economics, epidemiology, health behavior, nutrition, sociology, and systems science to draft the systems map.

Results: Following a discussion of important actors, pathways, and processes, the panel identified several fundamental elements for the childhood food security map. The map visualizes key influences on childhood food security, including the main sectors of influence, the main actors within each sector, the most important policies or programs in 2013, and the flow of money, food, social capital/support, services, and knowledge between these actors and programs or policies. Major sectors included government (at the federal, state or local levels) and the social, school or education, health, and economic sectors. Important actors included children, parents or caregivers, community members and organizations, family and friends, teachers, healthcare providers, employers, food retail providers, and food production and distribution organizations. The programs or policy levers focused on programs that were created to directly address childhood food security and poverty, such as the various food assistance programs, as well as general public goods and services that more indirectly impact food security, such as public transportation policy and heating assistance.

Conclusions: The systems mapping effort highlighted the interrelated nature of the many influences on childhood food security. In the future, we plan to use the map as a basis of a system dynamics model aimed at identifying key intervention points to improve childhood food security in the US and in discussions with stakeholders.

P2.39

Cost is a deterrent to Australian lower income families choosing a healthy diet.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose:

The 2010 and 2013 Western Australia (WA) Food Access and Cost Survey (FACS) were used to determine the proportion of income welfare dependent and low income families need to spend to purchase a weekly nutritious food basket. Food affordability may determine food choice, and food stress has been identified when more than 25% or more of a household's disposable income needs to be spent on food.

Methods:

Food affordability analysis was conducted using the prices of a representative sample of over 400 foods in 187 main WA grocery stores. The mean cost of a weekly meal plan to meet the nutrition needs for reference families (two parent family and a single parent family with two children) on different levels of income was calculated. Average weekly disposable income was obtained from the Household Income and Income Distribution Survey and welfare incomes and minimum wage incomes were estimated from Centrelink online calculators. The proportion of income as well as the change between the two survey periods was analysed using SAS software.

Results/findings:

For couple families, the average income was almost twice that of low wage earners and three times those on welfare (AUD\$2230, AUD\$1,322 and AUD\$710 respectively). For couple families in 2013, the proportion of disposable income was 44% for families on welfare, 23% for minimum wage earner families and only 14% for families on an average income. For single parent families, the proportion of income required to purchase the meal plan was 35% for those on a parenting allowance, 25% for low income earners and 24% for those on an average income. Between 2010 and 2013 there was a 2-3% reduction in the proportion of disposable weekly income required for food.

Conclusions:

The findings show that for WA families, social inequity determines dietary choice. Despite Australia's welfare system and no Goods and Services Tax on basic foods, welfare dependent families and low income earners need to spend over three times the proportion of their weekly disposable income to purchase a nutritious diet. Policy makers need to consider that less nutritious foods present a better economical choice for families on welfare.

P2.40

The association of core food intake with academic performance.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Core foods are defined as foods comprising the four food groups (1, vegetables and fruit; 2, grain products; 3, milk and alternatives; 4, meat and alternatives). They are important to a healthy diet and in turn, mental development. This study examines the association between core food intakes and academic performance among elementary school children in the Canadian province of Nova Scotia.

Methods: In 2011, 5900 grade 5 students (aged 10-11 years) in Nova Scotia were surveyed along with their parents as part of the Children's Lifestyle and School-performance Study (CLASS II). Information on dietary intake obtained through the Harvard Food Frequency Questionnaire, height and weight, and sociodemographic variables were linked to results of a provincial standardized reading, writing, and mathematics assessment. Multilevel regression methods were used to examine the association between core food intake and academic performance while adjusting for gender, weight status, and socioeconomic characteristics of parents.

Results: Core food consumption had a positive association with academic performance after adjusting for confounding variables. Students who had higher intakes of core food were significantly less likely to perform poorly in reading (PR: 0.51 (0.38-0.69), $p = 0.000$), writing (PR: 0.47 (0.32-0.68), $p = 0.000$), and mathematics (PR: 0.59 (0.49-0.72), $p = 0.000$). Girls performed better than boys in reading, but not mathematics. Children from socioeconomically advantaged families performed better in all measures of academic performance. There was no association between weight status and academic performance

Conclusions: These results indicate a positive association between core food intake and academic performance. These findings highlight the important benefits of healthy diets to support learning.

P2.41

Population-wide implementation of a school fruit and vegetable scheme: evidence and benefits of sustained policy support over a seven-year period.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: School-based fruit and vegetable (F&V) schemes have been found to increase children's consumption of F&V. Despite their efficacy international research suggests that implementation of such programs is suboptimal. In order for the public health benefits of such programs to be realised, implementation across the population of schools is necessary. The evidence regarding strategies for achieving this is however limited. In Australia, national, state and local initiatives have had a sustained focus over the past decade on strategies to prevent child obesity, and to support primary schools' implementation of F&V programs specifically. The aim of this paper is to assess the impact of government investment in the implementation of a school F&V scheme (Crunch&Sip®) from 2008-2014 in New South Wales (NSW), Australia.

Methods: A quasi-experimental study was conducted in primary schools in the state of NSW, Australia. All primary schools in NSW ($n=2200$) had access to Federal and State initiatives, which included F&V promotional campaigns, Crunch&Sip® resources and support from a state-based agency funded to promote Crunch&Sip®. In addition all primary schools ($n=439$) in one region of the state (Hunter New England (HNE)) received additional funding to implement a multi-strategy child-obesity program which included an intervention to specifically increase schools' implementation of Crunch&Sip®. Data to assess the prevalence of Crunch&Sip® were obtained from a database of all primary and central schools that included schools Crunch&Sip® certification status.

Results: Between 2008 and 2014 the proportion of schools in the HNE region that are implementing Crunch&Sip® has risen by 62% (18% to 80% $p<0.0001$) an achievement which is significantly higher than the rest of the State (NSW prevalence in 2014= 37.7%). At a population level, the achievement of 80% of schools implementing the scheme suggests that approx. 105,000 children benefit from the program each day.

Conclusion: Significant positive changes regarding the implementation of school F&V schemes are associated with sustained policy focus and investment at the regional level. Continued policy and investment focus on this strategy are required to ensure that suggested positive gains in addressing overweight and obesity in Australia are not lost, and further gains are made.

P2.42

Moving from policy to practice: A randomised controlled trial of an intervention to facilitate the implementation of a statewide healthy canteen policy.

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Nutrition guidelines and policies governing the availability of foods in school food services, canteens and kiosks have been recommended to improve public health nutrition. Internationally, research suggests that schools often fail to implement practices consistent with such nutrition policies. Without population wide implementation, the potential benefits of these policies will not be realised. The aim of this trial is to assess the effectiveness of an implementation intervention in increasing school canteen practices consistent with a healthy canteen policy of the Australian government known as the 'Fresh Tastes @ School Healthy School Canteen Strategy'.

Methods: 70 primary schools (35 per arm) located in the Hunter region of New South Wales, Australia were randomised to receive a multi-component intervention including; staff training, resources, recognition and incentives, consensus and leadership strategies, follow-up support and implementation feedback. Primary outcome measures were i) the proportion of schools with a canteen menu that does not contain foods or beverages restricted/ banned from regular sale and ii) the proportion of schools where healthy canteen items represent the majority (>50%) of products listed on the menu. Outcome data were collected via a comprehensive menu audit, conducted by dietitians blind to group allocation. Logistic regression models, adjusting for baseline values were used to assess intervention effectiveness

Results: Nine month follow-up data has found a significant increase in menu compliance. There has been a 54% absolute increase in the proportion of schools that don't sell any restricted foods (14% to 68%, $p<0.001$) and a 56% absolute increase in the proportion of schools that have mostly healthy foods (15% to 71%, $p<0.001$). Follow-up data collection for both intervention and control schools will be completed in March 2015 and data presented for the first time at ISBNPA in June 2015.

Conclusion: This is the first RCT internationally examining the effectiveness of an intervention to facilitate implementation of a healthy canteen policy. The study provides a comprehensive description of the methods required to increase implementation of school canteen practices consistent with a healthy policy. The study provides rigorous evidence on which governments can develop strategies to improve the nutrition environments of schools.

P2.43

Beyond 'food deserts'? Measuring local food environments in Australian cities

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

Australia faces the daunting challenge of rising Type 2 Diabetes Mellitus (T2DM) prevalence. T2DM and its antecedents, however, manifest inequitably. Blacktown in western Sydney, for example, contains some of the most disadvantaged areas in the city and has a T2DM prevalence of 6.9%, whereas the affluent eastern suburb of Mosman has 2.5%. This has stimulated interest among policymakers in the concept of 'food deserts' and food environments more generally. Yet there remain no validated indicators that describe the range of food environments across Australian cities. Accordingly, this study aimed to develop consistent indicators of local food environments across all urban areas in Australia.

Methods:

Australian state-government planning policies on food environment were reviewed along with prior research. Spatially attributable policies relating to food outlets (particularly supermarkets, green grocers and takeaways) available where people reside were included in the project scope. Data to operationalise the spatial indicators were sourced from the Australian Urban Research Infrastructure Network and national compilers of geocoded food outlet listings. Pilot indicators developed in Sydney, the most populous city in Australia, are being mapped in relation to socioeconomic and health data.

Results:

Consultations with policymakers revealed that the locations of food outlets are primarily market driven, without attention to health or equity. Three classes of food environment indicators were identified from previous studies: proximity; density; and variety. Indicators for each class are in development using a range of distance/travel-time metrics for 'meshblocks', which contain approximately 30 to 60 dwellings. These indicators will be visualised and interrogated at a range of spatial scales for all Australian cities. Further work will involve examining associations between these indicators, dietary behaviour and weight status.

Conclusions:

Preventing T2DM will require major efforts outside the traditional purview of the health sector, such as developing 'liveable' neighbourhoods. Potential inequities in the provision of local food environments will be explored, especially where healthier choices are constrained and/or less healthy options are densely clustered, to guide future initiatives. The pilot work in Sydney will then be scaled up to create a national set of validated indicators to enable comparison within and between cities across Australia.

P2.44

Factors associated with concern about the impact of the environment on food supplies.

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective:

Little is known about community concern over the effect of the environment on future food supplies or support for government regulation of environmentally friendly food. This study aimed to identify factors associated with Western Australian adults' views regarding these aspects of the environment and food supply.

Methods:

Data was pooled from the Department of Health's 2009 and 2012 Nutrition Monitoring Survey Series random sample of 2,832 adults (18-64 years). Computer-assisted telephone interviews assessed knowledge, attitudes and behaviours relating to the Australian Dietary Guidelines and food policy. Two single item questions were the outcome variables of this study 1) "How important would you say it is that the government has control over or regulates the supply of environmentally friendly food?" and 2) "How concerned would you say you are about the effect of the environment on the future of food supplies?" Factors associated with the outcome variables, including socio-demographics, health consciousness of diet, body weight and intake of foods related to sustainable eating, were analysed using binary logistic regression.

Results:

Gender was significantly associated with importance placed on government regulation of environmentally friendly food ('not at all/not very important/neither' versus 'quite/very important'). Females (n=1835) were more likely to rate this issue as 'quite/very important' than males (n=997) (OR=1.63, 95%CI [1.09,2.44], P=.02). Concern for the effect of the environment on future food supplies was significantly associated with the amount of attention people paid to the 'health aspects of the food they eat'. Compared with those who paid 'a lot of attention', people who 'take a bit of notice' or 'don't really think much' were significantly less likely to report being 'quite/very concerned' about the effect of the environment on future food supplies (OR=0.53, 95%CI [0.35,0.8] and OR=0.38, 95%CI [0.17,0.81], respectively).

Conclusions:

Findings from this study should reassure regulators that the community believe in the importance of government control of the food supply and to consider action to manage the effect of the environment on future food supplies. Females and people who pay more attention to the health aspects of diet were more concerned about environmental issues relating to food.

P2.45

Texture acceptance and vegetable intake in picky eating infants and children

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SIG: Yes, Children and families

Awards: No

Purpose: Many parents worry about what their children eat or don't eat, especially if the child is perceived to be a picky eater. Rejection of vegetables and new foods are often described by parents, but they also mention negative reactions to texture and aroma. Appropriate texture introduction in weaning is important and might impact later pickiness and food acceptance. As not much is known on this relationship, this study aimed to explore the associations between picky eating, texture acceptance and vegetable intake in a nationally representative sample of pre-school children.

Methods: The 2008 Feeding Infants and Toddlers Study (FITS) was used to examine picky eating, texture acceptance and vegetable intake (24-hour recall) in infants and toddlers 4- 47.9 months old (n=2876). Logistic regression was used to examine associations between demographic and feeding characteristics and picky eater status in four age groups. Differences in vegetable intake between picky and non-picky eaters, and between texture accepters and resisters was analyzed according to vegetable type (yellow/orange, dark green, etc.), and preparation method (babyfood, raw, cooked).

Results/findings: Texture resistance was more often reported for picky eating children (48 to 53%), than for non-picky children (15 to 22%). Compared to non-picky children, picky eating children were more likely to be older, neophobic, texture resistant, to eat only favorite foods, to get more new food offerings, and to be never breastfed. Overall, vegetable intake declined with age. Picky eating children aged 24 to 47.9 months ate significantly fewer raw vegetables than non-picky children. The same lower intake of raw vegetables was found for texture resisters (36-47.9 months).

Conclusions: Picky eating and texture resistance are co-occurring eating behaviors in children that could have an impact on the consumption of raw vegetables. Children do not only need to get familiar with the taste of vegetables, but also with the in-mouth feeling and processing of the foods. A lack of texture offerings in early months might have effects on later food acceptance. To facilitate infants' acceptance of more complex textures at later stage, appropriate feeding advice for parents on texture introduction to children should be developed.

P2.47

Macronutrient intake in infancy and hippocampal volume and memory performance at age 6: The Generation R Study.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Animal research demonstrates that protein malnutrition as well as high fat and high carbohydrate intake can influence hippocampal development and downstream memory performance. The present study aimed to evaluate the relation between macronutrient intake during infancy and hippocampal volume and memory performance at age six, in 441 children participating in a population-based cohort, The Generation R Study.

Methods: Macronutrient intake in energy percentages (E%) was measured by means of a validated Food Frequency Questionnaire at the age of 14 months. Hippocampal volumes (mm³) were measured using high resolution structural magnetic resonance imaging at age six. Verbal and non-verbal memory performance was assessed by means of a neuropsychological test battery on the same day of scanning. Multiple linear regression analyses were performed to investigate the associations, using both single factor and substitution models. Analyses were controlled for potential confounders such as total brain volume, total energy intake and socioeconomic factors.

Results: Only total protein intake was associated with hippocampal volume in the single factor model ($B: 39.56; 95\%CI: 2.60, 76.52; p=.036$). In the substitution models a higher intake of protein at the expense of fat ($B: 51.58; 95\%CI: 10.40, 92.76; p=.014$) or carbohydrates ($B: 40.92; 95\%CI: 3.92, 77.92; p=.030$) was associated with larger hippocampal volume. In line with this, smaller volumes were observed when substituting fat for protein ($B: -53.19; 95\%CI: -94.68, -11.70; p=.012$), and when substituting carbohydrates for protein ($B: -42.43; 95\%CI: -79.91, -4.95; p=.027$). Effects were specific to hippocampal structures, and no differences were observed for the different macronutrient sources. Macronutrient composition was not associated with memory performance.

Conclusions: Composition of macronutrients in infant diet is associated with hippocampal volume at the age of six years. Overall, a higher protein intake is associated with larger hippocampal volume, independent of total caloric intake and protein source. Macronutrient composition was not associated with memory performance. Further research is needed to investigate the long-term effects of early diet on a broad range of cognitive domains and brain structures in healthy children, using various nutritional and statistical methods.

P2.48

Does maternal history of eating disorders predict mothers' feeding practices and preschoolers' emotional eating?

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective: We aimed to examine whether a maternal history of eating disorders predicted mothers' feeding practices and preschoolers' emotional eating patterns.

Methods: Data were available from 4851 mothers and their children, who participated in a Dutch population-based cohort study (the Generation R Study). Maternal history of lifetime eating disorders was assessed during pregnancy using a self-report questionnaire. Mothers filled out the Child Feeding Questionnaire and the Child Eating Behaviour Questionnaire when children were four years old. Linear regression analyses were performed, adjusting for potential confounders.

Results: Of all mothers, 8.6% had a history of an eating disorder (2.5% anorexia nervosa (AN); 3.9% bulimia nervosa (BN); 2.2% both AN and BN). Compared to mothers without a history of eating disorders, mothers with a history of eating disorders, in particular AN, used less pressuring feeding strategies (standardized $B=-0.30$; 95% CI: -0.49, -0.11). Children of mothers with a history of AN had relatively high levels of emotional overeating (standardized $B=0.19$; 95% CI: 0.00, 0.39). Maternal history of BN was not related to mothers' feeding practices or children's emotional eating.

Conclusions: Overall, the levels of emotional overeating amongst children of mothers with a history of eating disorders are noteworthy, particularly considering the young age (4 years) of participating children. This finding may reflect an effect of maternal eating disorders on the development of disordered eating patterns, but could also be subject to mothers' perception.

P2.50

Modifying the Environmental Policy Assessment and Observation Tool to Better Capture Feeding Practices of Family Child Care Home Providers

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Purpose: To modify a current observational tool, the Environmental Policy Assessment and Observation (EPAO), to capture a wider range of feeding practices used by family child-care home (FCCH) providers.

Methods: The current EPAO was reviewed to identify existing gaps in feeding practices assessed (e.g., child involvement, meal atmosphere, provider attempts to control child eating, praise for unhealthy habits and food rewards). Additional items (n=25) were generated after reviewing existing feeding measures. Face and content validity were assessed by three experts and modifications made. To pilot test new items, 5 FCCHs were recruited to participate in video-recordings of feeding interactions. Recorders were placed in the room where meals occurred. Up to three meal occasions were recorded over a two week period. Videos were coded using the revised EPAO and frequencies calculated across total lunch observations (n=12).

Results: In less than half of the observations were children involved in meal preparation, planning or cleaning (42% of observations) and only two homes provided child size appropriate tableware. With regards to atmosphere of the meal, during almost all observations the provider lead pleasant non-food conversations (83%) but providers also talked or texted on the phone during the meal (17%), rushed children to finish their food (42%), and ignored or showed indifference to a child during the meal (33%). The provider attempted to control a child's eating by spoon-feeding (when not developmentally appropriate, 75%) or insisting that a child eat a certain food (83%). Providers talked about feelings hunger or fullness with children (75%) but rarely used reasoning to eat healthy foods (33%). Praise for eating unhealthy foods (25%) or cleaning their plates (67%) and using food as a reward for eating specific foods on their plate (33%) was also observed.

Conclusions: The newly added items capture both positive and negative practices which are associated with self-regulation of energy intake. Future studies should pilot test the modified EPAO with a larger sample of FCCH's and conduct a confirmatory factor analysis to test the anticipated factor structure of the new items. Better assessment of FCCH provider practices can help inform future interventions to improve feeding practices.

P2.51

Longitudinal associations between parent reports of child food acceptance and parent feeding practices

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SIG: Yes, Early care and education

Awards: No

Purpose:

The purpose of this study was to investigate the developmental trajectory of parental perceptions of young children's food acceptance and to determine whether parental feeding practices are associated with young children's food acceptance. Young children are described as exhibiting food neophobic behaviors during the preschool years. However, longitudinal studies examining young children's food acceptance and parental feeding strategies have not been performed previously in diverse samples.

Methods:

As a part of the Colorado LEAP Study, parents reported their child's food acceptance patterns by completing the Negative Reaction to Food Scale (NRF; Plomin & Rowe, 1977; range 5-25) at the beginning and end of the preschool academic calendar (~7 months apart). Parent child feeding practices were measured with constructs from the Child Feeding Questionnaire (Pressure to Eat, Restriction, & Monitoring; Birch et al., 2001; range 1-5). Data were examined for the temporal association of NRF between Time 1 (T1) and Time 2 (T2) and for associations between children's NRF and parental feeding practices using the GLMSELECT procedure in SAS 9.4.

Findings:

Parents (n=100; 24% Latino) of preschoolers (56.1 ± 4.2 mo; 50% boys) participated at both time points. Mean scores on the NRF for T1 and T2 were 14.11 ± 0.42 and 14.28 ± 0.49, respectively and the mean score for Pressure to Eat at T1 was 2.96 ± 0.08. No differences were noted in children's score for NRF by parental income or education, or by sex of child. Parent ratings of children's NRF were significantly correlated across time points (r_{T1,2} = 0.65, p<0.0001). Parent reports of Pressure to Eat at T1 (=0.15 ± 0.43; 95% CI [0.01, 1.74], P=0.046) were significantly associated with children's NRF at T2, when controlling for NRF at T1 (=0.64 ± 0.08; 95%CI [0.50, 0.81], P<0.0001; total adjusted R-Square = 0.49, F(2,97)=48.54. p<0.0001).

Conclusions:

Children's food acceptance (NRF) appears to be a moderately to highly stable trait over the course of the 4th year of life. However, parental use of feeding strategies which pressure the child (in attempts to encourage increases in food intake) appear to contribute to increased food resistance.

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P2.52

Fuel for Fun: Variability in Teachers' Nutrition Beliefs and Practices in the Elementary School Environment Warrant Attention in Impact Assessment

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SIG: Yes, Early care and education

Awards: No

Objective: Teachers serve as role models to their students whether intentional or not, yet their personal and professional nutrition beliefs and behaviors are poorly understood. We wanted to assess 4th grade teachers' beliefs about the nutrition environment in their school and their food attitudes and behaviors in and outside the classroom, as part of a multi-component school-based childhood obesity intervention called Fuel for Fun (FFF).

Methods: Previously validated, theory-based surveys were adapted and tested with a similar audience. Eating Competence (EC) was assessed with the Satter Eating Competence Inventory 2.0. FFF teachers completed the 72-item survey that measured their 1) ability to influence the school nutrition environment, 2) beliefs about responsibility for teaching children about foods and nutrition, 3) food role modeling behaviors and perceived value, 4) level of EC, and 5) number of college nutrition course taken. Analyses included measures of association, such as chi-square.

Results: Respondents (21 of 24 recruited) were 86% female, 95% white, primarily aged 30 - 50, and 37% were overweight. Mean EC score was 31.3 + 9.4; 45% were EC (score ≥ 32). 86% had taught 6 or more years. 1/3rd completed a graduate degree, and number of college nutrition courses taken varied: 57% none, 24% 1, 19% 2+. More strongly believed they could influence the nutrition environment in their classroom than the cafeteria or school at large, and that they had greater influence on food choices for classroom parties and treats than elsewhere. EC teachers believed that teachers have responsibility to encourage healthful foods in the classroom (P=0.006), and that it is difficult to provide a healthful nutrition environment at school (P=0.02). Belief that children imitate observed teacher eating habits was associated with completion of >1 college nutrition courses (P=0.002). Eating competence was not associated with having taken college nutrition courses.

Conclusions: Teachers believed they had more influence over the classroom nutrition environment than other school areas, providing insight for broadening their role in future interventions. Attention to teachers' beliefs and eating competence appears warranted for intervention development and evaluation.

P2.55

Minority residents in low-income historically disadvantaged communities perceive community gardens as a positive approach to address multiple barriers to healthy eating

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective:

Situated within a socioecological framework, a wealth of data link health behaviors, such as diet, with neighborhood environments. Several studies have explored community-level factors associated with poor diet. However, less research has explored perceptions of community-level opportunities to increase healthy eating, especially among residents of low-income neighborhoods and using in-depth qualitative methods. The purpose of this study was to understand perceptions of how neighborhood characteristics affect healthy eating among residents from historically disadvantaged, low-income neighborhoods.

Methods:

Eight focus groups were conducted with 8-12 participants each, who resided in low-income neighborhoods in a semi-urban city of the southeastern United States during the Spring of 2014. Audio recordings were transcribed verbatim by trained research assistants. Using grounded theory and an ecological perspective the primary author completed emergent coding to generate initial categories. Multiple research assistants then performed both open and axial coding to achieve consensus on themes.

Results/findings:

A total of 76 [predominantly older (m=61 yrs.), African American (95%), and female (72%)] residents participated in the study. Participants self-defined healthy eating as the consumption of fruits and vegetables, and avoidance of high fat and processed foods. Most participants understood the importance of healthy eating for preventing chronic disease and discussed several barriers, including lack of access to fresh fruits and vegetables, presence of unhealthy, convenient, and inexpensive options, and preferences for 'traditional' unhealthy recipes. However, almost all neighborhoods had community gardens and residents positively reported that these provide opportunities to educate future generations about healthy eating, access to free vegetables, and positive interactions with other residents in their community, including the sharing of healthy alternatives for traditional recipes.

Conclusions:

Dietary patterns were attributed to both individual and community level factors. At the neighborhood level, community gardens may provide structural support for healthy eating, while simultaneously educating future generations and increasing health-enhancing social interactions among neighbors. Overall, the data suggest community-level interventions, including the implementation of community gardens, may be effective in increasing healthy eating among residents of low-income neighborhoods.

P2.56

Quality of Fruits and Vegetables Using the Nutrition Environment Measurement Survey (NEMS) is Lower in More Rural Locations

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Understanding how rural food environments impact dietary options for residents is an important factor in designing interventions that improve the health outcomes of rural communities. The purpose of this study is to conduct an observational assessment of availability of food options, price, and produce quality offered in rural communities throughout Montana.

Methods: The Nutrition Measurement Evaluation Survey in stores (NEMS-S), previously tested for reliability and validity, was used to assess the availability of food options, price, and produce quality offered in rural food outlets in Montana. Data were collected from January 2014 to November 2014. Descriptive analyses were used to examine store characteristics, county data, and NEMS-S scores. Overall p-values for differences in NEMS-S scores by 2013 Rural-Urban Continuum Codes were obtained using Kruskal Wallis exact test and significant differences were noted. Statistical significance was set at a two-sided alpha level of $P < 0.05$.

Results: The sample consisted of 20 stores in 17 communities throughout Montana. Fifteen percent of food stores ($n=3$) were in a metro area and 85% ($n=17$) were in nonmetro areas. The average total NEMS-S score was 24.4 ± 8.6 (out of a possible total score of 50). The average total availability score was 17.4 ± 6.5 (out of a possible availability score of 27), the average total price score was 3.0 ± 2.7 (out of a possible price score of 17), and the average total quality score was 4.6 ± 2.0 (out of a possible quality score of 6). There were significant differences by NEMS-S quality scores, but no significant differences were found in availability or price. Stores located in more metro areas (specifically, metro or nonmetro with an urban population of 2,500 to 19,999 that were adjacent to a metro area) received the highest NEMS-S produce quality scores ($M=5.7-6.0$, $SDs=0.6-0.0$), which were significantly higher than the more rural communities ($M=3.5-3.7$, $SDs=1.3-3.2$).

Conclusions: Quality of produce may impact the likelihood that consumers in rural food environments select, purchase, and consume fruits and vegetables, ultimately impacting nutrition-related health outcomes for residents of rural communities.

P2.57

Full Restaurant Evaluation Supporting a Healthy (FRESH) Dining Environment Audit

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SIG: Yes, Policies and environments

Awards: No

Objective: Development, testing and interrater reliability of a simplified dining healthfulness audit.

Methods: The FRESH audit assesses dining halls/cafeterias (DH), fast food (FF), sit-down (SD) and delivery restaurants. Each item criterion was scored using a five-point semantic-differential scale, a score of "1" provided little or no support for selecting healthy foods, and "5" provided high support for healthy food selection. Items include: menu descriptions; food preparation; healthy foods availability: lean meats, vegetarian, fruit, vegetable sides, whole grains, cereals, salad bar, desserts, and beverages; nutrition information, substitutions, condiments, signage/posters, menu/board labeling, portion/cup sizes, pricing, accessibility, and sustainability. FRESH was pilot-tested with experts/users to improve conceptualization and wording. Research assistants completed video training, practiced and performed interrater reliability before collecting data via Qualtrics. Data were analyzed using confirmatory factor analysis, inter-class correlations (ICC), and non-parametric statistics.

Results: There were 421 dining venues (11.6% DH, 45.8% FF, 36.3% SD, 6.2% delivery) evaluated. ICC results were appropriate [.730 to .993]. Confirmatory factor analysis showed adequate fit with chi-square of 636.342 ($n=421$, $df=187$), $p < .001$, Comparative Fit Index value of .900, and a root mean square of approximation of .076. Healthfulness of foods subscale (HEFS) included 12 items ($\alpha=.813$) (total potential points=60) and dining environment supports (DESS) included 10 items ($\alpha=.753$) (total potential points=50). Five items were eliminated. Average HEFS scores for DH, FF, SD, and delivery; were 42.36 ± 10.40 , 20.97 ± 7.33 , 21.41 ± 5.22 , and 16.92 ± 4.35 , respectively. Average DESS scores for DH, FF, SD, and delivery; were 33.14 ± 7.50 , 24.44 ± 5.83 , 22.77 ± 4.63 , and 16.96 ± 4.30 , respectively. For high/medium/low healthfulness scores, there was a significant difference between venues for HEFS scores $\chi^2(df=6, n=421)=107.783$, $p < .0001$ and DESS score $\chi^2(df=6, n=421)=98.550$, $p < .0001$. Of note, 91.8% HEFS and 79.6% DESS of DH had higher scores, whereas SD and FF were more evenly distributed. For the final audit, six items (i.e. portion sizes, substitutions) were revised to an additive score of all applicable categories to better capture the reality/diversity of dining environments.

Conclusions: This simplified FRESH Dining Environment audit effectively assesses the healthfulness of the foods and the environmental supports, and allows for comparison between FF, SD, DH and delivery dining venues.

P2.58

How do Healthy Eating Index Scores Translate to What Parents Pack for Their Preschooler's Lunches

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SIG: Yes, Early care and education

Awards: No

Objective:

The purpose of this study was to examine the food combinations that made up parent-packed preschool children's lunches when grouped by their Health Eating Index (HEI) Scores.

Methods:

This study examined lunches observed at baseline for the «Lunch is in the Bag» cluster randomized controlled trial in Central TX, USA. Individual lunches were packed by parents of preschool aged children who attended full time child care. Lunch contents and child consumption were observed and recorded for two non-consecutive days. Food was coded and nutrients calculated using the Food Intake and Analysis System (FIAS). HEI total and component scores of lunches packed were estimated with three-level regression models that controlled for central-level clustering, and repeated measured for each child; all models were adjusted for child age, sex and BMI.

Results:

Data were collected at baseline from 607 parent-child dyads from 30 early care and education centers. Mean and SE for HEI-2010 total scores were 58 ± 0.9 and 52.3 ± 0.9 out of a possible 100 points for lunches packed and consumed, respectively. The HEI scores ranged from 14.02-91.6. Only 8.5% of meals scored ≤ 40 points, 20.9% of meals scored ≥ 80.0 while 70% of the lunches falling between 40 and 80. Only 13.5% of children consumed a lunch with a score of ≥ 80 while 21.6% consumed a lunch with a total score of <40 .

Conclusion:

Children's lunches exhibited a wide range of HEI scores and low HEI total scores may represent poor choices by parents packing the lunches. Considering the range of nutritional aspects that the HEI 2010 measures parents may need a broader understanding how to pack a meal of good dietary quality for their child. The HEI 2010 may offer a way to educate parents on food choices for their child.

P2.59

Severe housing cost and obesity among low-income preschool children in Los Angeles

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective: More than 40 million households in the United States are burdened by housing costs (spending $> 30\%$ income on housing), including nearly 20 million who are severely burdened ($>50\%$ income). While unaffordable housing has begun to be explored as a risk factor for health, little is known about its impact on obesity among children, especially low-income children who are already at increased risk of obesity. Financial difficulty to pay for housing may be a risk factor for child obesity through decreased financial resources for healthy food, living in unsafe neighborhoods where children cannot play, and parental stress and poor mental health. We therefore investigated the association between severe housing cost and obesity among low-income preschool children and will examine child's diet, physical activity, and mother's mental health as possible mediators.

Methods: We used data from three triennial surveys (2005, 2008, 2011) of participants of the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Pregnant, breastfeeding, and postpartum women and infants and children less than five years old who are low-income and at nutritional risk are eligible to participate in WIC. The surveys are conducted on a random sample of approximately 5500 WIC families in Los Angeles County. We used logistic regression to examine the association between child's obesity status and severe burden of housing costs. Obesity was defined as a body mass index (BMI)-for age and sex ≥ 95 th percentile. A family was considered to be severely burdened with housing costs if they perceived it to be very difficult to pay for housing.

Results: Approximately 20% of children lived in families that were severely burdened with housing costs. Adjusting for child's age and gender, and mother's education, race and BMI, living in a family severely burdened by housing cost significantly increased the odds of child obesity [OR (95%CI) = 1.44 (1.06; 1.96) for 2005, 1.17 (0.84; 1.61) for 2008, and 1.34 (1.01; 1.77) for 2011].

Conclusion: Increasing the availability of affordable housing for low-income populations should be considered in the fight against obesity, and in maternal and child health policies aiming to promote children's health and well-being.

P2.60

Involving children in cooking: why does it work?

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SIG: Yes, Children and families

Awards: No

Objective:

Involving children in food preparation can be an opportunity to develop children's healthy eating habits. Data from two studies will be presented to explore the effect of children's involvement in meal preparation on children's food intake and potential factors that may contribute to the effects.

Methods:

The first study was a cross-sectional survey among 305 parents exploring 6-12 year old children's eating behaviors. The second study was an experiment with 47 children aged 6 to 10 years. In condition 1 (n=25), children prepared a lunch meal with assistance of the parent. In condition 2 (n=22) the meal was prepared by the parent alone. Before and after the experiment the Self-Assessment Manikin (SAM) was used to assess children's emotions (self-report). A follow-up survey was sent to all participants in the experiment to evaluate whether they changed behaviors after the experiment and to examine parent attitudes and barriers towards cooking with children.

Results:

Survey results revealed cooking enjoyment, eating enjoyment and parental pressure to eat were associated with children's eating behaviors. In the experiment, children in the "child cooks" condition ate significantly more salad 41.7 g (76.1%), chicken 21.8 g (27.0%), and calories 84.6 kcal (24.4%) than children in the parent cooks condition. The children who cooked significantly increased in "positive feelings" and "confidence" emotions compared to children who did not cook. The follow up survey results showed that parents in the "child cooks" group were more likely to involve their child in home food preparation compared to parents who were in the "parent cooks" group. Parents reported "spending time together" most frequently (84%) as a benefit of cooking together with the child.

Conclusions:

Encouraging parents to involve their children meal preparation could be a valuable intervention strategy to improve the diets of children. The two studies indicated that both that the family context (spending time together, pressure to eat) and child emotions such as positive feelings and confidence could contribute to the effects of cooking on intake. The role of emotions and factors such as choice, positive cooking and eating context and having sufficient cooking skills will be discussed.

P2.61

Measuring self-report and objective physical activity in a web-based survey: An overview.

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SIG: Yes, Cancer Prevention and Management

Awards: No

Objective: Few studies have attempted administration of a web-based survey that also utilized a physical activity (PA) monitor protocol and evaluated different incentive offers to participants. This study describes the results of new public-use resource that contains objective and self-reported PA data.

Methods: FLASHE is a cross-sectional, web-based survey of the multilevel correlates of cancer preventive health behaviors with an emphasis on diet and PA. It used a consumer opinion panel to recruit parent-teen (12-17 years) dyads from across the US. FLASHE includes an online self-report PA measure (Youth Activity Profile [YAP]), and a new adaption of the YAP for summer-time PA assessment. The YAP measures both in- and out-school PA and sedentary behavior, which are described in Presentation 3. A subsample of teens were randomized to receive a wrist-worn Actigraph GT3X physical activity monitor to wear for 7 days. These teens were further randomized to receive either a \$20 or \$40 stipend upon return of the monitor. Data was collected between April-October 2014. Data processing of the GTX3 was done using the R-code described in Presentation 2. Advanced YAP calibration algorithms (described in Presentation 3) were also created using GTX3 and survey demographic data.

Results: Of the n=5027 invited to participate in the FLASHE study, two-thirds (n=3326) were randomized to the Survey Only (SO) arm, while a third (n=1701) were allocated to the Survey + Motion Study (MS) arm. Of those randomized to the SO and MS arms, n=1251 and n=693 enrolled, respectively, (n=1944 dyads enrolled, 38.7%). Overall in the MS arm, 90.9% (n=630) of the monitors were returned and of these participants, 90.3% (n=569) completed a corresponding survey. An additional n=1111 surveys (88.8%) were completed by teens in the SO arm.

Conclusion: FLASHE is one of the first web-based surveys to include accelerometry suggesting the feasibility of remote deployment of a motion sensing protocol. FLASHE allows for harmonization of PA data obtained from teens sampled in and outside of the school year and for those with and without accelerometry assessment. Future research will evaluate the influence of the different incentive offers.

P2.62

Creating effective partnerships between parents and child care providers to support child health - insights from parent focus groups

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SIG: Yes, Early care and education

Awards: No

Purpose: To explore parents' views around raising healthy children in the areas of nutrition and physical activity, and developing partnerships with child care providers.

Methods: Four focus groups were conducted with parents of 3- to 4-year old children (n=20) and three with child care providers (n=17), all from central North Carolina (USA). Focus group guides were developed to prompt discussion of how parents (and providers) try to instill healthy habits, how their own behaviors influence the child, and the usefulness of parent-provider partnerships around child health. Discussions were recorded and transcribed with transcripts independently review by two team members to identify themes.

Results: Parents were primarily white (70%) or African American (25%), with a household income \geq \$60,000 (65%), and bachelor's degrees or higher (50%). Parents recognized healthy eating, physical activity, sleep and hygiene as important health habits to instill in their children. Such habits were seen to support the development of the "whole child" - benefiting physical health, emotional health, mental health, self-control and happiness. Parents were mixed in their confidence to teach healthy eating, citing challenges like cost of food, lack of time, personal preferences, conflicts over food, and eating schedules. Many parents expressed guilt over not consistently doing what they knew they should to promote healthy eating. Parents often prioritized role modeling of healthy eating over physical activity, due in part to perceptions that children were already very active and that lack of energy, scheduling, and natural ability were barriers. Parents recognized the importance of parent-provider partnerships, and noted they often tried to capitalize on things introduced at preschool to encourage healthy eating and physical activity at home. However, careful communication appeared to critical for successful partnerships, with parents being more open to general health recommendations distributed school-wide than personal references which raised concerns about feeling singled out or judged. Discussions with providers illustrated they understood those parent perceptions and feelings.

Conclusions: Having consistent messages around healthy eating and physical activity at home and child care should reinforce children's adoption of these behaviors. While there is great potential for parent-provider partnerships, careful communication is critical for success.

P2.63

Parental perspectives on implementation of a school based parental support programme to promote healthy dietary and physical activity behaviours in a low socioeconomic setting

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose:

There is limited research regarding barriers and facilitators of parental support programmes targeting diet and physical activity. Groups with low socioeconomic status (SES) have higher needs of overweight and obesity prevention than the population in general and are also more difficult to reach in health interventions. The aim of this study was to describe parents' perspectives on barriers and facilitators to implementation of a parental support programme promoting healthy dietary and physical activity behaviours in areas with low SES.

Methods:

Four focus groups were conducted with 16 parents who participated in the programme. Data was collected from October to December 2013 and analysed using qualitative content analysis.

Results:

Preliminary results suggest that when parents viewed the contents of intervention components as either too simple or too complicated it made them indifferent to the intervention. Lack of cooperation between parents as well as parents' lack of time in their everyday life influenced the implementation negatively. If parents had too little knowledge, it made them insecure and a lot of knowledge made the parents indifferent to the programme. Parents' inability to act as role models for their children in certain programme activities appeared as a barrier whereas a perceived need of working with dietary and physical activity had a positive influence on the implementation. Parents indicated that when there was a discrepancy in norms and practices regarding diet and physical activity between school and home, it affected the programme implementation negatively.

Good cooperation between home and school seemed important to parents. If teachers failed to conduct the programme as recommended, the parents described this as a barrier, whereas the opposite was perceived as facilitating implementation according to the parents.

Conclusion:

It seems important for a parental support programme targeting low SES groups to include components that are flexible in complexity regarding both activities and information in order to tailor to the variation in ability, needs, knowledge and time constraints among the families. It also seems important to target cooperation between parents as well as between parents and schools.

P2.64

Science of Implementation for Physical Activity Promotion: Perspectives from the Field

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SIG: Yes, Policies and environments

Awards: No

Background: Efficacious childhood obesity treatment programs exist but have not been translated into typical practice and are absent in medically underserved areas. System-based approaches are recommended as a method to improve the implementation of evidence-based strategies into regular clinical practice.

Purpose: (1) To describe the development of the Partnering for Obesity Planning and Sustainability Community Advisory Board (POPS-CAB) using a systems-based approach to reduce childhood obesity in a medically underserved region and (2) to describe the selection of an evidence-based physical activity and nutrition program that would support family efforts to reduce obesity.

Methods: A mixed-methods case study on the identification of key partners in the region that would contribute to identifying and engaging families in a lifestyle intervention. The RE-AIM framework guided this planning. The partnership reviewed 3 programs (Traffic Light Diet, Bright Bodies, Home Environment Change Model; HECM) that each demonstrated short and longer-term efficacy. POPS-CAB members provided quantitative ratings of the programs on a 5 point-likert scale (1= low, 5=high ratings). Qualitative discussion related to POPS-CAB member perceptions of the programs.

Results: The POPS-CAB included local public health, healthcare, and recreation partners that committed to participating in the identification, adaptation, and implementation of a childhood obesity program. This approach included horizontal and vertical aspects of the community system and included multiple organization support (horizontal) and organizational delivery staff and decision makers (vertical). Bright Bodies had the highest rated program characteristics (4.1 vs 3.7 vs 3.7) and likelihood of adoption (3.9 vs 3.3 vs 3.3) while the HECM was ranked highest on ease of implementation/adaptation (3.9 vs, 3.6 vs 3.1). Qualitatively the primary themes of discussion were, (1) the importance for the chosen program to have a balance of nutrition and physical activity, (2) negative perceptions of calorie counting, (3) a desire to target both the parent and the child, as well as (4) the need for practicality and usability.

Conclusion: Multiple organizations and levels within organizations were critical to the planning process. Program selection decisions were related more to the program content, delivery channel, and available resources for replication rather than ease of implementation or resources needed.

P2.65

Acceptability and feasibility of a mobile-based ecological momentary assessment for nutrition and physical activity among emerging adults: Findings from the SPARC pilot study

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SIG: Yes, e- & mHealth

Awards: No

Purpose: Mobile-phone based ecological momentary assessments (mEMAs) provide an opportunity for real-time data collection, which may reduce bias and participant burden associated with other measurement approaches while efficiently capturing information such as time, place, psychological, and social factors related to behaviors. Emerging adulthood (ages 18-25) is marked by major shifts in nutrition and significant contextual changes; however, few studies have used EMA to assess eating behaviors and physical activity (PA) during this stage in the life course.

Methods: A diverse sample of emerging adults (n=36; mean age=22.4; 62% female; 52% non-white) attending a southwestern US university participated in a pilot study that included one 4-day wave of mEMAs. Participants used the devilSPARC app installed on their personal mobile phone (Android or iOS) to assess nutrition, PA, and sedentary behaviors and the social and physical contexts in which the behaviors occurred in real-time. Using a random block approach, participants completed up to 32 mEMA questionnaires (prompt frequency=8/day, up to 9 questions on behaviors and social contexts). After the 4-day data collection period, surveys and interviews were conducted to assess the mEMA app's acceptability and feasibility.

Results: Preliminary qualitative assessments indicated high acceptability of the devilSPARC mEMA: 88% reported the app was fast and easy to use. Most participants (84%) reported that the mEMA took less than 1 minute to complete. Overall compliance across the 4-day wave of 32 prompts was 61.5% (median=65.6; range 31.2-84.5%). There were no significant differences in compliance by age, gender, race/ethnicity, or weight status. The devilSPARC mEMA captured nutrition and PA behaviors moderately well. Participants reported being sedentary most often (51.4% of mEMA responses). Eating behaviors were the next most common reported behavior (17.5% of the responses), with entrees (7.4%) and fruits/vegetables (8.9%) reported most frequently. PA was reported 16.0% of the time; a total of 8.5% of the mEMA responses included moderate/vigorous PA.

Conclusions: Implementing EMA on personal mobile devices is a feasible and relatively acceptable method of assessing real-time behavioral data with emerging adults. Retrospective questions may be needed in order to capture relatively rare behavioral episodes such as eating and physical activity.

P2.66

Lifestyles, dietary habits and market activities of female traders, South East Nigeria.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: To assess lifestyle, nutritional status, market and physical activities of female traders in Umuahia main market.

Methods: A pre-tested questionnaire was used to obtain information on socio-demographic characteristics, dietary habits, market and physical activities of 240 randomly selected female traders. Anthropometric measurements were used to assess the Body Mass index (BMI) and waist hip circumference ratio (WHR). Food frequency questionnaire was used to obtain information on the frequency of consumption of common foods. Data were analyzed using SPSS 17.0.

Results: About 28.3% of the respondents were within the age group of 30-39 years. More than half (55%) resume in the market between 6.30am and 7.00am. One third (36.7%) of the women go to the market six times a week. Market activities of 40% of the traders mainly involved sitting and selling their wares. About 46.7% perceived they were physically active during market hours, while 30% perceived their condition in the market to be very stressful. Green leafy vegetables (41.52%), baked products (40.36%) and roots/tubers (38.33%) were the main food groups consumed at least twice a week. Consumption of alcohol twice a week was 51.7%. BMI classification showed that 25% and 31.7% were overweight and obese, respectively. There was a significant positive association between BMI and snack consumption ($r=0.3313$; $p<0.05$).

Conclusion: Prevalence of obesity was high. Market and physical activities of the traders could be regarded as sedentary. Awareness campaigns on need for regular exercise should be emphasized in market places.

P2.67

Using the Intervention Mapping Protocol to develop an online video intervention for parents to prevent childhood obesity: Movie Models

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SIG: Yes, Children and families

Awards: No

Purpose: Since parents play a major role in the energy-related behaviors of their child, we aim to develop, implement and evaluate a theory- and evidence-based intervention for parents to prevent childhood overweight and obesity through the improvement of parenting practices. The aim of this manuscript was to describe the systematical developmental process of this intervention.

Methods: The Intervention Mapping Protocol was used to develop an intervention for parents to obtain healthy behavior and prevent overweight and obesity in primary schoolchildren through the improvement of parenting practices.

Results: The application of the six different steps in the Intervention Mapping Protocol resulted in an overall intervention framework targeting specific parenting practices related to children's diet, physical activity and sedentary behavior and its corresponding parental self-efficacy through online videos. A plan was developed to evaluate program effectiveness and quality of implementation.

Conclusions: The current project used the Intervention Mapping Protocol to develop an online video-based intervention to improve parenting practices and children's health behaviors and to prevent overweight and obesity in the long run. The manuscript provides a clear framework for process analyses, increases the potential effectiveness of the intervention and can be useful for future intervention developers.

P2.68

Shifting Gears: The impact of a healthy choices smartphone intervention on chronic disease risk factors in Australian truck drivers

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: *Shifting Gears* is an Australian funded lifestyle intervention that uses smartphone technology to help truck drivers monitor and self regulate active living and healthy diet choices. This study examined the impact of the smartphone intervention on chronic disease risks in drivers.

Methods: Participants (44 men; 47.5±9.8 years) completed a baseline health survey (physical activity, diet choices and workday sitting) and a physical examination (height, weight [used to calculate body mass index], waist circumference and blood pressure) in April 2014. These drivers then attended an educational workshop and implemented an active living and healthy diet program over five months. To facilitate healthy choices, drivers were offered a free *Jawbone* wristband and access to an interactive smartphone application (*UP*); the application synchronises with the wristband to upload daily step counts, allows users to manually input or barcode diet choices, and to virtually connect with other users. Survey and physical measures were repeated at the end of the intervention (October 2014) and median (physical activity) and mean (all other variables) changes in chronic disease risks relative to baseline analysed using a Wilcoxon signed ranks test and paired samples t tests.

Results: Twenty two drivers (or 50% of the baseline sample) failed to transition to the end of the intervention; smartphone technological barriers were cited as the main reason for drop out. For completers, significant positive changes ($p < 0.05$) were found for physical activity (baseline=250 [IQR 595] METmins week⁻¹; end-intervention=674 [IQR 2,464] METmins week⁻¹); diet choices (baseline=4±1 serves of fruit and vegetables/day; end-intervention=5±1 serves/day); and systolic blood pressure (baseline=143.3±11.6 mmHg; end-intervention=130.6±15.6 mmHg). Non-significant improvements were found for workday sitting time (baseline=8.9±2.9 hours/day; end-intervention=8.2±3.0 hours/day) and waist circumference (baseline=109.8±9.8 cm; end-intervention=108.8±10.0 cm). Non-significant negative changes were observed for body mass index (baseline=31.6±4.4 kg/m²; end-intervention=32.1±4.8 kg/m²) and diastolic blood pressure (baseline=88.3±9.8 mmHg; end-intervention=92.0±9.3 mmHg).

Conclusions: *Shifting Gears* had a positive impact on some but not all chronic disease risks in truck drivers who completed the *Shifting Gears* program. The findings highlight the intervention potential of smartphones, but also the importance of considering smartphone technological barriers that may discourage intervention engagement in this occupational group.

P2.69

Parenting style and family contributors to development of obesity in Arab children ages 6-10 years old and living in urban Texas

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

To investigate Arab mother parenting styles compared to other racial groups and to assess the relationships between these parenting styles, home obesogenic environment and behaviors, and child's body mass index (BMI).

Methods:

In this descriptive study, 23 Arab mothers of 37 children ages 6-10 years old completed the Participant Background Survey, the Caregiver's Feeding Styles Questionnaire (CFSQ) and the Family Nutrition and Physical Activity (FNPA) Assessment. Descriptive statistics of Arab mothers' responses to the Participant Background Survey were calculated. Demandingness and responsiveness were derived from CFSQ scores, and mothers were categorized into four parenting styles. To assess obesogenic family environments and behaviors, FNPA score means were calculated. Pearson and Spearman correlations were used to test the associations between the different feeding styles, home obesogenic environment and behaviors, and child's BMI z-scores.

Results:

Most of Arab mothers (mean age= 38.4 years) were nonworking and had been in the US more than 15 years. Although all Arab mothers reported that they were authoritative, only seven mothers were categorized as having authoritative feeding style based on their CFSQ scores on demandingness and responsiveness. Overall, Arab mothers scored lower on demandingness (median= 2.84) and responsiveness (median= 0.96) than previous reports for African Americans, Caucasians, and Hispanics. The FNPA mean was 3.18 indicating less obesogenic family environment and behaviors. In Pearson and Spearman correlation analyses, no significant associations were found between reported feeding styles, obesogenic family environments and behaviors, and child's BMI z-scores. However, several items within the two surveys were correlated. Highest correlations were found between the "ask the child questions about the food during dinner" and the "suggest to the child that he or she eats dinner" items ($r = .694, p < .000$) in CFSQ; and the "television usage" and the "restriction and reward" items ($r = .783, p < .000$) in FNPA.

Conclusions:

This study can be used as a guide in assessing parenting style, environment, and family issues regarding dietary and physical activity behaviors of Arab families as a first step to developing effective nutrition education programs for mothers with Arab ancestry.

P2.70

Motivators and barriers to engaging in healthy eating and physical activity in young adult men.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Internationally, young men (aged 18-25 years) have a high prevalence of overweight and obesity and many fail to meet recommended levels of physical activity or dietary guidelines. There is a lack of engagement and understanding of young men's needs in health-related research. Therefore, this study aims to explore young men's motivators and barriers to engaging in healthy eating and physical activity (PA).

Methods: Ten focus groups (~45 minutes; 3-9 participants/group) were conducted in 61 men (BMI: 25.3±5.1, Age: 18-25yrs) from the Hunter region, NSW, Australia. Three groups comprised healthy weight (HW) participants, three groups comprised overweight/obese (OW/OB) participants, while four groups included mixed-BMI participants. In total there were 35 (57.4%) HW men and 26 (42.6%) OW/OB men. Four open-ended questions established motivators and barriers. Sessions were audio recorded and transcribed. Data analysis was conducted by an independent qualitative researcher using NVIVO10.

Results: Motivators: OW/OB and HW young men perceived similar factors as motivators for adopting healthy eating patterns, with equal attention given to physical health aspects (e.g. to live longer) and social or intrinsic factors (e.g. sexual attractiveness). BMI status had little impact on types of motivating factors perceived to underpin engagement in PA. Amongst the most frequently mentioned were factors relating to physical appearance and social inclusion. Barriers to eating healthy addressed three general categories; those intrinsic to the person (e.g. lack of motivation), logistics (e.g. cost), and social factors (e.g. peer influence). Differences between BMI groups were identified for some intrinsic factors (e.g. Lack of knowledge was only mentioned by HW). Barriers to undertaking PA included lack of priority or value attached to PA (e.g. lack of time), logistical factors (e.g. cost) and personal insecurities (e.g. feelings of inadequacy). Often HW participants discussed barriers hypothetically, perhaps suggesting higher actual PA involvement amongst these participants, whilst OW/OB participants often discussed barriers in a more personal context.

Conclusion: Future research involving young men should include strategies to promote the physical, social and intrinsic benefits of PA and healthy eating. Addressing key barriers such as lack of motivation, time constraints and cost may be used to engage this target group.

P2.71

DOES THE ANALYSIS METHOD USED IMPACT FINDINGS OF COMBINED DIET AND PHYSICAL ACTIVITY BEHAVIOUR CHANGE INTERVENTIONS?

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Interventions targeting both physical activity and dietary behaviours offer the potential of increased health benefits, maximised health promotion, and reduced costs. Traditionally, such trials have reported changes for each behaviour separately. However, focusing on single risk factors, increases the chance of a type II error and does not estimate the overall effect of the intervention. The Exercise and Nutrition Routine Improving Cancer Health (ENRICH) intervention is a health promotion program for cancer survivors and carers that targets several aspects of physical activity and diet. This presentation uses data from the ENRICH two-arm pragmatic randomized controlled trial (n=174) to explore the differences in interpretation of results using four different analysis approaches.

Methods:

We analysed the ENRICH data by:

- 1) reporting change for each behaviour separately
- 2) calculating a summative index (assigning a point for each behaviour that meets the recommendations) and calculating the change in index scores
- 3) creating a combined change score (a z-score calculated to standardise change in behaviours such that categorical and continuous variables can be combined into one score)
- 4) modelling an optimal linear combination of multiple behavioural risk factors, including interactions between risk factors

Results:

We will present the results of the four different analyses. Method 2 (summative) is useful for examining the ability of the intervention to encourage participants to meet lifestyle recommendations for cancer survivors. Methods 3 (z-score) and 4 (linear combination) allow us to look at a change in each behaviour on a continuous scale in order to assess incremental changes.

Conclusion:

The analysis and interpretation of the ENRICH trial using each method will be discussed, highlighting important similarities and differences between the methods. Our results provide practical considerations to researchers to guide their decision in the selection and interpretation of appropriate evaluation methods for trials targeting change in more than one behaviour.

P2.72

Parents' weight management behaviors and childhood obesity

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: For most children, parents serve as "nutritional gatekeepers", which means they largely control what and how much their child eats. The importance of this influence harnesses in childhood obesity: Interventions targeted at a child's obesity do not need to involve it to be effective - it suffices to intervene through the parents. This study investigates parents' weight management behaviors and their relationship to body weight and eating habits in children, when controlling for physical activity.

Methods: Participants were 25 parents of children between the age of 6 to 12 (Study 1); and 300 parents of children representative for the German population (Study 2). Portion size estimation skills were measured with a set of validated food pictures. Numeric competencies (i.e. objective and subjective numeracy scale, symbolic-number mapping) were assessed with validated tools. In both studies, parents completed a survey on nutrition labels and growth charts. In Study 1, parents reported weight and height of their child; in Study 2, parents and children were weighed and height was self-reported.

Results: Results of Study 1 demonstrate that parents' lower numeracy was associated with a higher BMI of the target child ($r = -.26$). Further, higher objective numeracy was related to better portion-size estimation skills ($r = .30$), nutrition-label comprehension ($r = .40$), and growth-chart comprehension ($r = .21$). Study 2 is currently being analyzed.

Conclusion: The results show that parents' numeracy skills are related to their children's body weight. Parents' ability to accurately estimate portion sizes and to understand food labels and growth charts may partly account for this link. The present findings, if repeated in Study 2, offer a first step towards identifying novel preventions or interventions targeted at parents to fight childhood obesity.

P2.74

Physical activity and diet promotion practice among family practitioners in Qatar

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Many health care organizations have recommended clinical guidelines for promoting healthy lifestyles in primary care as a part of prevention or treatment of chronic diseases. This study aims to measure the level of health promotion practice related to physical activity and diet among family physicians in Qatar.

Methods: A cross-sectional questionnaire survey of a randomly selected sample of 118 family physicians was conducted. The main outcome measures included: promoting healthy diet, and physical activity through advice, screening, counseling, or clinical management.

Results: The percentage of physicians giving advice routinely was 82% for healthy diet and 28.6% for physical activity, and these percentages are raised slightly if the patient has a lifestyle related comorbidity such as diabetes and lipid disorders. Only 12% of physicians reported that they used to counsel their patients for lifestyle modification. Only 13% of physicians have received training in lifestyle intervention. Physicians who are regularly active are more likely to promote physical activity.

Conclusions: Although promoting physical activity and healthy diet is one of the key roles of primary care physicians, the current practice rate remains low. More training and organizational change are required for physicians in order to contribute effectively to promote diet and physical activity.

P2.75

Liking and wanting for fat and savoury taste in relation to gastric emptying in active and inactive males

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Habitual exercise could contribute to weight management by altering processes of food reward via the gut-brain axis. We investigated hedonic processes of food reward ('liking' and 'wanting', food preferences) in active and inactive males and characterised relationships with gastric emptying.

Methods: Forty-four males (Active: n=22, mean±SD BMI, 24.5±2.6 kg/m²; Inactive: n=22, BMI, 27.4±4.2 kg/m²) were studied. Participants were provided with a standardised fixed breakfast and 5h later an *ad libitum* pasta lunch. Explicit liking, implicit wanting and food preferences were assessed immediately post-breakfast and again pre-lunch using the Leeds Food Preference Questionnaire. Gastric emptying was assessed by ¹³C-octanoic acid breath test.

Results: Active individuals had a greater recovery in liking for savoury foods between post-breakfast and pre-lunch compared to inactive individuals (p < 0.05). Gastric emptying half-time was negatively correlated with liking for savoury foods and with the increase in liking for savoury foods between post-breakfast and pre-lunch (p < 0.05). In addition, gastric emptying was positively correlated with implicit wanting for high fat foods (p < 0.05). Further, there was a significant (p < 0.05) interaction between Activity group and gastric emptying on liking for high fat foods.

Conclusions: Active and inactive males differ in food hedonics. The rate of gastric emptying may have a role in food hedonics via the gut-brain axis.

P2.76

Parents of Preschoolers: Obstacles and Enablers of Obesity-Prevention Practices

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Little is known about the obstacles and enablers of obesity-prevention practices faced by parents of preschoolers. Thus, to inform the development of the in-home obesity prevention program HomeStyles, this study explored evidence-based factors affecting key weight-related practices (eating breakfast, fruit/vegetable intake, sugar-sweetened beverage intake, portion sizes, child feeding practices, active play, screentime, sleep) in both English and Spanish speaking homes.

Methods: Parents of preschoolers (n=138) completed surveys and participated in ~1 hour focus group interviews conducted by trained researchers. Standard content analysis procedures were used to identify trends and themes in the focus group data.

Results/Findings: Most (80%) parents ate breakfast daily, ate >2 different vegetables and fruits 5.2±1.8 and 4.6±2.0 days/week, drank sugary beverages 2.7±2.5 days/week, and played actively 4.2±2.2 hours/week with their preschoolers, who watched television 2.4±1.7 hours/day. Some parents reported healthy feeding practices: about one-third (37%) encouraged children to eat by making food look nice or telling them 'food will make you strong' and few (2%) used rewards for eating as their primary practice. Most parents (90%) had a bedtime routine for their preschooler. Common obstacles to performing healthful behaviors included lack of time; neighborhood safety; limited knowledge of portion size, food preparation, or options for active indoor play; perceived cost of healthy foods; and picky eaters in the family. Influence of family members (e.g. spouse, grandparents) and cultural influences from parents' childhood were other obstacles. Enablers for performing healthful behaviors included knowledge of healthful behaviors, planning ahead, and introducing new foods and behaviors often in tandem with existing preferred foods and behaviors. Parents reported it was particularly useful to learn strategies other parents used to successfully make changes and overcome obstacles. Parents stated that whether healthy behaviors were performed depended mostly (positively and negatively) on time, cost, happiness, agreement of others in the home, and desire to maintain a calm home environment.

Conclusions: Study findings can enhance the effectiveness of future obesity-prevention interventions by offering participant-generated solutions for overcoming common obstacles faced by parents, providing insights for boosting effectiveness of positive enablers, and incorporating parent generated strategies for behavior change. Funding: USDA NIFA #2011-68001-30170.

P2.77

Acceptability and feasibility of evaluating the HAPPY (Health and Active Parenting Programme for early Years) intervention aimed at reducing infant obesity: Results from a feasibility randomised controlled trial

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SIG: Yes, Children and families

Awards: No

Purpose:

This study aimed to test the acceptability and feasibility of evaluating 'HAPPY' an evidence-based intervention aimed at reducing the risk of obesity in infants of overweight and obese mothers.

Methods:

A feasibility individually randomised controlled trial was conducted. 120 overweight and obese pregnant women (defined as Body Mass Index (BMI) $\geq 25\text{kg/m}^2$) were recruited in a maternity unit when they were 10-26 weeks gestation of pregnancy. Consenting women were allocated on a 1:1 basis to the 12 week HAPPY programme (6 sessions antenatal, 6 sessions postnatal: N=59) or usual care (N=61). Measurement took place at baseline (before randomisation) and when the infant was aged 6 months and 12 months, by researchers blinded to condition. Measures included: mother's BMI, infant's length and weight, physical activity and dietary assessment of both mother and infant. Feasibility outcomes were: recruitment rate, attrition rates, acceptability of randomisation and measurement tools, and acceptability of the intervention. Appropriate outcome measures for a full trial were explored. Intervention fidelity was assessed through observations and facilitator feedback. Focus groups and semi-structured interviews were conducted with mothers and facilitators to explore reactions to research methods, implementation, and the content of the intervention.

Results:

Recruitment rate of those screened with a BMI of ≥ 25 was 30% (120/396). Retention at 12 months was 66% for the intervention group and 75% for the control group. Of the 59 allocated to the intervention N=26 (44%) attended at least one antenatal appointment (attending on average 4.8 sessions), and N=18 attended at least one postnatal session (average 4.6 sessions). Participant and facilitator reaction to intervention content was positive overall, and fidelity to content was high. Group clustering was minimal; an adjusted effect size of 0.25 standard deviation weight score at 12 months (95% CI: -0.16-0.65) favouring the intervention was observed. No adverse events were reported.

Conclusions:

Recruitment and measurement of overweight and obese mothers is feasible. Women and facilitators found the intervention acceptable, although strategies to increase initial attendance are required. Findings suggests a phase III definitive trial is feasible and have provided important lessons to ensure initiation and attendance of the programme is optimised in the future.

P2.78

From data to action: A community-based participatory approach to respond to identified needs following an environmental assessment.

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: A community-academic partnership (Dan River Partnership for a Healthy Community; DRPHC) in a region experiencing health disparities completed a series of built environment studies that (1) leveraged publically available data to provide an objective assessment of the food and physical activity (PA) built environment; (2) conducted environmental audits of all food and PA outlets in the region; and (3) completed a region-wide health behavior surveillance survey. The purpose of this study was to evaluate the process of the identification of local strategies for action based on these studies.

Methods: A built environment subcommittee consisting of community representatives for all 3 counties in the study area engaged in an iterative qualitative process to identify community relevant strategies, using the Common Community Measures for Obesity Prevention (COCOMOs) as a guiding framework. The subcommittee aligned the DRPHC's health outcomes, food and PA data within the 24 COMOMOs evidence-based environmental-strategies for obesity. The relevance of each strategy was considered based on: 1) data identifying a need, 2) local efforts already underway, and 3) the fit of a given strategy to the DRPHC mission. Trained research staff collected all qualitative data by recording the discussions of the subcommittee and DRPHC meetings. Individual members (n=26) of the larger DRPHC completed a ranking activity in which they ranked the strategies, followed by group discussions of the rankings and another ranking of the strategies.

Results: Over 6 meetings, the subcommittee identified 13 COCOMOs strategies supported by data and relevant to local partners ranging from strategies that increased access to recreational facilities to strategies that addressed supermarket availability in underserved areas. The subcommittee then presented their recommendations to the larger DRPHC. Through small and large group discussions, DRPHC members then ranked the 13 COCOMOs strategies based on (1) interest/relevance and (2) winability (i.e., achievable; broad appeal across multiple sectors). Based on these ratings 5 strategies were selected for implementation, for example improving bicycling infrastructure and improving availability and affordability of healthy food.

Conclusions: A community-based, participatory research approach was successful at responding to local environmental assessments and identified evidence-based strategies to respond to community needs.

P2.79

Assessment of Peer-led Family-based Pediatric Weight Management Intervention: Behavioral Outcomes Among Low-income Ethnically Diverse Families

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SIG: Yes, Children and families

Awards: No

Objective: The aim of this study is to assess changes in family physical activity and nutrition behaviors among participants in a family-based pediatric weight management intervention targeting low-income ethnically diverse families with overweight children living in neighborhoods characterized as «food deserts». This approach focused on the family as a primary setting for behavior change and utilized a community capacity building approach through increasing social capital (training parents as leaders), social networks and social support within specific neighborhoods.

Methods: A mixed-method study design included pre-post quantitative assessment of changes in parent and child physical activity and nutrition attitudes and behaviors and qualitative assessment of barriers and facilitators of change. Standardized assessment tools including the California Healthy Kids Survey and California Nutrition Network Community Education Survey. Change in key nutrition and physical activity behaviors were assessed from baseline to 30 day follow-up. The *e.n.e.r.g.y.* program (Eating Nutritiously Exercising Regularly Growing 'Y'wisely), an evidence-based program, was implemented with five cohorts of families at two elementary schools in Vallejo, California from 2012-2014. Families were recruited from two school health clinics, school letters and through parent networks.

Results: Of 43 families and 87 children (mean age= 9 years of age) who participated in the program, 80% completed pre and post assessments. Although most indicators showed an improvement from pre to post-test only increased daily vegetables consumption demonstrated statistical significance (95% confidence, $p < 0.05$). At post-test, parents reported less consumption of "junk food", increased child exercising 1 hr. or more/day and parent exercising 3 or more times/week and decreased more than two hours of daily screen time for children. Parents reported the most significant barrier to healthier food choice was a limited food budget. Reports of program satisfaction highlighted the important role of parent health promoters as role models.

Conclusions: The family appears to be an important setting for motivating behavior change related to child physical activity and nutrition. Training parents as health promoters and program leaders may support behavior change over time by increasing the "cultural relevance" of programs and providing positive role models focused on healthy eating and active living.

P2.82

Who, what, when, where and why: a mixed methods pilot study of children's recess physical activity

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Schools have long been recognized as potentially effective settings for physical activity initiatives, particularly schoolyards during recess. However, it is still unclear how the different factors that influence physical activity during recess interact, which makes designing interventions promoting physical activity during recess difficult. The aim of this study was to test a mixed-methods approach to document the children's activity patterns during recess from the five W questions (who, what, when, where and why).

Method:

Data were collected during one week in June 2014 in a rural school in Denmark. Eighty-five children (grade 4-6) wore an accelerometer (ActiGraph GT3X) and GPS (Qstarz BT-Q1000XT) for up to five schooldays to objectively measure their physical activity patterns during recess. Sixteen of the children described and depicted their perceived activity patterns during recess in go-along group interviews, and during three days recess behavior was observed. The objective and subjective data were analyzed separately to answer the five W questions. GPS-derived locations (where) for grade and gender segregated (who) accelerometer assessed physical activity (what) were mapped in GIS. The subjective data were analyzed in two steps. As a first step a thematic analysis was used to define locations (where). Secondly we analyzed the physical activity pattern in each of the locations by answering the who, what and why questions.

Results:

From the subjective data we identified four main locations for activity: classrooms, indoor corridors, fields and schoolyard. However, the objective data also found activity in a bush area which the children were not allowed to use. According to the objective data most physical activity among both boys and girls took place on areas designed for soccer. While boys used the soccer fields for playing soccer we observed girls using a paved soccer area as a riding ground for a role play in which they pretended to be dressage horses.

Conclusion:

Using multiple methods in exploring children's activity patterns during recess is a valuable approach that does not merely duplicate data but also offers complementary insights and understandings that may be difficult to access through reliance on a single method of data collection.

P2.83

A Smartphone Application to Measure Physical Activity Using Sensor-Informed Context-Sensitive Ecological Momentary AssessmentGenevieve Dunton¹, Eldin Dzibur¹, Stephen Intille²¹University of Southern California, Los Angeles, CA, USA,²Northeastern University, Boston, MA, USA**SIG:** Yes, e- & mHealth**Awards:** No

Objective: Despite the advantages of objective physical activity monitors (e.g., Actigraph or smartphone accelerometers), these devices have high rates of non-wear, which lead to missing data. This study tested a smartphone application ("app"), which combined objective and self-report methods to measure physical activity using sensor-informed Context-Sensitive Ecological Momentary Assessment (CS-EMA). The app was programmed to trigger CS-EMA self-report surveys immediately after three types of events detected by the smartphone's built-in accelerometer: (1) Physical activity bout, (2) No activity bout (i.e., sedentary activity or smartphone non-wear), and (3) No data bout (i.e., device powered off). The objective was to describe the extent that the app could capture activities that would have otherwise been missed due to non-wear of a waist accelerometer.

Methods: A sample of 51 ethnically-diverse high school students in the U.S. (ages 14-18, 55% female) tested the app over 14 continuous days. In addition to the CS-EMA prompts, the app triggered signal-contingent (i.e., random) EMA prompts (up to 7 per day). EMA prompts asked "What did you do between (start time) and (stop time)?" (e.g., Reading/Homework, Eating/Drinking, Sports/Exercise)" with times inserted by the app based on information from the built-in smartphone accelerometer. Activity was also measured with an external waist-worn Actigraph accelerometer.

Results: On average, each participant received $n=23$ CS-EMA prompts (trigger types: 2 Physical activity, 10 No activity, 11 No data) and $n=85$ random EMA prompts across the monitoring period. The average compliance rate was 78% (range 27-97%). Actigraph non-wear periods (i.e., 30+ min of 0 activity counts) were more likely to occur prior to CS-EMA prompts triggered by no activity (33%) as compared with random EMA prompts (26%) ($p < .05$). On average, answered EMA prompts during Actigraph non-wear periods provided self-reported activity data for an additional 67 (SD = 77) min per day per participant. During this time, $n=40$ additional self-reported Sports/Exercise episodes (about 1 per child) were captured that would have been missed due to device non-wear when using the Actigraph alone.

Conclusions: Smartphone apps using sensor-informed CS-EMA are acceptable among high school students and may augment objective physical activity data collected from waist-worn accelerometers.

P2.84

Determinants, barriers and facilitators of change in preschool-aged children's physical activity: a systematic review of quantitative and qualitative evidenceKathryn Hesketh¹, Claire O'Malley², Veena Paes¹, Helen Moore², Simon Griffin³, Carolyn Summerbell², Rajalakshmi Lakshman³, Esther van Sluijs³¹UCL Institute of Child Health, London, UK, ²School of Medicine and Health, University of Durham, Durham, UK, ³MRC Epidemiology Unit, University of Cambridge, Cambridge, UK**SIG:** Yes, Early care and education**Awards:** No

Purpose: Numerous correlates of physical activity in preschool-aged children have been identified, yet conclusions about causality cannot be drawn from these studies. A systematic review was conducted to comprehensively appraise the published quantitative and qualitative evidence around determinants (a 'preceding, causal predictor') of change in, and barriers and facilitators to, physical activity in preschool-aged children, aged <6 years.

Methods: An extensive search was undertaken in eight online databases, yielding 164 articles which were read in full. Prospective quantitative studies investigating change in physical activity in children and qualitative studies exploring barrier or facilitators to activity were included. Studies in clinical populations and laboratory-based studies were excluded. The socio-ecological model was used to define the levels of influence on behaviour (i.e. individual; interpersonal; organisational; community; policy). Each extracted determinant, barrier or facilitator was given a score based on the direction (0, +, -) and strength of evidence of the association.

Results: 43 articles were included (prospective=6; intervention=16; qualitative=21), with 27 determinants of change in activity identified in quantitative studies across individual, interpersonal and organisational domains. Only two determinants (sex, enhanced school curriculum) were assessed in four or more quantitative studies, the latter showing a consistent positive association with change in activity. 51 barriers and facilitators to preschoolers' activity were identified across all 5 socio-ecological domains. Parents, childcare providers and children themselves most frequently (in 4 or more qualitative studies) mentioned the role of parents, care-providers or childcare; children's perceived safety; and the weather as important positive and negative influences on children's activity. A synthesis of quantitative and qualitative evidence will be presented, focusing on the interpersonal domain, to disentangle the relative influence of parents, care-providers and the environment on change in children's physical activity.

Conclusions: Few determinants were consistently associated with change in preschoolers' physical activity. Across all study types, frequently explored determinants, barriers and facilitators to activity were in the interpersonal and organisational domains (i.e. the role of other people/ the child's immediate environment on their activity). This review highlights the importance of both parental and childcare-related factors as determinants of change for young children's activity.

P2.85

Social support from coaches and players' enjoyment in youth football (soccer).

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: To examine to what extent social support from youth football coaches (as reported by coaches and their players) is related to sport enjoyment among their players, and to what extent social support and enjoyment varies between football teams. Coaches in youth football have the potential to be important sources of social support interactions with adults for youth in organized training.

Methods: A survey was conducted in 2011 among 11-14-year-old children (n=1091) and coaches (n=69) from 69 football teams participating in organized youth football in Norway. Multilevel modelling was used to model within and between variances. Full information maximum likelihood estimation allowed the inclusion of cases with missing data.

Results: Coaches reported giving social support to a high extent, and players reported a high extent of receiving perceived support from their coach. Social support as reported by the coaches was weakly related to social support from coaches as reported by the players. The players also rated their enjoyment in football as very high, as indicated by a mean score of 4.39 on a scale from 1 to 5. There were significant differences between teams in players' perceived support, less so in players' enjoyment. Player reports of social support from their coach were associated with enjoyment in football even when controlling for positive and negative affectivity.

Conclusions: The observed team differences imply that contextual factors (shared by individuals on a particular team) may constitute important targets for interventions aimed at improving the sport experiences of youth. At the individual level, the significance of coaches for players' enjoyment in organized sports has been confirmed. Since enjoyment of participation in sports has been recognised as a key factor for motivated behaviour and sustained participation in youth sport, the findings suggest that coaches may play an important role in preventing drop-out from youth sports, as well as motivating youths for health-enhancing physical activity.

P2.86

Changes in Intervention Coaches' Self-Reported Behaviors during a Sport Season and their Postseason Perceptions of a European Coach Education Initiative: A Mixed-Methods Approach

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: The goals of this study were twofold: (a) establish the impact of a European coach education initiative (i.e., the Empowering Coaching™ training program; Duda, 2013) on changes in youth football coaches' self-reported behaviors over the course of a sport season, and (b) provide some empirically based insights into coaches' views concerning young athletes' motivation to engage and participate in youth football.

Methods: 193 coaches (174 males; 19 females; M age = 41.99; SD age = 6.32) from youth football teams in Norway completed a questionnaire tapping their views about their use of both empowering (i.e., autonomy-supportive, task-involving, social-supportive) and dis-empowering (i.e., controlling, ego-involving) behaviors in the sport context. In addition to the questionnaire data, we used postseason semi-structured interviews with a total of 12 coaches (M age = 41.67; SD age = 5.68) focusing on their perceived importance of attending to athletes' need for autonomy, relatedness, and competence.

Results: Longitudinal invariance, using increasingly restricted models, was tested in a measurement model in order to ensure that the two latent constructs were factorially invariant over time (Little, 2013). Results revealed that both the empowering and dis-empowering dimensions obtained strong factorial invariance across time. To test the means of coaches' self-reported empowering and dis-empowering behaviors, we used the Wald test of parameter constraints (i.e., model test: command in Mplus; Muthén & Muthén, 1998-2012). Results revealed that the means of both empowering and dis-empowering coaching behaviors did not change during the sport season (empowering value = .009; df = 1; p = .93; dis-empowering value = .53; df = 1; p = .47). In general, the interviews revealed that participation in the Empowering Coaching™ training program led coaches to focus more on athletes' need for autonomy, learning and development, and providing athletes with individual feedback.

Conclusions: Findings highlight the challenges related to obtaining effects of coach education interventions in youth sports. The qualitative data indicate that much of the content of the training program was already known to the coaches. Moreover, the content of the training program provided coaches with good reasons for continuing their already existing coaching practices.

P2.87

Evaluation of Physical Activity Public Health Programs in México

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SIG: Yes, Policies and environments

Awards: No

Purpose: Public health programs and initiatives are important, population-level strategies for promoting physical activity (PA) and capitalize on existing public spaces such as streets and parks, or existing community centers and PA resources. These programs can initiate positive changes at the individual, social, environmental, and policy level, bringing together a diverse mix of key stakeholders. Few studies have systematically investigated key areas that would facilitate dissemination such as information on the expertise of those delivering the program, the program components, implementation activities and costs, the long-term sustainability of the programs and health and behavior outcomes for participants. The purpose of this study was to determine publicly reported individual and organizational program factors and investigate whether reporting differed by the program's funding source.

Method: Public health programs (2008-2013) promoting PA were systematically identified by having an active program website. Initial searches produced 23 possible programs with 12 meeting inclusion criteria. A coding sheet was captured behavioral, outcome and RE-AIM indicators from program websites.

Results: All programs targeted PA, five (42%) programs also targeted dietary habits, and the most commonly reported behavioral outcome was change in body composition (58%). Five (42%) programs targeted dietary habits, and three (25%) specifically targeted increasing fruit and vegetable consumption. Two (17%) targeted reducing sugar sweetened beverage consumption, and one (8%) targeted sedentary time. Programs reported an average of 11.1 (± 3.9) indicator items (out of 27). 45% reported reach indicators, 34% reported efficacy/effectiveness indicators, 60% reported adoption indicators, 40% reported implementation indicators, and 35% reported maintenance indicators. The proportion of indicators reported did not differ significantly for programs that were government ($n=5$, $M=10$, $SD=3.1$) versus programs that were partially or wholly privately or corporately supported ($n=7$, $M=12.0$, $SD=4.4$).

Conclusions: Nearly all the programs described the core program components, including information on for whom the program was intended, where one could do the program, and what the program featured. Reach and adoption of these programs was consistently reported across all programs; stronger evaluation of behavioral and health outcomes is needed to provide evidence of the public health impact of these programs.

P2.88

Parent's attitudes and perceptions about preschoolers' physical activity & outdoor time

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SIG: Yes, Early care and education

Awards: No

Purpose:

To describe parental perceptions of preschoolers' physical activity and outdoor time, compare parent responses to child care providers' perceptions, and explore the relationship between parental perceptions and preschoolers' activity levels.

Methods:

Parents and child care providers from 30 U.S. child care centers completed surveys about their attitudes regarding preschoolers' physical activity and outdoor time. Children wore accelerometers for 24 hours and the activity data was scored as total MVPA, home MVPA, total sedentary time and home sedentary time. Parent and child care providers responses were compared. Regression analyses examined MVPA and sedentary time as outcomes with parental perceptions as predictors, using demographics and center as co-variables.

Results:

388 parents and 150 child care providers completed questionnaires. Responding parents were mostly mothers, 55% white, 39% black, 60% did not graduate from college, and 59% were overweight/obese. Child care providers were similar to parents: mostly women, 59% white, 36% black, 62% did not graduate from college and 50% were overweight/obese. Parents and providers both considered daily physical activity important for preschoolers, but providers rated the importance of daily outdoor time significantly higher than did parents ($p<.001$). More parents than providers believed that their child would get sick by playing outside in the cold ($p<0.05$). When compared to higher SES parents, parents of lower SES felt less comfortable with their child playing outside either at home or at child care. However, parents from all SES were more comfortable with their preschooler playing outside at child care compared to outside while at home ($p<.001$). Total and home MVPA and sedentary time were not statistically associated with any parental perceptions queried in this survey.

Conclusions:

Parental perceptions about physical activity and outdoor time were not associated with preschoolers' activity levels on child care attendance days. In fact, parents were more comfortable with their child playing outdoors at child care than at home. In addition, child care providers prioritize outdoor time more than parents and are less concerned about outdoor time in the cold. These findings highlight the importance of child care based interventions to promote preschoolers' physical activity and outdoor play.

P2.89

Short- and long-term effectiveness of 'Join the walk?', a walking intervention for people with mental disorders: The mediating role of quality of motivation.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Background & Objectives:

Physical activity (PA) has potentially beneficial effects on several domains of mental health. Furthermore, walking has been proposed as a promising strategy for improving the level of PA and mental health. A previous study by Pelssers and colleagues (2013) provided evidence for the short-term effectiveness of a structured walking program ('Every Step Counts') in a population of healthy elderly. This walking intervention program was embedded within a socio-cultural organization for elderly and was guided by the principles of Self-Determination Theory (SDT).

In the present study the following two hypotheses were investigated:

(1) the walking intervention would lead to positive short- and long-term effects on PA-levels and mental health (depression and trait anxiety) in a population of adults with mental health disorders; (2) the quality of motivation would mediate these effects, especially in the long term.

Methods:

The walking intervention, which was now called 'Join the walk?', was embedded within sport clubs of the Flemish Federation for Sport and Recreation in Mental Health Care (Psylos). Members of these sport clubs are adults with mental health problems such as depression or anxiety disorder.

Eleven clubs were included in the intervention condition and eight in the control condition. At baseline, the number of participants per club varied from four to sixteen, with 91 participants in the intervention condition and 49 in the control condition. The intervention consisted of four key components: (1) an individualized, pedometer-based 10-week walking program, (2) a weekly group walk, (3) support by a walking coach and (4) health-related workshops. These components were aimed to satisfy the basic needs proposed by SDT (autonomy, competence and relatedness).

Participants in both conditions were measured at baseline (pre-test), after ten weeks (post-test) and after six months (follow-up). The PA-level, mental health (depression and trait anxiety) and quality of motivation were measured with a questionnaire.

Results & discussion:

The results are expected by April 2015.

P2.90

The effects of a 12-month pedometer-determined physical activity intervention on adults in Qatar.

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Pedometer is an effective motivational tool to promote walking. However, studies tend to be of a relatively short duration and longer period is required to demonstrate the long term impact. This study assessed the impact of a 12-months pedometer-based intervention on physical activity

Methodology: The intervention consists of goal setting to reach 10,000 steps or more and to keep it as daily target. The pedometers have been issued for every participant after registration in the website and they create a self-monitoring online account. Participants have been informed about the target and to upload their data every week through an automated reminder text message. Average daily steps measured by pedometer in the 1st week will be taken as baseline measure and the average monthly steps have been compared with the baseline.

Results: The study included 248 adults regular walker adults, and showed a significant increase in average daily steps from 6,061.4 ± 4759.8 steps/day at baseline into 14,411.9 ± 6,435.1 steps/week at the 12th month (P<0.001). In term of percentage of physical active individuals, 20.9% met the daily target of 10,000 steps or more at the baseline with considerable increase to 86.7 % by the 12th week. However this increase was associated with significant decline during hottest months, July and August (42.3%) and a significant increase in the 10th month and onward due re-enforcement campaign. The age group ≥ 40 years became more active than the younger age group. Although females showed increase in their physical activity, they remained less active than males.

Conclusions: Pedometer program was found to be effective in increasing the level of physical activity. Decline in physical activity has been observed during hot weather, while re-enforcement campaign has positive impact on the step-count.

P2.91

Perceived barriers and facilitators for physical activity in prostate cancer survivors on androgen deprivation therapy

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Early Career Award

Purpose:

Improvements in early detection and increased treatment options are helping increase the survival rates for prostate cancer. Androgen deprivation therapy (ADT) is a hormonal treatment that has been used to help slow down prostate cancer progression. However, there are many adverse side effects related to this treatment that can reduce quality of life. Physical activity (especially resistance-based exercise) has been found to help reduce some of the negative side effects related to ADT treatment. The aim of this study was to identify perceived barriers and facilitators for physical activity engagement in prostate cancer survivors who were receiving ADT treatment.

Methods:

A focus group was conducted with six prostate cancer survivors on ADT treatment from the Auckland region of New Zealand. Participants were aged 60 years and older (65.8±11.3 years) and had been on ADT treatment for a minimum of 2 years (2.6±1.0) years. Data were analyzed using an inductive thematic approach.

Results:

Five main themes were identified regarding perceived barriers for physical activity post diagnosis: (1) Lack of specific advice from a clinician regarding post diagnosis physical activity engagement, (2) pre-existing co-morbidities, (3) increased age, (4) fatigue (5) and reduced motivation. Three main themes were identified relating to perceived facilitators for physical activity post diagnosis: (1) Physical activity advice from a clinician regarding need for general weight loss, (2) spousal involvement in physical activity, and (3) taking ownership (i.e., resourcing information regarding how to deal with some of the side effects of hormonal treatment, such as what type of physical activity to engage in).

Conclusions:

This study highlighted the important role that clinicians can have in regard to providing physical activity advice for prostate cancer survivors receiving hormonal treatment. More information is required regarding the perceived barriers and facilitators that men receiving ADT treatment can have for physical activity. Such information can be used to help develop strategies that can be used to help these men initiate and maintain regular physical activity engagement.

P2.92

Barriers to Physical Activity Among Insufficiently and Sufficiently Active Gay Men

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Many gay men are not physically active at recommended levels to achieve health benefits. Thus, a need exists to identify salient general (i.e., common across populations) and population-specific barriers that hinder or stop gay men from participating in physical activity (PA). According to social cognitive theory, individuals may experience a range of barriers to engaging in PA that could include both personal (e.g., lack of motivation) and situational (e.g., inclement weather) barriers. Additionally, salient barriers may be identified through the extent each barrier limits PA (i.e., barrier limitation) and the level of one's confidence to overcome barriers and engage in PA (i.e., self-regulatory efficacy).

Objective: The purposes of this study were to: (1) provide a description of general and population-specific barriers to PA among sufficiently and insufficiently active gay men, (2) identify barrier limitation and self-regulatory efficacy for the reported barriers, and (3) examine the associations between meeting the current PA recommendation, barrier limitation, and self-regulatory efficacy.

Methods: Participants were 108 self-identified gay men aged 21-64 years who completed a 20-minute web-based survey assessing: (1) PA, (2) barriers to PA, (3) barrier limitation, (4) self-regulatory efficacy, and (5) demographic information. Data analyses included a constant comparative method to identify and code barriers into one of 15 main categories (e.g., work-related; outdoor physical environment). Additionally, a binary logistic regression was conducted to examine the associations between meeting the current PA recommendation, barrier limitation, and self-regulatory efficacy.

Results: A total of 35 general barriers and no population-specific barriers were identified by the sufficiently and insufficiently active groups. The sufficiently active group reported higher self-regulatory efficacy and lower barrier limitation for nearly all reported barriers. The binary logistic regression used to examine the associations between PA, barrier limitation, and self-regulatory efficacy was statistically significant, $\chi^2(2, N=108)=19.26, p < .0001, R^2=0.16$. Only barrier limitation significantly contributed to the model.

Conclusions: Future research should continue to examine barriers to PA among gay men to determine whether an intervention needs to be designed specifically for gay men or whether a one-size-fits-all intervention would be effective in helping all men overcome common barriers to engaging in PA.

P2.93

Daily physical activity related to composite risk factor score for CVD in children

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Introduction: The relationships between different physical activity intensities and composite risk factor score for CVD in younger children have not been fully investigated.

Objective: We assessed if objectively measured physical activity is related to composite risk factor score for CVD in children aged 8 to 11 years.

Methods: Cross-sectional study of 156 children (81 boys and 75 girls), recruited from a population-based cohort. Accelerometer measured minutes of moderate and vigorous physical activity (MVPA) and vigorous physical activity (VPA) per day were assessed. Mean counts per minute was considered to reflect general physical activity level (GPA). Total body fat mass (TBF) and abdominal fat mass (AFM) were measured by DXA. Body fat was expressed as TBFs percentage of body mass (BF%), and body fat distribution as AFM/TBF. Maximal oxygen uptake (VO_{2PEAK}) was measured during a maximal exercise test. Blood was sampled and blood pressure (BP) and resting heart rate (HR) were measured. Z-scores (Value for the individual-mean value for group)/SD for each variable were calculated, by sex. Sum of z-scores for lipoprotein concentrations, BF%, AFM, AFM/TBF, systolic and diastolic BP, HR, and inverse VO_{2PEAK} was calculated and used as composite risk factor score for CVD.

Results: Pearson correlation indicated a significant association between GPA, MVPA and VPA versus composite risk factor score in girls (-0.31, -0.39 and -0.42, all $P < 0.05$), but only for VPA in boys (-0.26, $P < 0.05$, the other two not significant).

Conclusion: In this population-based cohort of children GPA and minutes of MVPA and VPA per day were related to composite risk factor score for CVD in girls, in boys only VPA.

P2.94

Enjoyment during exercise mediates the effects of an intervention on exercise adherence

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Regular participation in physical activity is associated with a variety of health benefits and a reduction in diverse chronic diseases. However, empirical studies have shown that about 50% of the participants in exercise programs drop out during the first six months. One strategy to increase regular physical activity would be to promote positive feelings during exercise. The purposes of this experimental study were a) to investigate whether the affective states can be influenced by specific interventions and b) to link these changes in affective states to exercise adherence. The trainers of the experimental group were instructed to promote positive emotions (e.g. pleasure and fun) during exercise according to specific principles. The trainers of the control group were instructed to comply with the recommendations of the American College of Sports Medicine. 24 participants in the experimental group and 17 participants in the control group were recruited for this study. The results of the repeated measures analyses of variance provide a significant time by group interaction suggesting that participants of the intervention group increased their affective ratings significantly compared to the control group. The results of the hierarchical regression analyses support the hypothesis that the changes in affective ratings related to exercise mediated the effects of intervention on physical activity adherence. This study provides evidence that affective states during exercise can be systematically influenced to increase physical activity adherence. Principles on how to increase positive affective judgments related to exercising can be drawn from this study and eventually be used in order to promote regular physical activity among a large part of the population.

P2.95

Prevalence and correlates of strength exercise among breast, prostate, and colorectal cancer survivors in Nova Scotia, Canada

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Student Competition

Objective: Recent research shows that strength exercise improves many health outcomes in cancer survivors including muscular strength and endurance, lean body mass, fatigue and quality of life but few studies have examined the prevalence and correlates of strength exercise among cancer survivors. Studies among colorectal and breast cancer survivors have found that only about 25% reported meeting the strength exercise guidelines. The primary purpose of this study was to examine the prevalence and correlates, and to test the Theory of Planned Behavior (TPB) as a model to explain strength exercise among breast, prostate, and colorectal cancer survivors in Nova Scotia, Canada.

Methods: A stratified sample of 2063 breast, prostate and colorectal cancer survivors diagnosed between 2003-2011 were identified and mailed a cross-sectional, descriptive survey. Descriptive, chi-square and logistic regression analyses were used to determine any correlations among the main research variables of strength exercise behavior, medical, demographic and motivational correlates using the TPB.

Results: Of 741 breast, prostate and colorectal cancer survivors whom responded, 23% were meeting the strength exercise guidelines of ≥ 2 days/week. Cancer survivors were more likely to meet guidelines if they were younger ($p=.001$), more educated ($p<.001$), had a higher income ($p<.001$), better perceived general health ($p<.001$), <2 co-morbidities ($p=.010$), and a healthy body weight ($p=.001$). Moreover, those meeting guidelines had significantly more favorable affective attitude ($p<.001$), instrumental attitude ($p<.001$), injunctive norm ($p=.003$), perceived behavioral control ($p<.001$), planning ($p<.001$), and intention ($p<.001$). The correlates of strength exercise did not differ by cancer site.

Conclusions: The prevalence of strength exercise is low among breast, prostate, and colorectal cancer survivors in Nova Scotia and the correlates are consistent across these survivor groups. Stronger intentions, higher education, younger age, and healthy body weight were independent correlates of meeting the strength exercise in guidelines with very little evidence of variation by cancer site. Interventions to increase strength exercise in breast, prostate, and colorectal cancer survivors should focus on maximizing motivation for strength exercise with special attention to less educated, older, and overweight/obese survivors, but with minimal concern for cancer site.

P2.96

Differences in Leisure Time Activities among Adolescents Girls according to Socio-Economic Position and BMI

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: the main goals of this cross-sectional survey were: (1) to examine differences in girl's leisure-time activities according their SES (defined according to mother's education) and, (2) to analyse the different LT activities according their weight status within their SES status.

Methods: The sample comprised 599 girls, which were classified according to mother's educational level into low, middle and high socio-economic status (SES). A questionnaire assessed Leisure-time activities was applied.

Results: HSES girls were significantly more engaged in individual artistic activities as well in sports activities during leisure-time than their LSES counterparts. No differences according to SES groups were found for social activities; dutiful activities and computer and TV viewing. While no statistically significant differences were found for obesity status (BMI) according to SES, we found statistically significant differences within LSES for social activities.

Conclusions: The results of this study showed that girls belonging to different SES might behave in different ways during their leisure-time. Thus, research of increasing the amount of LSES girls' leisure time spent in PA/sports need to be evaluated.

P2.97

Literature review findings of physical activity interventions for adult patients with type 2 diabetes

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SIG: Yes, Policies and environments

Awards: No

Objective: Consistently, studies have shown that physical activity (PA) produces clinically significant improvements in glucose control in people with Type 2 diabetes (T2D), nonetheless PA lags behind in the management of the target group specifically in primary health care (PHC). This narrative review describes PA interventions carried out for patients with T2D. Intervention methods used were compared and implementation gaps were identified.

Methods: A literature review of randomized control trial articles published from 2001 to date was conducted. Searches were conducted using Medline, Scopus, Cochrane and Web of knowledge. In addition, relevant reports were searched for PA interventions in the management of T2D including WHO reports, International Diabetes Federation (IDF), and American Diabetes Association (ADA). Keywords used were: physical activity, exercise, T2D, interventions, and behaviour change. Interventions for type 1 diabetes, of children or adolescents, not addressing PA behaviour change, and interventions for diabetes prevention were excluded.

Results: PA intervention methods for T2D were found to overlap across many studies with limited reporting on long-term PA behavior outcomes. Thus, interventions were categorized to three methods across 18 selected articles which fulfilled the inclusion criteria: consultations including PA behavior change techniques, use of technology, and structured exercise trainings. All methods were shown to be effective for promoting PA levels of people with T2D. However, several gaps were identified to fully support their individual implementation within PHC. PA consultations by any member of diabetes care team require specific training on behaviour change techniques and is time consuming which may not be feasible for the whole diabetes population. Technology based interventions lacked information on fidelity to implementation protocol and rate of drop outs was an issue especially with telephone based interventions. Structured PA trainings were of short duration and lacked long-term follow up data.

Conclusions: Despite the strong evidence on effectiveness of PA in the management of T2D, there is limited and inconclusive recommendations for the best way to implement PA for patients with T2D in PHC. However a multicomponent PA intervention appears to be promising combining PA consultations, use of technology and structured PA trainings.

P2.100

Gender differences in physical activity motivators and context preferences: a population based study in people aged 60+ years

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: The proportion of people doing sufficient physical activity (PA) for health benefits decreases with age. This decrease is more pronounced in women than in men. Knowledge about motivating factors and context preferences for PA, and about gender differences in these factors, is needed to inform the promotion, design, and implementation of physical activity programs. The aim of this study was to examine gender differences in these factors in older Australians.

Methods: Data were used from 1,937 people aged 60+ years who responded to a mail survey in Brisbane, Australia. Respondents reported their agreement with seven PA motivators and 14 context preferences. Data were analysed using multi-level multinomial logistic regression, adjusted for sociodemographic and health variables, and physical activity level.

Results: Mean age of the respondents was 63.2 (SD 2.21) years and 59% was female. One in three respondents (35%) did not meet the PA guidelines of >150 mins/week. More than 75% of both women and men endorsed motivators to prevent health problems, to feel good, to lose weight and to help manage stress. Women were more likely than men to endorse motivators of improved appearance (OR 2.93, 95%CI 2.07-4.15), spending time with others (1.76, 1.31-2.37), meeting friends (1.76, 1.31-2.36) or losing weight (1.74, 1.12-2.71). More than 75% of both women and men preferred activities close to home and at low cost. Women were more likely than men to prefer activities that are with people of the same sex (OR 4.67, 95%CI 3.14-6.94), supervised (OR 2.79, 1.94-4.02), with people the same age (OR 2.00, 1.43-2.78) and at a fixed time (OR 1.42, 1.06-1.91). They were less likely than men to prefer activities that are competitive (OR 0.32, 95%CI 0.22-0.46), vigorous (OR 0.33, 0.24-0.47), skilled (OR 0.40, 0.29-0.55) and outdoors (OR 0.51, 0.30-0.86).

Conclusions: Although there was overlap in motivating factors and context preferences for PA in women and men aged 60+ years, there were also marked gender differences. These results suggest that PA programs for older people could be tailored to meet gender specific interests in order to promote regular PA participation in this population group.

P2.101

Are Irish adolescents overestimating their actual motor skill abilities?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

Fundamental movement skills (FMS) and perceived motor competence (PMC) are seen as important contributors to future participation in sport and physical activity (Barnett et al. 2008, Ulrich, 1987). FMS are considered the basic units of movement which allow for the development of more complex sport specific skills. The purpose of this study was to investigate the FMS proficiency levels and PMC levels of Irish adolescent youth.

Methods:

395 adolescents, aged 12-13 years old, were tested. The Test of Gross Motor Development 2 (Ulrich, 2000) was used to assess 6 locomotor skills and 6 object control skills. Three additional skills including balance were assessed as they were deemed relevant to the Irish sporting culture (Skip, Vertical Jump and Balance). PMC was assessed via questionnaire where children stated on a scale of 1 (not confident) to 10 (very confident) how confident they were at carrying out the above mentioned 15 FMS.

Results:

Overall participants performed below expected levels of FMS proficiency. Males performed significantly better than females in object control skills ($p=0.001$) and in overall FMS proficiency ($p=0.001$). There was a small positive correlation found between total FMS proficiency and total PMC ($r=0.219$). There was no significant correlation found between male total FMS and total PMC, however there was a significant positive correlation between female total FMS and total PMC ($r=.305$). When further analysed, there was a significant gender difference in performance of 10 FMS skills. However, a significant difference in PMC was found in all 15 skills with males scoring themselves higher than females. This is highlighted by the viewing overall difference in means; for FMS proficiency males= 99.92, females=97.57 and for PMC males=124.54, females=112.79.

Conclusions:

Results from this study revealed that participants scored below the expected FMS proficiency threshold levels. This lack of proficiency among participants will consequently prevent them in the development of sport specific skills. If a child is unable to estimate their motor competence, then they consequently over or under estimate their motor abilities leading to either failure or loss of motivation.

P2.102

The reliability and validity of a perceived motor competence scale among adolescents.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

Participation in physical activity and sport is a well known ingredient for leading a healthy lifestyle (Woods et al. 2010). Fundamental movement skill proficiency is said to be a contributor to participation in physical activity later in life (Barnett, van Beurden, Morgan, Brooks, & Beard, 2009; Hardy, Barnett, Espinel, & Okely, 2013). To better promote participation in physical activity, it is crucial to analyse other aspects that account for the developmental and psychological characteristics of adolescents. For this reason, the purpose of this study is to validate a perceived motor competence (PMC) scale among adolescents as one way to better understand the determinants for PA.

Methods:

A PMC scale was developed based on the 12 skills analysed in the Test of Gross Motor Development 2nd Edition (Ulrich, 2000) along with 3 additional skills which were deemed relevant to the Irish sporting context. 70 adolescents aged between 12-14 years old completed the scale on 2 occasions 3 days apart. In this scale, they rated how confident they were at performing specific skills such as running in a straight line, catching a ball with two hands, etc. They rated their confidence on a scale of 1-10, 1 being not confident at all and 10 being very confident. They also completed the Physical Self-Perception Profile (PSPP) to allow for analysis of criterion validity.

Results:

The PMC scale achieved good reliability with an internal consistency coefficient $\alpha=0.85$. Content validity was achieved as 15 experts in the area were asked to review each of the questions and rate their appropriateness and relevance to the participants' confidence at carrying out these various skills. A correlation coefficient was then calculated between the PMC scale and the PSPP. Criterion Validity was achieved with a correlation coefficient $r=0.86$ between the two assessment tools.

Conclusions:

This PMC scale provides a validated skill specific method of assessing PMC among adolescents. This will provide researchers and educators with valuable skill specific information about adolescents' confidence at performing FMS. Future research should further evaluate this tool as a predictor for FMS proficiency level and physical activity participation.

P2.103

The role of exercise identity in contributing to self-determined motivation in adherers to exercise referral schemes

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

Whilst efforts have been made to understand the psychological variables associated with adherence to exercise referral schemes (e.g., Jones *et al.*, 2005; Edmunds, Ntoumanis & Duda, 2007) the in-depth psychological experiences of participants has yet to be investigated. The present study sought to gain a comprehensive insight into the experiences of adherers to exercise referral schemes. In particular, self-determination theory was used as a framework to understand participants' motivational processes.

Methods:

A qualitative methodology was employed in which 9 adults (*aged 41-67 years; 5 females*) who had recently completed an 8-week exercise referral scheme participated in a semi-structured interview concerning their psychological experiences throughout the scheme. Interview transcripts were analysed using thematic analysis, and themes relating to the research question were identified.

Results/findings:

Two major themes were identified: (1) motivation to exercise and (2) exercise identity.

Participants' motivation to exercise comprised three sub-themes: a) identified regulation, b) intrinsic motivation, and c) no cost. Participants were initially motivated as they viewed exercise as being personally significant and resulted in outcomes valued by the individual (identified regulation) as well as the scheme also being of no cost to them. Once participants started exercising regularly on the scheme their motivation became more intrinsic whereby they enjoyed exercising along with the associated benefits.

The exercise identity of participants was activated and attended to throughout the scheme to assist exercise adherence behaviour. Participants' exercise identity consisted of a number of self-regulatory motives including self-esteem, self-knowledge, self-consistency, self-efficacy, and self-regulation. The role of a participants exercise identity in shaping self-determined motivation is particularly salient given its absence in the related literature thus far and the links to previous findings in exercise settings (e.g., Vlachopoulos, Kaperoni & Moustaka, 2011).

Conclusions:

The findings provide further understanding of the psychological underpinnings of participants who adhere to exercise referral schemes. Knowledge and application of the themes identified could aid future exercise referral scheme participants in becoming more self-determined to exercise, and consequently adhering to exercise referral schemes to help offset their pre-existing health conditions.

P2.104

Sports participation and mental health in children: An observational cross sectional study in the Netherlands

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Existing research suggests that physical activity (PA) has a direct positive influence on mental health in adolescents and adults. It is also a common assumption that the same holds true for children. However, although some indications are found for short term effects of PA on problems like depression and anxiety, there is a paucity of good quality evidence.

The aim of this large study (N=2,151) was to explore the associations between sports participation and mental health in children aged 10 to 12 years. Detailed information on characteristics of sports participation and innovative measures of mental health are used.

Methods:

This study was based on a cross-sectional research project with a representative sample of children of the fourth or fifth grade from 73 primary schools.

Sports participation was measured with the modified Dutch Move and Sports Monitor Questionnaire - Youth Aged 8-12 Years. Mental health was determined by means of the Strength and Difficulties Questionnaire (SDQ). In this low-risk sample we used three subscales, assessing (1) internalizing problems, (2) externalizing problems, and (3) prosocial behavior.

The associations between self-reported physical activity and self-reported mental health were assessed using multiple regression analysis, with potential confounders being controlled for.

Results:

Children who participated in sports had a better overall mental health than children who were not engaged in sports. This was also true for the three aspects of mental health.

In the group children who practised sports there are beneficial effects for team sports and frequent sports participation. Boys who played team sports had less internalizing problems than those who practised individual sports. Furthermore, children who did sport exercises at least twice a week showed a better overall mental health and less internalizing problems than children who exercised only once a week.

The mental health of a child was not associated with the fact whether the child practised outdoor sports (as distinct from indoor sports).

Conclusions:

The positive associations between sports participation and mental health suggest the viability of developing sports programs that improve mental health of children. Playing team sports and being frequently active seem to be most beneficial.

P2.105

Increasing sports participation in inactive employees: evaluation of a national web-based sport and physical activity initiative in workplaces in England

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

The workplace offers an ideal setting to promote physical activity however there is limited evidence as to how to use this setting to engage inactive adults in sport. The 2-year Workplace Challenge project aims to increase sport and physical activity participation in employed adults and includes an eight week web-based national activity log challenge. This paper reports findings from the 2014 challenge.

Methods:

The eight week activity log challenge took place in January-February 2014. Employees registered on the project website (www.workplacechallenge.org.uk), provided demographic data and completed the Single Item Measure of Physical Activity, then logged their activities during the eight weeks. Employees were also invited to complete a more detailed survey, which included the short International Physical Activity Questionnaire, at registration and immediately after the eight week challenge. Activities logged were summarised using descriptive statistics and the Wilcoxon signed-rank t-test was used to assess changes in sport and physical activity participation.

Results:

Overall, 11,768 employees from 2,213 workplaces registered on the website, including 2,704 inactive employees. On average, participants logged 29.9 \pm 30.5 activities across the eight weeks though there was a gradual decline in the mean number of activities logged each week (week 1: 4.4 \pm 4.1 activities per week; week 8: 2.7 \pm 4.6 activities per week). The most popular activities logged included walking, running and cycling. Employees who completed both surveys (n=2061, 17.5% response rate) were female (67.9%) with an average age of 40.6 \pm 10.8 years. There was a significant (p<0.05) increase in the proportion of inactive employees taking part in 30 minutes of sport at least once a week (baseline: 33.1%; follow-up: 57.6%). There was also a significant increase in reported total minutes of physical activity across all participants (baseline: 613.2 \pm 780.1 minutes per week (\pm SD); follow-up: 760.9 \pm 878.8 minutes per week (\pm SD)).

Conclusion:

A national web-based sport and physical activity challenge has the potential to reach a large number of employees and increase participation in sport and physical activity. Additional work is needed to recruit more inactive employees to the initiative and to maintain employee engagement with the activity log during the eight week challenge.

P2.106

Understanding physical activity sharing in online fitness communities: a data driven approach

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SIG: Yes, e- & mHealth

Awards: No

Objective:

With the emergence of wearable technology, huge amounts of data on physical activity are being produced and uploaded to online fitness communities, where the data is again enriched by data from social interactions and gamification. The aim of this research was to collect this data (if publicly available) and build a model that can help understand continued use of online fitness communities.

Method:

In January 2013, using the API of Strava, a popular online fitness community, we collected the activity data of 33,030 publicly available Strava profiles. They all joined Strava in August 2012. After deletion of profiles with missing or erroneous data, or non-active profiles, 4,512 presumed active Strava users were retained. The data collected from the profile pages of these 4,512 Strava users included the number of activities posted on Strava, the number of kudos (likes) and comments that were given to these activities, the amount of virtual rewards obtained with the activities and the number of followers of the Strava user. A multi-sample structural equation model containing these factors was build and evaluated. A distinction was made between two samples: premium (paid) and free users.

Results:

The multi-sample model obtained an excellent fit ($\chi^2(10)=44.18$, p<0.001; CFI=0.99, TLI=0.99, RMSEA=0.03). The results indicate that social feedback is positively associated with the number of uploaded activities. The same result was observed for virtual rewards. Additionally, the more virtual rewards, the more social feedback was obtained. Network size also seems to positively influence the amount of social feedback received. The model explains 41% of the variance in the number of activities shared for free users and 50% for premium users.

Conclusions:

The results give us an interesting view on the importance of some of the features present in online fitness communities that might have an impact on continued use of the platform. Social feedback and virtual rewards appear to be appealing features in this regard. While this data driven approach is a strength of the study, it would be interesting to add psychosocial variables in the model e.g. measures of self-monitoring, self-efficacy and motivational aspects of physical activity.

P2.107

Residential area characteristics and functional limitations among Dutch community-dwelling older adults

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: Living longer independently may be facilitated by an attractive and safe residential area, which stimulates physical activity. We studied the association between area characteristics and functional limitations and whether this association is mediated by transport-related physical activity (TPA).

Methods: Longitudinal data of 271 Dutch community-dwelling adults aged 65 years and older collected in the Elderly And their Neighbourhood (ELANE) study in 2011-2012 were used. Associations between aesthetics (range 0-22), functional features (range 0-14), safety (range 0-16), and destinations (range 0-15) within road network buffers surrounding participants' residences, and functional limitations in instrumental activities of daily living (range 0-8; measured twice over a nine months period) were investigated by using longitudinal tobit regression analyses. Furthermore, it was investigated whether TPA mediated associations between area characteristics and functional limitations.

Results: A one unit increase in aesthetics within the 400 meters buffer was associated with 0.86 less functional limitations (95%CI -1.47 to -0.25; $p < 0.05$), but other area characteristics were not related to functional limitations. An increase in area aesthetics was associated with more TPA, and more minutes of TPA were associated with less functional limitations. TPA however, only partly mediated the association between area aesthetics and functional limitations.

Conclusion: Strategies to prevent functional limitations may target area characteristics.

P2.108

A Model of Media Attendance Perspective on Online Fitness Community Use

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SIG: Yes, e- & mHealth

Awards: No

Objective:

People are increasingly logging and sharing their physical activities on dedicated social media platforms or 'Online Fitness Communities' (OFCs). A popular example of these OFCs is Strava, predominantly used by cyclists and runners. The aim of this study was to identify drivers and determinants of Strava use from a Model of Media Attendance (MMA) perspective.

Method:

A quantitative online survey was distributed on the profile pages of 3400 random Strava users. No geographical limitations were imposed. A comment with a link to the online survey was posted under their last uploaded activity. The survey contained a measurable version of the MMA. MMA represents an integration of both Social Cognitive Theory and Uses & Gratification (U&G). It integrates the social cognitive constructs Self-Efficacy, Expected Outcomes (analogous to U&G), Self-Regulation in a causal framework with inclusion of habitual behavior and use experience.

Results:

434 Strava users completed the survey (13%). The model obtained excellent fit ($\chi^2(7)=8.33$, $p < 0.304$; CFI=0.99, TLI=0.99, RMSEA=0.02) and explains 30% of the variance in Strava use. Self-Regulation, Expected Outcomes and Habit have a significant direct effect on Strava use. No such direct effect was found for Self-Efficacy, though effects of Self-Efficacy were mediated through Self-Regulation, Expected Outcomes and Habit. Experience with Strava had a small but significant effect on Self-Efficacy and Strava Use. Habit is also strongly influenced by Expected Outcomes and has a significant effect on Self-Regulation.

Conclusions:

Results indicate MMA as a valuable framework for studying drivers and determinants of OFC use. Expected outcomes, a construct consisting of Novel Outcomes and Social Outcomes, appear most influential for Strava use, which implies that staying up to date on the physical activities of Strava friends and getting support and connecting to other athletes are essential in OFC use. The significant positive influence of habitual behavior on Strava use illustrates that once the user has absorbed or 'domesticated' OFC use into his/her exercise routines this might be a prerequisite for continuous OFC use. This study is limited to Strava users however. Further application of MMA to other OFCs is needed to determine its applicability for varying OFCs user types.

P2.110

Adaptation of the physical activity neighborhood environmental scale in Oman

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: The rise in NCDs reflects the changing lifestyle of people in Oman. Physical inactivity is a modifiable risk factor for obesity and chronic NCDs. Environmental Interventions to improve physical activity can provide long-term impact on large populations. Research on association of the built environment with physical activity is now an international priority. The international physical activity prevalence study (IPS) group developed a short survey called Physical Activity Neighborhoods Environment Scale (PANES) to assess the environmental factors relevant for walking and bicycling in the neighborhoods. The PANES consists of 17 items that reflect current thinking about environmental correlates of physical activity likely to be relevant internationally.

This study adapted the Physical Activity Neighborhood Environment Scale (PANES) to the Omani context. This research will strengthen the evidence base, which may guide public health policies on chronic disease prevention in Oman

Methods: The adaptation process was conducted in 3 phases: The first step in this adaptation process was the review by a number of experienced experts with diverse backgrounds and knowledge about the local environment to gather their feedback and comments about its usability and appropriateness in Oman. The experts included engineers, university professors, urban planners, physical activity instructors, dieticians and nutritionists. The second phase was translation into Arabic language (the official language of Oman). The final phase is the reliability testing on an appropriate sample of women and men from different governorate.

Results: Two of the 17 items on the original PANES were removed, six were significantly modified, and minor changes to the options were done to three items in the final version of adapted PANES.

Conclusions: A neighborhood environment survey with direct relevance to physical activity was systematically adapted from an internationally validated measure for relevance in the Omani context. Some original constructs were found not to be relevant for Oman and some were modified. Items on the adapted PANES seem sensitive to environmental variations and appear promising for assessing environmental perceptions related to physical activity in Oman.

P2.111

What do Canadians and US parents do to encourage or discourage physical activity in their 5 to 12 year old children?

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: Adopting the PROMIS® approach to developing an item bank, a systematic literature review was conducted to collect a pool of parenting practice items related to physical activity. Parent surveys were also conducted to evaluate the list of items and to add new items not found in the literature. Responses to the parent survey about the parenting practices they used to encourage and discourage physical activity were qualitatively reviewed and described in this study.

Methods: Parents of 5-12 year old children were surveyed about their parenting practices related to physical activity. Data came from 135 parents from Canada (45%) and US (55%) who completed an online survey. Respondents were asked to list how they encouraged or discouraged their children from being physically active. The 2200 responses provided by parents were reviewed by two trained researchers and consensus was reached to group similar responses into unique dimensions.

Results: Of the parents surveyed, 60% were female. The most common dimensions of parenting practices that encouraged physical activity were: 1) parental encouragement (27%); 2) structure of the activity environment (25%); and 3) modeling (17%). Common items within these dimensions included co-participating in activities, encouraging their child to play outside, and taking their child to the park or a place to be active. The most common dimensions of parenting practices that discouraged physical activity were: 1) structure of the activity environment (34%); 2) modeling (15%); and 3) child control (12%). Common items within these dimensions included allowing their child to watch TV whenever they wanted, requiring adult supervision when their child played outside, and not allowing their child to play outside after dark. Differences in the ranking of dimensions and items were found by parent gender, child age, and country.

Conclusions: Parenting practices have been found to predict physical activity among children. Determining the types of parenting practices that parents employ to encourage and discourage physical activity will help in the development of health-promoting strategies to increase children's physical activity.

P2.112

Associations between physical activity levels of mothers and their 1-3 year old children: examining maternal self-efficacy as a mediator

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose:

The association between mothers' and their young children's physical activity is poorly understood, yet important for developing effective strategies to promote physical activity in young families. This study aimed to examine the association between mothers' and young children's light-intensity physical activity (LPA) and moderate- to vigorous-intensity physical activity (MVPA) and to determine whether maternal self-efficacy for supporting children's health behaviours acts as a mediator of this relationship.

Methods:

Cross-sectional data were obtained from 107 mothers and their 1-3 year old children between July 2013 and March 2014. Mothers' and children's LPA and MVPA were assessed concurrently via ActiGraph GT3X (mothers) and GT3X+ (children) accelerometers over seven days. Participants were included in analyses if ≥ 3 weekdays and ≥ 1 weekend day were considered valid (≥ 7.4 hours/day for children; ≥ 10 hours/day for mothers). Maternal self-efficacy for promoting physical activity, limiting screen time and developing fundamental movement skills in her child was self-reported; these items were previously shown to have acceptable reliability (ICC=0.60-0.85). Maternal responses were summed to provide an overall self-efficacy score. Linear regression models were used to test associations between mothers' and children's LPA and MVPA, and the product of coefficients method with bias-corrected bootstrap resampling was used to test mediation via maternal self-efficacy. Analyses controlled for accelerometer wear time, clustering by recruitment group, and age the child began walking.

Results/findings:

Mothers' objectively assessed LPA was positively associated with children's LPA (B [95% CI] = 0.21 [0.04, 0.38]). Maternal self-efficacy partially mediated this relationship (indirect effect [95% CI] = 0.02 [0.00, 0.07]). No association was observed between mothers' and children's MVPA, although a positive association was observed between mothers' MVPA and their self-efficacy for supporting their children's health behaviours (B [95% CI] = 0.09 [0.02 - 0.16]).

Conclusions:

Programs to promote physical activity in young families should focus on increasing mothers' self-efficacy as well as mothers' engagement in LPA with their children. Maternal engagement in MVPA may also be important for increasing mothers' self-efficacy for supporting their children's health behaviours. Additional mechanisms should be explored to further explain the positive association between mothers' and their young children's LPA.

P2.113

Walk Score® and Transit Score® and physical activity among overweight and obese adolescents and their parents

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Neighborhood walkability has been identified as a potential intervention target to improve population level physical activity. Few studies have examined the walkability of a neighborhood with both objective and subjective measures of physical activity. The purpose of this study was to examine the relationship of neighborhood walkability and access to transportation with subjective and objective measures of physical activity among a sample of overweight and obese adolescents and one of their parents.

Methods: The sample consisted of 160 overweight and obese adolescents residing in Metro Vancouver, Canada and a corresponding parent. Walk Score® and Transit Score®, publicly available measures of neighborhood walkability and access to transportation, were obtained for each participant's address. Participants completed a 7-day physical activity recall and wore an Actigraph GT3X/GT3X+ accelerometer for 8 days. Negative binomial and linear regression were used to examine the association of Walk Score and Transit Score with several indicators of self-reported (e.g., leisure activities, leisure walking, run/walk/bike activities) and objectively-measured (e.g., moderate activity, moderate-to-vigorous activity, step count) physical activity.

Results: Among adolescents, a higher Walk Score and Transit Score was associated with higher minutes of self-reported leisure activities and minutes of self-reported leisure walking. Compared with adolescents living in neighborhoods with few transit options, adolescents living in neighborhoods with excellent transit options had higher step counts. Parents living in very walkable neighborhoods had higher step counts compared with parents living in car-dependent neighborhoods. No other associations were found between accelerometer-based minutes of activity and levels of Walk or Transit scores among adolescents and parents.

Conclusions: Levels of physical activity of adolescents and their parents were higher in walkable neighborhood, whereas access to public transportation was only associated with adolescents level of physical activity. The findings from this study add to the growing body of evidence that the neighborhood environment is related to levels of physical activity. The results have implications for city planners and community organizations that are interested in improving neighborhood designs to facilitate walking activities.

P2.114

Physical activity at school for improving academic performance: perspectives of children with ADHD, teachers and health care professionals: a qualitative study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Physical activity (PA) can have beneficial effects on the academic performance of children with ADHD. Yet, little research has been conducted to explore the feasibility of implementing more PA in the school setting. This study aims to understand how children with ADHD, teachers and health care professionals think about the effect and feasibility of more PA at school for improving academic performance.

Methods: One-on-one, semi-structured interviews were conducted with 12 primary school children who were diagnosed with ADHD (aged 10-12 years), 7 primary school teachers and 12 health care professionals. Themes and categories were derived from coding participant interviews deductively (i.e., by drawing on a priori questions from the aims of the study (Pope, Ziebland and Mays 'framework approach', (2000)). All subjects provided written informed consent.

Results: The majority of the children, teachers and health care professionals expressed a positive opinion on implementing more PA in the school setting and believed it could lead to improved academic performance (through better concentration and attention) in children with and without ADHD. For teachers, important feasibility issues included organisational practicality, sufficient facilities, financial capacity and time. With regard to their ideas on the type, frequency, duration and timing of more PA, there was a large variety in the answer of the participants. Yet, based on all participant interviews, the following starting points for future research were extracted: i) identify/design activities to be used when switching from one subject to another, ii) plan classical activities and let children play an active role in making them up, iii) offer structured activities during breaks, iv) plan an extra active break between lunch time and the end of the school day, and v) schedule for more physical education during the week.

Conclusions: Implementing more PA in the school setting seems a promising strategy for improving academic performance in primary school children but there is no clear idea on how to do so in practice. Hence, new teaching methods and PA pilots should be developed, and more research into the effect of PA on academic performance should be conducted to assess which activities work and which don't.

P2.116

A cross sectional study exploring the associations between mothers and fathers objectively assessed physical activity and BMI

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective:

Studies have shown that family members have the capacity to influence each other's health-related behaviours. This study examined whether there were associations in the BMI and objectively-assessed physical activity of mothers and fathers of 5 to 6 year old children.

Methods:

This study used a subset of participants from the B-Proac1v project. Participants included in the analysis were 272 pairs of parents (dyads) that wore an Actigraph accelerometer for at least 500 minutes on 3 or more days, allowing for the calculation of average minutes spent in moderate-to-vigorous physical activity (MVPA). Parents completed a questionnaire that measured demographic information and gathered self-report height and weight. Linear and logistic regression models, adjusted for deprivation, number of household cars, mother's age, employment and BMI (in PA models only) were performed to examine the relationships between parents MVPA and BMI.

Results:

On average, males were more active than females (51 vs. 48 minutes) but had marginally higher BMI scores (25.86 vs. 24.81). MVPA minutes ($r=0.26$, $p<0.001$) and BMI scores ($r=0.20$, $p=0.002$) correlated in dyads. Logistic regression analysis highlighted mothers were almost twice (OR 1.87, $p<0.05$) as likely to be overweight or obese when fathers were. After adjustment, linear regression models showed that at the weekend every 9 minutes of paternal MVPA was associated with 3 minutes of maternal MVPA ($r=0.34$ $p<0.001$).

Conclusion:

Parental physical activity and BMI are associated. Since parents tend to share home environments and often perform activities together or as a family unit, then behavioural changes in one parent may have a ripple effect for other family members. When possible, interventions designed to improve parent or child PA or BMI levels should encourage other family members to participate. Alternatively, researchers should strive to evaluate the ripple effects for other family members in order to fully understand the wider impact of the intervention.

P2.117

Childhood socioeconomic position and adult leisure-time physical activity: a systematic review

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: Participation in leisure-time physical activity (LTPA) benefits health and is thought to be more prevalent in higher socioeconomic groups. Evidence indicates that childhood socioeconomic circumstances may have a long-term influence on adult health and behaviour. However, it is unclear if this includes an influence on adult LTPA and the literature has not been systematically reviewed. This review tested the hypothesis that a lower childhood socioeconomic position (SEP) is associated with less frequent participation in LTPA during adulthood. The mediating role of SEP in adulthood and sources of between-study heterogeneity were explored.

Methods: Studies were located through a keywords search in November 2013 of five online databases (MEDLINE, Embase, PsycINFO, SPORTDiscus, CINAHL). Additional studies were located by searching reference lists. Two researchers independently screened results, assessed quality of included studies, and extracted relevant data. Included studies were English-language publications testing the association between at least one indicator of childhood SEP and an LTPA outcome measured during adulthood. A meta-analysis was not attempted as there was considerable variation between studies in the method of reporting results.

Results/findings: 1,145 citations were identified. After removing duplicates, screening abstracts and examining full-texts, 37 papers from 30 (mostly European) study samples underwent data extraction. In most samples childhood SEP and LTPA were self-reported in middle-age. 19 studies found evidence supporting the review's hypothesis and 11 reported no association. Typically, adjusting for adult SEP partly attenuated associations. There was more evidence of an association in women compared with men, and in UK compared with Scandinavian samples. Results did not vary by childhood SEP indicator or the age at assessment of LTPA.

Conclusions: This review found some evidence that lower childhood SEP was associated with lower adult LTPA (particularly among women and in UK cohorts). However, there was considerable heterogeneity in findings. To better understand the importance of childhood SEP for adult LTPA, future studies should prospectively collect indicators of childhood SEP and examine more detailed measures of LTPA. An understanding of how the relationship varies by time and place could provide insights into underlying pathways. Despite inconsistencies, continued intervention to improve childhood socioeconomic circumstances is recommended.

P2.118

Low physical activity as a risk factor for gestational diabetes in obese pregnant White women and Black women participating in the UPBEAT pilot trial

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Gestational diabetes (GDM) is associated with an increased risk of subsequent type 2 diabetes for both the mother and offspring. Physical activity (PA) is associated with lower GDM prevalence. Ethnic differences in GDM prevalence exist, but little is known about the role of PA in these differences. We investigated the relationship between maternal ethnicity, PA and risk of GDM in obese pregnant women in the pilot phase of the UK Better Eating and Activity Trial (UPBEAT).

Methods: Moderate or vigorous PA (MVPA) was measured by accelerometry at 16 weeks' gestation in 88 White and 50 Black obese women. Logistic regression was used to examine the relationship between ethnicity and GDM (IADPSG criteria) and assess the impact of age, BMI, GWG and MVPA on this.

Results: GDM was not associated with allocation to the intervention group in the pilot trial. GDM prevalence was higher in Black (36%) than White women (20%) (OR 2.3 [1.1, 4.6]; p=0.023). The proportion of women meeting the current PA guideline of 30 minutes of MVPA per day was comparable for Black and White women (62% and 67% respectively; p=0.581). There was some evidence of an interaction between ethnicity and accumulating 30 minutes of MVPA per day and GDM (AOR 5.03 [0.98, 27.9]; p=0.064), suggesting Black women who fail to achieve 30 minutes of MVPA per day were at excess risk compared to White women.

Conclusions: GDM was more common in obese Black than White women. Physical activity may be more important in reducing GDM in obese Black women. These findings have implications for developing interventions to increase PA in pregnancy and require further exploration.

P2.120

The lack of risk awareness of disinfection by-products in chlorinated swimming pools among Taiwanese adult swimmers

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

In Taiwan, microbiological control in swimming pools is performed by disinfection with the addition of chlorine which leads to the formation of disinfection by-products (DBPs). Materials of swimmers' origin including hair, saliva, skin, lotion, and urine may affect the formation of DBPs in swimming pool water. The health effects of DBPs have been studied; while swimmer's risk awareness of DBPs in chlorinated swimming pools remains unrevealed. This study aims to assess the risk awareness of DBPs in chlorinated swimming pools among Taiwanese adult swimmers.

Methods:

Data came from a survey conducted in 2014 and a total of 247 adult swimmers completed a questionnaire concerning swimming habits and knowledge on DBPs.

Results:

Study participants included 58.7% male, the mean age was 35.7 (SE=18.9), and they averagely swim 3.1 (SE=2.5) times per week. The total sample scored, on average, 2.3 items correctly out of 7 in the questionnaire of DBPs Knowledge, demonstrating limited knowledge about DBPs in swimming pools. Female swimmers have slightly higher level of DBPs knowledge than male swimmers (2.58 versus 2.15 items). Swimmers with higher level of DBPs knowledge were more likely to shower before entering swimming pools compared to those with lower DBPs knowledge (97.44% versus 87.57%, $p < 0.05$). Findings also reveal that most study participants reported positive attitudes toward swimming, and knowledge of DBPs was not associated with attitudes toward swimming. The majority of study sample believed that health benefits of swimming are more considerable than health hazards of DBPs (81.8%); and would persist in swimming regardless of the awareness of DBPs in swimming pools (87.9%).

Conclusions:

This study indicates the lack of risk awareness of DBPs in chlorinated swimming pools among adult swimmers. The limited risk awareness might result in the neglect of personal health behaviors such as showering before swimming, which could relate to the increase in the formation of DBPs in swimming pools and subsequent health risks. We suggest that health education on DBPs and personal health should be incorporated with interventions promoting swimming.

P2.121

Physical Fitness Of Dutch Adolescents: Does Physical Fitness Decline During Adolescence?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Physical activity (PA) levels of adolescents decline with increasing age. Since PA has effect on physical fitness (PF), this study aimed to investigate the age-related changes in PF of 12-16-year-old Dutch boys and girls and, to compare the PF progress of this 2012-2013 sample with the progress in boys and girls from 1987.

Methods:

Nine secondary schools in the Netherlands participated in this cross-sectional study. The Eurofit test was used to measure PF of 921 boys and 904 girls. Multilevel regression analyses were executed for all items, for boys and girls separately. Difference-scores were calculated for every Eurofit test item by subtracting reference scores from 1987 from Eurofit test scores. Age-related changes in difference-scores were examined with multilevel regression analyses for all Eurofit test items.

Results/findings:

Multilevel regression analyses showed that sum of skinfolds significantly decreased with age, BMI increased and 6 out of 7 Eurofit test items significantly improved with age in boys. In girls' scores only 3 out of 7 tests (sit-and-reach, plate tapping and relative handgrip strength) improved and all other Eurofit test scores deteriorated. Multilevel regression analyses of difference-scores of boys revealed significant effects of age on 3 out of 7 Eurofit test items compared to 1987. Difference-scores of girls showed significant effects of age on sum of skinfolds, and 5 of the 7 Eurofit-test items.

Conclusions:

Boys' PF improved with age and was in accordance with the PF progress with age in boys from 1987. Girls' PF remained relatively stable with increasing age, however, the PF progress with age lagged behind in comparison with the girls from 1987. Result of our study indicate that although PF increases with age in contemporary youth, overall PF has worsened when compared to 1987 reference data. These result indicate that youth nowadays has worse PF.

P2.122

Does Physical activity among young adults differ by context and psychological factors? A mobile-based Ecological Momentary Assessment (mEMA) study

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Purpose: In the present mobile-based Ecological Momentary Assessment (mEMA) study we examined psychological (cognitive and affective) and contextual (social and physical) predictors of walking, biking, and exercising. Key questions: Are differences in PA associated with different psychological and contextual factors? And can we predict future PA behaviors based on cognitive and affective determinants (i.e., intention, perceived behavioral control (PBC), mood), and need for PA?

Methods: During seven consecutive days, 71 participants (64% female) received prompts from the mEMA-app four times a day, containing questions regarding psychological and contextual factors that influenced their PA during the previous 3.5 hours (i.e., mood, PBC, location (home, school, work), facilities (forests, parks, paths) and social context (alone versus multiple others). Multilevel analyses (i.e., time of day nested within individuals) and exploratory time lag analyses were conducted in SPSS accounting for cross-sectional associations of behavior with psychological and contextual factors, and cognitive and affective predictors of behavior respectively.

Results: Time of day, the home setting, happiness and need for PA were associated with walking, biking, and exercising. Multivariate models showed increased chances of walking outside the home setting ($OR_{\text{homersetting}} = 0.1$, CI 95% = .06-.17), when they experienced the need for PA ($OR = 29.6$, CI 95% = 16.54-52.93) and when they were alone ($OR_{\text{withothers}} = 0.5$, CI 95% = .30-.94). Chances on biking were significantly higher when students felt lonely ($OR = 3.6$, CI 95% = 2.12-6.20) and experienced the need for PA ($OR = 32.3$, CI 95% = 17.80-58.58). Exercising was more likely to occur when they did not feel happy ($OR_{\text{happiness}} = 0.2$, 95% CI = .08-.47), when they felt satisfied ($OR = 13.4$, CI 95% = 5.32-33.97), and when they felt the need for PA ($OR = 242.4$, CI 95% = 101.80-577.37). Exploratory time lag analyses indicated that walking_T, biking_T, and exercising_T were predicted by intentions_{T-1} and PBC_{T-1}, walking_T and exercising_T were also predicted by the need for PA_{T-1} ($p \leq .05$).

Conclusions: Although PA behaviors were associated with both psychological as contextual factors, the present mEMA study only indicated temporal relationships between cognitive predictors (i.e., intention and PBC), need for PA, and future PA.

P2.123

Using combined GPS and accelerometer data to measure physical activity during street play events

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Street play interventions can potentially increase physical activity in children. This may be particularly valuable in areas of high urban density where traffic and walkability are barriers to independent mobility and active travel. This pilot study investigated how much physical activity children obtain during managed street play events.

Methods: Thirty six children aged between 1.5 years and 11 years (6.0 ± 2.8 ; 47% female) were measured during three street play events in Bristol, UK. Participants wore a GPS receiver (QStarz BT-1000XT) to confirm that they were outside, and a triaxial accelerometer (ActiGraph GT3X+) to measure physical activity during street play. Data were collected in 1 second epochs and combined by timestamp. Physical activity intensity was classified using appropriate thresholds for children aged ≥ 5 (Evenson et al, J. Sports Sci. 2008) and < 5 (Pate et al, Obesity 2006). Association between moderate to vigorous physical activity (MVPA) and time outside was examined using linear regression, adjusting for age, sex.

Results: Children spent 54.0 ± 21.2 minutes outside during the events. On average 18% of time was spent in MVPA, 30% in light intensity physical activity and 52% being sedentary during the street play sessions. Overall each session contributed 9.6 ± 5.4 minutes of MVPA. Time outside was a significant predictor of MVPA ($B = 0.15$ 95% CI 0.08, 0.22, $p < 0.001$). MVPA did not differ significantly by age or sex.

Conclusions: Street play events observed as part of this pilot study provided opportunities for children to increase their overall physical activity, conferring on average 15% of the recommended daily 60 minutes of MVPA. The amount of time spent outside during these events is directly related to the volume of MVPA accumulated. Using GPS and accelerometers provides a method to accurately quantify the impact of street play events on PA; a method which can also be applied to investigate the effects of time outside and event duration on PA in other outdoor interventions.

This research was supported by a grant from the Department of Health (Ref: 2499651)

P2.124

Validation of the Fitbit One in young adults in daily life for different time intervals

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: New commercially available technologies that measure physical activity (PA) in daily life in an unobtrusive manner offer new possibilities for assessment and PA promotion. For example, the Fitbit One activity monitor has a build-in tri-axial accelerometer and the possibility to synchronize the data output with a smartphone or computer and thus a possibility to provide real-time feedback. However, little is known about the validity of the Fitbit One to assess different intensities of PA in specific time intervals (i.e., minutes, hours, days) in young adults in daily life. Therefore the current study aims to assess the validity of the Fitbit One compared to the ActiGraph GT3x+.

Methods: Healthy young adults (N=34, mean 23.9 years; 23 females) wore an Actigraph GT3x+ and a Fitbit One on the waist for one week. Participants were included if they had valid data for at least four consecutive days including 10 hours wear time. Different methods were used to analyze the validity at different time intervals (i.e., minutes, hours, days): Bland-Altman plots were used for limits of agreement (LA); Mixed models analysis for the adjusted association between Fitbit One and Actigraph; Interclass correlation coefficients (ICC) to assess agreement (2-way with a random-effect).

Results: Bland-Altman plots showed an overestimation for the Fitbit One of 516.62 steps/day (SD=1504.88; LA= -526.39; 2493.15), 34.34 steps/hour (SD= 209.31; LA= -452.97; 384.29), 0.0 steps/minute (SD=16.82, LA= -33.63 ;33.64). Preliminary mixed models analysis reported strong associations; per day (B=0.844, $p=0.000$), per hour (B=0.895, $p=0.000$) and per minute (B=0.720, $p=0.000$). ICC showed a strong agreement: $ICC_{steps/day} = 0.951$, $ICC_{steps/hour} = 0.910$, $ICC_{steps/day} = 0.764$.

Conclusions: Overall, the Fitbit One overestimates the step activity and Bland-Altman plots show relatively large intervals for the LA. However, when taken into account the systematic overestimation, the Fitbit One seems to be a valid activity monitor. Consequently, based on the preliminary analysis, the Fitbit One might be suitable to deliver real time feedback based, even on minute data in future PA interventions.

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P2.125

Active Transportation in Women at Midlife: A secondary analysis of a pilot RCT

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: To test the effect of a lifestyle intervention for women at retirement to increase active transportation.

Methods: We conducted a pilot study for a six-month RCT to test if the Everyday Activity Supports You (EASY) model increased daily activity and utilitarian walking in women at retirement. The intervention included: group-based education and social support; individualized physical activity prescription; and a Fitbit. We also provided intervention participants with a training session on using public transportation, the physical activity benefits associated with taking the bus, and twenty bus tickets. The control group received group-based information, including a general session on public transportation. We enrolled healthy, inactive, community dwelling women aged 55-70 years [mean (SD) was 63.8 (4.4) years] who could climb a flight of stairs and walk 400 meters. Participants provided travel diaries for seven days and completed the long-form International Physical Activity Questionnaire (IPAQ) at three time-points. We used randomization tests to investigate statistically significant effects of the intervention on participants' use of active transportation (trips/week and minutes/week), and nonparametric bootstraps to estimate the 95% confidence intervals.

Results: Twenty-five participants enrolled in the study and were randomized to intervention (n=13) or control (n=12) groups by remote web-based allocation. Twelve of 13 (92%) intervention participants and 8/12 (67%) control participants completed final assessment at six-months. After adjusting for baseline values, at six-months there were no statistically significant group differences in walking trips (travel diary) or weekly minutes spent on active transportation (walking; IPAQ). However, the intervention group had 6.1 [95%CI: 1.9 to 11.4] more walking trips/week compared with the control group resulting in 210.4 [95%CI: -949.6 to 846.8] more minutes/week of utilitarian walking compared with control group participants. At baseline only four participants used the bus for travel (all from intervention group); at six-months there were five intervention participants and three control participants who reported bus trips (travel diaries).

Conclusions: The intervention group increased their amount of active transportation and number of walking trips over six months. If the EASY intervention is effective for these outcomes in the larger trial, it provides a practical, sustainable opportunity to meet physical activity guidelines.

P2.126

Testing the Role of Outcome Expectancies for Physical Activity in Endometrial Cancer Survivors

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Student Competition

Objective: In social cognitive theory, Bandura posits that self-efficacy acts causally on outcome expectations in predicting behaviors, but that outcome expectations do not have a causal impact on self-efficacy. However, recent physical activity research has suggested that outcome expectations may indeed have a causal impact on self-efficacy, indicating that this often overlooked construct may deserve more empirical investigation.

Methods: This study tested the role of outcome expectations both as originally posited by Bandura, and as a causal predictor of self-efficacy, as recently recommended. In order to examine whether outcome expectations serve as a mediator or antecedent of the relationship between self-efficacy and PA, we tested two autoregressive mediation models in a longitudinal sample of 98 endometrial cancer survivors receiving a PA intervention. Data were collected via ecological momentary assessment at baseline, 2, 4, and 6 months. The first model had somatic sensations, social support, and modeling predicting self-efficacy, self-efficacy predicting positive and negative outcome expectations and outcome expectations predicting physical activity. The second model was the same except that positive and negative outcome expectations predicted self-efficacy instead of PA.

Results: The chi-square difference test comparing the two models showed that there was no significant improvement in model fit for the second model over the first and both models did not meet cut off criteria for fit indices (CFI < .65, RMSEA > .100, and SRMR > .130). In the first model positive OE at T3 predicted PA at T4. In the second model negative OE at T2 predict SE at T3.

Conclusions: It is important to empirically evaluate theoretical models in order to better understand under what situations and with what populations they may best apply. This research joins a number of other studies supporting the complex and dynamic relationship that exists between self-efficacy and outcome expectations. In this sample of endometrial cancer survivors, analyses did not indicate that placing outcome expectations as a predictor of self-efficacy provided a better predictive model of physical activity behaviors. Continued research is needed in order to better target possible proximal mediators of physical activity, particularly in this highly at-risk group.

P2.127

Inverted BMI is a better predictor of habitual physical activity and functional fitness compared to BMI in adults aged 50-80 years old.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: Inverted BMI (iBMI) has recently been shown to better predict physical activity (PA) in children and young adults. No study to date has examined its utility in older adults. This study examined the utility of iBMI and BMI in predicting habitual PA and functional performance in adults aged 50-80 years of age.

Methods: Eighty, free living adults, aged 50-80 years, completed the Timed Up and Go test (TUG), 30s chair stand test and 6min walk as measures of functional fitness. Height and body mass were assessed from which BMI (kg/m²) and iBMI (cm²/kg) were determined. PA was determined using sealed pedometry worn for 7days. A series of ANCOVAs using gender as a between subjects factor and age with either iBMI or BMI as covariates were used to examine the utility of either iBMI or BMI in explaining functional fitness and PA whilst accounting for gender and age.

Results: ANCOVA also identified that BMI and iBMI, controlling for age, were both significant predictors of percent 6minute walk test performance (both $P = .0001$), TUG performance ($P = .03$ for iBMI and $.04$ for BMI), 30s Chair Stand performance ($P = .002$ for iBMI and $.006$ for BMI) and PA ($P = .001$ for iBMI and $.002$ for BMI). iBMI, compared to BMI, was also a better predictor of 6min walk test performance (Adj $R^2 = .243$ vs. $.234$), TUG (Adj $R^2 = .256$ vs. $.244$), 30s Chair Stand (Adj $R^2 = .105$ vs. $.08$), and PA (Adj $R^2 = .354$ vs. $.324$).

Conclusions: This exploratory study suggests that iBMI is a better predictor of functional fitness and PA in adults aged 50-80. As iBMI better reflects lean body mass, and as lean mass decreases with age iBMI may be a more promising measure of weight status than BMI in older adults.

P2.128

I am still active! Cardiac rehabilitation graduates' perspectives on exercise maintenance.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective: The lack of exercise maintenance post-cardiac rehabilitation is currently a topic of concern. The purpose of this project was to explore, through individual interviews, the factors that can help adults maintain physical activity after cardiac rehabilitation. The theoretical domains framework (TDF) was used to guide the analysis given its multi-theoretical perspective.

Methods: Fifteen participants who completed cardiac rehabilitation at least one year prior agreed to a face-to-face interview with the researcher. Participants were primarily men aged between 53 and 79 years who completed cardiac rehabilitation, on average, 4 years prior and engaged in a mean of 306 minutes of moderate to vigorous exercise a week. A semi-structured interview guide was used. All interviews were transcribed verbatim and analyzed using a thematic content analysis. Initial themes were coded based on the TDF (i.e., a deductive analysis) but themes beyond the TDF were still captured (i.e., an inductive analysis).

Results: Participants made reference to 9 of the 14 theoretical domains described in the TDF: social influence (e.g., spousal and peer support), behavioral regulation (e.g., action planning and habit formation), belief about capabilities (e.g., self-efficacy), beliefs about consequences (e.g., anticipated regrets), optimism, emotions (e.g., positive affect following exercise), goals (e.g., to improve health), environmental context and resources (e.g., weather), and social/professional role and identity (e.g., group identity). Through the inductive analysis, participants discussed other important aspects regarding exercise maintenance. They mentioned that adding variety to keep exercise interesting was important. Participants had also clearly made the link between their exercise participation and their health improvements. Most participants had changed their overall lifestyle by incorporating exercise and healthy eating on a daily basis (e.g., choosing to walk, instead of driving, to buy the newspaper).

Conclusions: This study was the first to examine the TDF in exercise maintenance and especially in the post-cardiac rehabilitation context. Results of this study could guide the development of future exercise maintenance interventions by linking the theoretical domains to behavior change techniques. In addition, cardiac rehabilitation specialists could focus on enhancing these concepts and promoting a lifestyle change to help their clients maintain exercise post-cardiac rehabilitation.

P2.130

Body weight in a sample of Mexican females is associated with training time before an annual recreational race

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: To evaluate the association between training time before a recreational race and body weight in a sample female Mexicans participants in 2013 and 2014.

Methods: We designed a panel study that included 494 female from Mexico City who participated in a recreational running race (mostly targeted to beginners) in 2013 and 2014. An invitation to respond a structured online questionnaire was made to all participants in both years. This questionnaire inquired about body weight and determinants of participation in the race. Training time was explored asking participants if they performed physical activity at least once per week prior to the race. Response options were: "Never", "Less than 6 months", "6-11 months" and "12 months or more". A multiple linear regression analysis was used to examine differences in body weight change across training time categories adjusting for age, maximum school grade and other potential confounders.

Results: The mean body weight was (63.5 kg \pm 10.4) in 2013 and (62.9 kg \pm 10.4) in 2014 ($p < 0.05$). Those who reported not having physical activity training during the past year increased 2.9 kg (CI95%: 1.2-4.6) of body weight ($p < 0.05$). Those who reported having physical activity training at least once per week during the past 12 months ($n = 358$) reduced 1.7 kg (CI95%: 0.86-2.6) in body weight. This reduction remained significant after adjusting for confounding variables. Intermediate categories were not significantly different between the races, but a trend-test was significant ($p < 0.05$).

Conclusion: These results suggest that training at least once per week during a year prior to a recreational race might contribute to a significant reduction in body weight compared to those who did not performed any training. Our results suggests that promoting physical activity training at least once per week during 12 months prior to the race could be a more effective mean to achieve healthy body weight than promoting participation in a single annual race for beginners.

P2.131

Are new behavior change strategies needed to increase physical activity in older adults? Assessment of the impact of cognition and education level on intervention success.

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: A recent review of physical activity (PA) interventions in older adults suggests that traditional behavior change strategies (BCS), like goal setting, self-monitoring and planning for relapse, may not be effective in increasing PA because of declining cognitive function in this age group. These techniques are the foundation of most PA interventions thus a shift in intervention strategies might be warranted when working with older adults. This study aimed to explore the effect of cognition and education on change in PA in older adults in a 3-month behavior change intervention.

Methods: Older adults (average age=83) were recruited from 11 retirement communities and randomized to a multilevel walking intervention or an attention matched control. Participants in the intervention employed goal setting, self-monitoring and planning strategies through the use of pedometers, daily step logs, individual counseling, and group education sessions. PA was assessed objectively by accelerometry over 6 days and daily PA was defined as minutes spent at ≥ 760 counts per minute. Participants completed cognitive assessments to assess executive functioning at baseline and 3 months that were scored by time to completion. Education was self-reported and categorized as high school or below (low) or college and above (high). Generalized linear mixed regression models accounted for fixed and random effects.

Results: 273 older adults were included in the analysis. Differences in cognition did not affect intervention success. Those with higher education had a greater increase in PA than those with lower education (34% vs 16% increase, respectively, $p=0.03$). This relationship persisted after adjusting for cognition. No difference in PA existed between education groups, while those with lower cognitive functioning had significantly lower PA levels at baseline.

Conclusions: In contrast to the hypothesis offered in the review, cognitive functioning was not associated with change in PA in an intervention employing traditional BCS in older adults. There was, however, a smaller increase in PA in less educated participants suggesting that something beyond declining executive function is important. Follow up with participants who had difficulty with goal setting, monitoring, and planning, and analysis of the acceptability of techniques used, may provide insights into alternative strategies.

P2.132

The Motivation for Active Travel to School Scale (MATSS): Instrument Development and Initial Validity Evidence.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Active travel to and from school increases total levels of physical activity; however, many adolescents travel passively. As motivation could influence whether adolescents actively travel to school, the aim of this study was to develop, and assess the psychometric properties of a brief measure of adolescents' motivation towards active travel to and from school, using a self-determination theory (SDT) framework; the Motivation towards Active Travel to School Scale (MATSS).

Methods: In phase 1, 25 SDT experts rated the content validity of 28 initial items. Aiken's item content-validity coefficient (V) and Cohen's effect sizes (d) were then calculated. In phase 2, an initial sample of 239 adolescents ($M = 13.25$ years, $SD = .67$) completed the MATSS and confirmatory factor analysis (CFA) was used to explore the factorial validity of the MATSS scores. A cross validation sample of 1,286 adolescents ($M = 12.95$ years, $SD = .54$) then completed the MATSS and CFA was again conducted.

Results: Validity coefficients of 24 of the initial 28 items exceeded the threshold ($V = .63$). Those $< .63$ were removed. All 24 retained items showed acceptable effect sizes ($d \geq .80$). After considering expert reviewers' comments, another eight items were removed from further analysis. A preliminary three-factor (16-items) model suggested poor fit to the data in the initial sample ($CFI = .83$, $SRMR = .10$, $RMSEA = .10$). A further seven items were removed based on low factor loadings or high cross loadings. The revised 9-item model provided good fit to the data in both the initial ($CFI = .95$, $SRMR = .07$, $RMSEA = .06$) and cross validation samples ($CFI = .95$, $SRMR = .06$, $RMSEA = .06$). Additionally, multiple-group CFAs showed no gender invariance ($\Delta CFI < .01$).

Conclusions: This is the first study to provide validity evidence of scores derived from a measure of adolescents' motivation towards active travel to school. The MATSS can be used to investigate what factors influence active travel motivation (e.g., social interaction or green space), whether motivation influences active travel behaviours, and whether motivation enhances the effects of active travel on psychological and educational outcomes.

P2.133

Children's physical activity patterns derived from wrist and hip-worn raw accelerometer data

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Use of raw accelerometer data is becoming more common to enable comparability between studies using different devices and to improve transparency and consistency of post-data collection analytical processes. Presently little is known about children's free-living physical activity derived from raw accelerometer data. This study describes children's physical activity using raw accelerometer data derived from wrist and hip mounted devices.

Methods:

GENEActiv (GAwrist) and ActiGraph GT3X (AGhip) triaxial accelerometers were worn on the wrist and hip, respectively for one week by 129 children aged 9-10 years (79 girls). Devices recorded accelerations at 100 Hz. Raw acceleration data were processed using the same methods to produce daily summary outputs. Outcome variables were average gravity-based acceleration units (g), minutes of moderate-to-vigorous physical activity (MVPA) and vigorous physical activity (VPA). ANCOVA and correlation analyses described differences and relationships between outcomes, respectively.

Results:

Outputs from both devices were strongly correlated (acceleration: $r=0.68$, $p<.001$; MVPA: $r=0.83$, $p<.001$; VPA: $r=0.85$, $p<.001$). There were no between-device sex differences in mean acceleration, MVPA, or VPA. GAwrist output was 45-59% higher than AGhip output ($p<.001$). This resulted in 85% of children achieving recommended levels of MVPA based on GAwrist data, compared to 27% based on AGhip data. Differences between GAwrist and AGhip outputs increased linearly with physical activity levels. Between device differences were observed across individual days, and these differences were generally significant on weekdays ($p<.05$ to $<.001$) but not on weekend days. Average daily differences between monitors were 29.2 g for acceleration units, 42.2 minutes for MVPA, and 7.4 minutes for VPA. Children were more active on weekdays compared to weekends.

Conclusions:

GAwrist and AGhip outputs were strongly associated suggesting that each device measured similar dimensions of children's physical activity. Activity levels derived from raw acceleration data were consistently higher when measured by GAwrist compared to AGhip. To an extent these findings are consistent with those from recent accelerometer calibration studies. Technical differences between the devices, comparability between activities producing wrist and hip accelerations, and the devices' effects on children's physical activity behaviours may explain the differences observed. Further research is required to explore equivalency between monitoring devices.

P2.134

Disentangling the association between depressive and anxiety disorders and leisure time physical activity.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Low levels of physical activity and depressive and anxiety disorders are common and major causes of morbidity and mortality across countries. There is evidence that lower physical activity is associated with poorer mental health and vice versa. However, it is unclear to which type of mental disorders physical activity is most strongly associated, and whether the type of physical activity matters in this association. To unravel the association we investigated whether leisure time sport frequency was associated with depressive and anxiety disorders regardless of sociodemographics and health related factors.

Methods: Using cross-sectional data from the Netherlands Study of Depression and Anxiety (NESDA), multinomial logistic regression analyses were used to investigate the frequency of leisure sport activities among individuals free of and diagnosed with anxiety or depressive disorders. A total of 1948 women and 986 men aged 18-65 years were recruited from the community, general practice and specialized mental health care. Presence of depressive or anxiety disorders was determined with the Composite International Diagnostic Interview (CIDI, WHO, version 2.1); leisure sport frequency was self-reported.

Results: Respondents with depressive and anxiety disorders (35.2%) participated in regular leisure sport less frequently compared to healthy controls (57.5%) ($P<0.001$). Having a current depressive disorder or comorbid depressive and anxiety disorder was associated with a decreased likelihood of engaging regularly in leisure sport. After adjusting for demographics and health related factors, the odds of regularly participating in leisure sport remained significantly lower for those diagnosed with current major depressive disorder (OR = 0.57 (0.46-0.71)) and dysthymia (OR = 0.62 (0.45-0.84)), but not for those with anxiety disorders.

Conclusions: Depressive disorders, but not anxiety disorders, are associated with a decreased participation in leisure sport activities. Since specific depressive and anxiety disorders relate differently to different physical activity characteristics, mental health providers and those involved in intervention design should tailor recommendations and programs accordingly to produce heightened health benefits.

P2.135

A self-determination theory based intervention to promote autonomous motivation and PA engagement among patients with Rheumatoid Arthritis

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: Rheumatoid arthritis (RA) is a chronic inflammatory disease that causes joint pain, swelling and stiffness with eventual structural damage leading to physical dysfunction. People with RA tend to experience fatigue, psychological distress, and are at risk for CVD. Regular physical activity (PA) can attenuate such disease-related symptoms and improve function and QOL in RA patients. The aim of the present research was to examine whether a Self-determination Theory-based (SDT) intervention fosters basic need satisfaction, autonomous motivation towards PA engagement and levels of objectively assessed PA engagement in patients with RA following a 3 month exercise programme.

Methods: A RCT compared two 3 month exercise programmes. Patients in the experimental arm also received a psychological intervention aiming to foster basic need satisfaction and autonomous regulations for PA through contacts with a SDT trained PA advisor. All psychological measures were assessed via validated questionnaires. In order to determine habitual levels of PA engagement, a subsample of participants were also asked to wear an accelerometer (GT3X) for 7 days.

Results: Follow up data pertaining to psychological measures were available for 44 participants (intervention, N = 34, control, N = 24). Of these, 67% (N = 39) provided valid accelerometer data (≥ 3 days for ≥ 10 hours including ≥ 1 weekend day). At 3 months (post intervention), perceptions of autonomy support from the PA advisor were significantly related to intervention participants' competence need satisfaction ($\beta = .49, p = <.01$). Participants in the intervention arm also reported significantly higher competence need satisfaction compared to participants in control arm ($F(1, 56) = 7.98, p = <.01$). For participants with valid accelerometer data, competence need satisfaction at 3 months significantly positively predicted change in autonomous motivation from baseline to 3 months across both groups ($\beta = .34, p = <.05$). In addition, change in autonomous motivation significantly positively predicted moderate PA at 3 months ($\beta = .36, p = <.02$).

Conclusion: Findings suggest that a SDT-grounded PA intervention promotes adaptive motivational processes that may encourage increased engagement in moderate PA in RA patients engaged in a tailored exercise programme.

P2.136

A systematic review of literature relating to the use of mobile messaging in the promotion of physical activity in healthy adults.

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SIG: Yes, e- & mHealth

Awards: Yes, for the Student Competition

Purpose: This systematic review examines the published literature relating to intervention studies which promote physical activity in healthy adults through mobile messaging. Studies were reviewed in relation to the intervention design, effectiveness and acceptability.

Methods: In July 2014, a search of electronic databases; AMED, CINAHL, MEDLINE, PsycINFO, Behavioural Sciences, and SportDiscus using the search string: (exercise or physical activity or fitness) and intervention and adult and (mobile phone or cell phone or m-tech or m-health). Results were limited to articles published in English, with no start date parameter due to the embryonic nature of this research. 53 original articles were cited.

Abstract review excluded articles (28) due to: no specific mention of mobile phone, physical activity or if mobile applications used in isolation. Full article review excluded 14 papers where mobile applications were primary intervention, focus was on disease management, review papers, or study protocols. Additional articles (8) were reviewed as a result of related article recommendations when retrieving publications and 5 articles were not available for review. In total 14 articles were reviewed

Results/findings: The current review found that mobile phone messaging had been used both in isolation, and more frequently in conjunction with additional intervention features, as a modality to facilitate goal setting, activity planning, motivational counselling and self monitoring. Furthermore the evidence reviewed suggests that this form of intervention, particularly when combined with support materials grounded in behaviour change theory, has some utility in the promotion of lifestyle physical activity. Although the acceptability of interventions reviewed was not considered by all authors, relatively low attrition rates and high satisfaction scores suggest that over all, these interventions are well received by the elected population.

Conclusions: The current systematic review provides cautious endorsement for the use of this method of intervention delivery while highlighting a number of methodological challenges in the research to date. This finding is in line with previously published reviews in this field of research (3). The findings of this review have been used to inform the design of intervention and methodology of a proposed research study in adults with mild/ moderate learning disabilities while accommodating the specific constraints of the prospective population.

P2.138

A qualitative study exploring children's perceptions of their social and physical environment in relation to their physical activity behaviour

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Research has found time spent outdoors to be positively correlated with physical activity levels in children. Creating a more appealing environment may help to encourage children to spend their free time outdoors. The study explored the meanings behind why children visit specific locations their local environment. The study also looked at how the social and physical environment interlinks to influence how children view their environment.

Method: Previous studies have primarily focused on adult based perspectives, and quantitative methodologies. The study followed a phenomenological framework, and employed a bricolage methodological approach with a combination of photo elicitation, drawings, and focus groups. Participants (n=8) were aged 10-12 years from Glasgow, Scotland, UK. Participants were given a sketchbook and a disposable camera and asked to document aspects of the environment that they felt inhibited or encouraged their time spent outdoors. Focus groups then followed to discuss their pictures in depth. We implemented a concurrent inductive and deductive thematic analysis on the data. Drawings and photographs were analysed based on location and subject matter.

Results: Cleanliness and safety were two key themes apparent throughout the visual data. Litter and graffiti appeared multiple times in drawings, while rubbish and rusted gates appeared in photographs. Accompanying text illustrated a need for equipment that facilitated play. This was supported during focus group dialogue; the children discussed the lack of play equipment available for their age group.

Focus group data revealed that children appear to be influenced strongly by the social environment. Tribalism was an apparent theme, which suggested that children felt safer in a friendship or peer group when visiting outdoor locations. Another theme was social barriers; teenagers taking ownership of playgrounds caused younger children to feel a lack of ownership in outdoor spaces.

Conclusions: Children appear to have a keen understanding of how their environment influences their time spent outdoors. Themes such as safety, cleanliness and lack of age appropriate play equipment offer simple and cost effective ideas for planners, local councils, and authorities to enhance children's outdoor experiences. Increasing time spent outdoors could potentially increase physical activity participation in children of this age.

P2.139

Generational differences in attitudes to physical activity in UK South Asian women

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

We know almost nothing about the attitudes of second-generation UK South Asians to physical activity, even though they are half of the UK South Asian population. This information is vital if resources to increase physical activity are to be used in a cost-effective way, as unlike the first-generation, they may not need culturally-tailored interventions. We conducted a qualitative study to understand generational differences in the attitudes, barriers and motivations for physical activity in first and second-generation South Asian women.

Methods:

We used a modified grounded theory approach to conduct 28 semi-structured interviews with adult women of Indian origin, living Manchester, England. We used purposive sampling and participants were recruited using general strategies, through schools, universities and societies. Interviewees filled in a seven-day physical activity diary before the semi-structured interview. Interviews were audio recorded and transcribed, then thematically analysed using NVivo 10.

Findings:

Women of both generations were affected by the facilities in their local neighbourhood, such as parks and roads. Second-generation Indian women had received positive messages about the importance of physical activity during their British schooling, something which none of the first-generation women talked about. Western media also indirectly promoted physical activity through the promotion of thinness in women, but the Asian media, which the first-generation almost exclusively watched, had little or no messages about physical activity. First-generation Indian women prioritised their family and households over their own physical activity, but this was not the case for second-generation Indian women, who tended to prioritise their physical activity over other responsibilities. Some second-generation Indian women discussed concerns about their looks while being physically active.

Conclusions:

The physical activity of first-generation women was much more influenced by Indian culture as compared to the second-generation women in this study. Second-generation Indian women cited similar barriers to physical activity as reported by UK women in the general population, which relates mostly to conflicts between being feminine and being active. This suggests that shifting social norms around physical activity and femininity in Western culture would also have a positive effect on the physical activity of second-generation Indian women.

P2.140

An “All Island” approach to physical activity and wellbeing amongst Irish children: The Sport for Life All Island Intervention

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective:

Undeniably, the field of childhood physical activity (PA) promotion has received considerable attention in recent years. Yet, this innovative research approach, particularly the school-based, teacher-student volunteer led partnership over 12 lessons is the “first of its kind” in Ireland. This All Island structure involves six major institutions across Ireland from Ulster, Leinster, Munster and Connaught regions. The purpose of the Sport For Life All Island (SFLAI) intervention is to increase daily PA participation in a sample of primary school children from socially and financially disadvantaged areas of Ireland (Breslin et al 2012). This abstract outlines the rationale and methodology of the SFLAI study.

Methods:

As part of this quasi-experimental design, longitudinal data collection from children, aged 8-9 years old (N=766) across the island of Ireland is ongoing since September 2014. All schools selected for inclusion are from officially designated disadvantaged communities. In Ulster, schools have been identified using the “Northern Ireland Multiple Deprivation Measure” 2010 (NIMDM). In the Republic of Ireland, schools have been identified using the “Delivering Equality of Opportunity in Schools” (DEIS) measurement. Data are being collected during 4 time points (week 1, 6, 13 & 25), with each school randomly assigned to either intervention or control group. Longitudinal data on PA assessment (using self-report and accelerometry), anthropometric characteristics, wellbeing, and knowledge of the benefits of PA are being collected. At this stage of the research, 50% of the data has been collected (Ulster and Leinster) with a further 50% due for completion between January and April 2015. The effectiveness of SFLAI will be assessed in comparison to the control group on PA levels, wellbeing, knowledge and body mass index (BMI).

Conclusions:

Previous findings from a post-primary context in Ireland suggests a positive effect for PA promotion amongst adolescent youth (O’ Brien et al., 2013). Yet, childhood’s PA data from primary schools in disadvantaged communities is less prevalent across Ireland (see Breslin et al, 2012). These imminent findings from the SFLAI intervention are the “first of its kind” and will contribute to an understanding of PA patterns among disadvantaged primary school children in Ireland.

P2.141

Activity Monitors are a useful tool in stroke rehabilitation.

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose:

The use of physical activity monitors (AM) in population-based research has increased dramatically in the last decade. AM can be used to objectively capture characteristics of physical activity behaviour, and can assist the patient and therapists to set physical activity related treatment goals. In the daily clinic practice for stroke survivors, for whom physical activity provides protective benefits, the use of AM is not common practice. Stroke rehabilitation is an active process beginning with acute hospitalization, and continuing after the individual returns to the community. During this process that will take place in different settings, the treatment goals of stroke survivors will change over time. The aim of this project was to implement AM in four different clinical settings and examine the usability of the AM and explore the experiences of patients, therapists and nurses who have used such a device.

Methods:

The AM was implemented in a hospital, a rehabilitation centre, a nursing home and a private practice and was used for 12 consecutive weeks. Seven therapists and 2 nurses were instructed in using the AM within their population and 22 stroke survivors (hospital (n=4), rehabilitation centre (n=6), nursing home (n=7) and private practice (n=5) were included. Experiences with the use of the AM were collected using questionnaires for patients and therapists, followed by two in-depth focus group interviews with therapists. The collected data were analysed and themes were constructed.

Results/Findings:

Both therapists and stroke survivors found the AM useful during the rehabilitation process. The AM got them motivated and they gained more insight into their physical activity behaviour. There were differences between the four settings and phases of recovery. During the acute phase the patients’ needs are not primary related to the physical activity behaviour. In contrast, during the chronic phase (rehabilitation centre and community) therapists and patients wish to engage in sufficient and responsible physical activity levels. Other important factors are ambulation level, cognition and self-management control.

Conclusions:

The AM is a useful and important tool to monitor the physical activity level of the patient during the chronic phase, and is indispensable in stroke rehabilitation.

P2.142

"I can walk, I can talk but... I just can't JUMP?" - Movement skill proficiency amongst primary school children in Ireland

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

Evidence now suggests that activity programmes for youth ought to provide intense instruction towards basic movement skills needed to enjoy a variety of physical activities (Belton et al., 2014; O' Brien et al., 2013). Fundamental Movement Skills (FMS) are basic observable patterns of behaviour present from childhood to adulthood. With a noticeable absence in Irish literature relating to childhood movement patterns, the present study assessed the performance of twelve FMS amongst 5 to 11 year old children.

Methods:

Baseline data were collected in October 2014 as part of a larger longitudinal study (Project Spraoi), evaluating the effectiveness of a prescribed physical activity intervention for children. Participants included children (N=218; 7.95 ± 2.00 years) from three primary schools in a specific geographic area of Co. Cork, Ireland. The following 12 FMS were assessed in a physical education hall using reliable instrument protocol; run, gallop, slide, hop, leap, horizontal jump, kick, catch, overhand throw, strike, underhand roll and stationary dribble. Each of the 12 FMS were assessed in conjunction with the behavioural components from the established Test of Gross Motor Development-2 (TGMD-2).

Results:

No participants possessed complete mastery level across the twelve object related and locomotor movement skills. There was a significant difference in the overall mean composite FMS score (object control and locomotor) between gender, with boys scoring higher (p<0.05). There were marked differences in the number of participants who failed to obtain mastery level across the range of the twelve FMS (e.g. Underhand Roll 93%, Run 22%) and their associated behavioural components.

Conclusions

It is alarming that primary school children do not display proficiency across twelve basic movement patterns. This finding indicates that older children, particularly those aged 9 to 11 years of age may have a difficult time in making the successful transition towards more advanced skills within the sport specific stage. Implications from this study potentially indicate that targeting the weakest skill components during physical education and outside of school hours may prove a valuable strategy in increasing the current FMS levels and the subsequent PA levels amongst Irish primary school children.

P2.144

The importance of work in relation to reaching the recommendation of 30 MVPA daily physical activity.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose (objective):

Physical activity is an important factor in relation to health. Most adults in Norway do not fulfill the recommended amount of daily physical activity, and have no knowledge about the significance of physical activity during work time. The primary purpose of the study was to investigate the physical activity level among kindergarten employees, and the importance of physical activity during work time in relation to reaching the recommendation of 30 MVPA daily physical activity.

Methods:

46 kindergarten employees in Levanger were randomly selected. The subjects used actigraph accelerometer one week during the same time in October 2013. The subjects also answered a questionnaire with questions related to the estimation of their own physical activity. Paired sample t-test was used to examine differences between real and estimated MVPA and CPM in work time and leisure time.

Results/findings:

The results showed that the kindergarten employees in general had a high level of physical activity (mean = 45 MVPA, SD = 20.4). 57% (26 minutes) of the MVPA was achieved during work time. Furthermore, the results show that the subjects underestimated the importance of work in relation to reaching the recommendation of 30 MVPA daily physical activity.

Conclusions:

The findings contribute to new knowledge of the importance of reaching the recommended amount of physical activity in relation to having a physical demanding job. The results indicate that physical activity during work time contributed significantly to reaching the recommended amount of 30 MVPA daily physical activity, and that workers in physical demanding professions may be unaware of this importance.

P2.145

Prevalence and correlates of active travel to school among adolescents in Scotland

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective:

Active travel is an important source of physical activity (PA) in young people and is associated with healthy body composition, greater cardiovascular fitness and improved cognitive performance in school. The Scottish Government aims to increase the proportion of journeys made by public or active transport and reduce the use of cars particularly for short journeys. This paper investigates mode of travel to school and associations with socio-demographic and behavioural correlates among adolescents in Scotland.

Methods:

Data from the 2010 Scottish Health Behaviour in School-Aged Children (HBSC) Survey are presented. A total of 6,771 11-, 13- and 15-year-olds in 273 schools across Scotland took part in the study. Students were asked about mode of transport for the main part of their journey to school and were categorised into 'active' (walking or cycling) vs 'passive' (car, bus, train etc) travel. Self-reported socio-demographics, as well as family car ownership and PA, were used as correlates of active travel.

Results:

Almost of half of adolescents (48%) reported that they usually walk to school but only 1% travel by bicycle. Over 30% of children whose journey to school takes less than 5 minutes do not walk or cycle. Active travel to school was lower among older adolescents and those living in rural areas. It was higher among adolescents from low affluence families but this relationship was largely explained by car ownership; only 42% of children in families with two or more cars walk or cycle to school compared with 70% in families with no car. Adolescents who walk or cycle to school were more likely to meet current PA guidelines, but there was no significant association with vigorous exercise.

Conclusions:

These results suggest that active travel to school can make an important contribution to daily MVPA, but does not necessarily stimulate further vigorous intensity activity throughout the day. The relationship with car ownership suggests that policy interventions may be required to encourage reduced car use for school journeys, especially among high affluence families. Future interventions should also focus on reducing the prevalence of short passive journeys.

P2.146

Behavioral incentives for exercise participation: More harm than good?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Abundant evidence demonstrates the many health benefits of physical activity. Despite these widely known benefits, more than half of US adults do not engage in regular physical activity. Moreover, the healthcare costs associated with physical inactivity have been shown to account for nearly one third of the health care charges in the US. Thus, some employers are using behavioral economic theory to incentivize employees for engaging in exercise, with hopes of reducing healthcare costs. Despite this intuitive approach, research has suggested that external incentives, such as monetary incentives, have the potential to undermine intrinsic motivation to engage in physical activity. This study's purpose was to examine the effects of an employer-based incentive program (IP) on membership retention at a university-based fitness center.

Methods: In a nested case-control study design, participants were members ($N = 1122$) of a university-based fitness center who were followed for one year. Participants were divided into two groups: 534 (47.6%) employees at one of two area hospitals that were offered a US\$25 incentive for each month they checked in to the gym 10 times (IP+) and 588 university employees not offered an incentive for attendance (IP-).

Results: IP+ members were significantly more likely to terminate memberships at 1 year (38%) compared to IP- members (31%; $p = .013$). After controlling for relevant covariates, IP+ members had a 24% increased hazard of terminating a membership compared to IP- members ($HR = 1.24$, 95% CI = [1.01, 1.53], $p = .041$). Attending 10 or more times per month was associated with a 98% reduced hazard of terminating a membership ($HR = .02$, 95% CI = [.01, .09], $p < .0001$), although IP+ members only met that threshold on average 25% of the observed months.

Conclusions: These results suggest that being in an incentive program to exercise may increase risk of membership termination at a fitness center. Future research may consider the effects of varying structured incentives (some reimbursement for lower thresholds of attendance) and implementing simultaneous interventions to increase intrinsic motivation to exercise.

P2.147

The relationship between social support and physical activity in adolescent girls: a systematic review of cross-sectional and longitudinal research

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose:

Physical activity interventions aimed at adolescent girls have had limited effect on increasing physical activity. A better understanding of the correlates and determinants of physical activity behaviour specific to adolescent girls could inform more successful intervention design. Previous research has identified an association between social support and physical activity in other populations although the nature of the relationship between social support and physical activity in adolescent girls remains unclear. This systematic review aimed to synthesise evidence on associations between social support and physical activity in adolescent girls, considering the relationship direction and the effect of different types and providers of social support on this relationship.

Methods:

Search terms representing social support, physical activity and adolescent girls were identified and used to form a search strategy that was adapted for different databases. A systematic search of 14 electronic databases was undertaken in April 2013. Reference lists of included studies and experts in the field were consulted. Cross-sectional and longitudinal articles published in English that reported an association between any aspect of social support and physical activity in adolescent girls between the ages of 10-19 years were included. Studies that focused only on clinical, overweight, or performance populations were excluded. The extracted data were analyzed semi-quantitatively by separating results by provider and type of social support. Extracted variables were grouped into positive, negative, or no association. Results for providers and types of support with $\geq 60\%$ of samples in the same direction were classed as consistent associations.

Results:

62 cross-sectional and 10 longitudinal studies were included for analysis. Total social support and encouragement from parents and friends were consistently positively associated with physical activity behaviour. Friend modelling was also consistently positively associated with physical activity behaviour however parent and sibling modelling were not associated.

Conclusions:

This review identified positive associations between total social support and encouragement from parents and friends on adolescent girls' physical activity. Targeting these constructs in physical activity interventions could lead to more successful intervention outcomes. Future research should investigate how these aspects of social support can be successfully implemented into physical activity interventions aimed at adolescent girls.

P2.148

Well!Bingo: Are bingo clubs a potential setting in which to engage high risk, underserved populations in health promotion interventions.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: Bingo clubs are settings that could offer a potentially novel route to engage older women from low socioeconomic status (SES) areas in health promotion interventions. However, the extent to which this high risk population is represented at bingo clubs, their current health behaviours and their perceptions of health promotion interventions in this setting are unknown. The purpose of this study was to 1) describe the demographics and health behaviours of bingo players and 2); assess their perceptions of health promotion interventions in bingo clubs.

Methods: Members of a bingo club in central Scotland were recruited to take part in this mixed methods study through an information stall at the club entrance. The study consisted of three parts; questionnaires, accelerometers and focus groups. Demographic data and self-reported health behaviours (physical activity [PA], sedentary behaviour [SB] and diet) were collected by questionnaire. Objective PA and SB were recorded with Actigraph GT3X+. Perceptions of health promotion interventions in this setting were assessed via focus groups. Categorical data are presented as proportions, with continuous data presented as means. Focus groups were assessed using thematic analysis.

Results/findings: Questionnaires were completed by 151 women. Women were on average 57 years old and from low SES backgrounds. Those >60 years reported consuming five or more fruit and vegetables/day with 51% meeting UK PA guidelines. Twenty nine women wore accelerometers, with women >60 years accumulating nine minutes of moderate to vigorous PA/day and spending over ten hours/day sedentary. Focus group data (n=27) suggest that bingo clubs were not seen as natural settings for health promotion interventions. However, women were enthusiastic and open minded about possible interventions, with PA interventions likely to be the most acceptable and feasible.

Conclusions: These data suggest that bingo clubs attract older women from low SES backgrounds. Although they perceive themselves as having a healthy diet and taking part in sufficient PA, objective PA levels were low with high levels of SB. This data, combined with an support for interventions in this setting, suggest bingo clubs as a potential context in which to deliver PA interventions for older women from low SES backgrounds.

P2.149

Effects of an exercise program on older adults' participation in exercise outside of scheduled sessions: Influence of exercise program mode

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: The purpose of this study was to determine if exercise program mode (Strength/Stretching/Stability [SSS], Dance, Walking) was associated with minutes of weekly exercise outside of scheduled sessions in older adults (60-78 years-old). We hypothesized that weekly minutes of exercise outside of the program would be greater in the SSS and Dance groups over time when compared with the Walking group.

Methods: Participants were 127 older adults (M age = 64.67 ± 4.03 years; 65.4% female) enrolled in one of three exercise programs: SSS ($n = 32$), Dance ($n = 30$), or Walking ($n = 65$). Each program met three-times weekly for 6 months. SSS was designed to improve strength, stretching and stability and was led by a trained, experienced exercise leader. Dance was designed to improve physical fitness through aerobic dance movement (e.g., English Country, Contra Dancing) and was led by an experienced dance instructor. Walking was designed to improve physical fitness through brisk walking and was supervised by a trained exercise specialist. Although participants were not provided a prescription for exercise outside of the program, they were asked to record daily bouts of exercise, including activity duration, on a weekly home log. Linear mixed models were used to examine differences between groups in weekly minutes of exercise outside of scheduled sessions across the 6-month intervention.

Results: Participants reported 82.9 ± 110.8 minutes of weekly exercise outside of the program. Independent of gender, age, and baseline VO_2 max and physical activity, significant effects of group and group*time were observed. The Walking group reported fewer minutes of weekly exercise across the intervention when compared with the SSS and Dance groups (M minutes = 63.0 ± 105.4 , 95.0 ± 128.5 , 115 ± 92.0 , respectively), $p < 0.001$. Differences between groups were largely due to maintenance of weekly exercise in the Dance and SSS groups and small decreases in weekly exercise in the Walking group during the second half of the program.

Conclusions: Further research to identify psychosocial and cognitive moderators and mediators specific to exercise mode is needed to explain relationships between exercise program mode and older adults' exercise adherence.

P2.150

Exploring rural-urban differences in the physical activity environment in a health disparate region.

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: The Dan River Partnership for a Healthy Community (DRPHC) is a community-based participatory research partnership formed to address obesity in a region experiencing significant health disparities. A series of built environment studies were conducted to advance community-developed and locally relevant causal models of obesity in the regional city. These studies found that predominately black block groups had fewer outlets for physical activity (PA) than predominately white block groups and those outlets had increased levels of incivilities. The current study expanded beyond the city limits and included a description of the type, quality, features and amenities of PA outlets in the 3-county region. We also explored if distance to PA amenities was related to minutes of PA or meeting recommendations for PA by residents in rural versus urban residents.

Methods: A cross-sectional telephone survey collected individual sociodemographic, self-reported PA, and environmental perceptions data of 813 residents from the Dan River Region. PA outlets were enumerated and audited according to the protocols of the Physical Activity Resource Assessment (PARA) tool. Descriptive analyses summarized and compared the PA environments between rural and urban areas. Regression models tested the predictability of distance on PA behaviors.

Results: Less than a third of sampled residents (28%) met current PA recommendations with the average weekly minutes of moderate-vigorous PA at 126.7 ± 181.9 minutes. Count of features and the quality of incivilities were found to be significantly higher in rural outlets (features = 3.20 ± 1.9 ; incivilities = 1.46 ± 0.4) than urban ones (features = 2.45 ± 1.3 ; incivilities = 1.19 ± 0.3). The type of PA resources found was significantly different between urban and rural areas ($X^2 = 15.0$, $p < 0.50$), with rural areas having more prevalence of schools and urban areas having more parks (64% of all parks).

Conclusions: Low PA in this region is complicated by dispersed and unequal quality of physical activity resources. As part of a community-based participatory research initiative in the region to reduce obesity, it is important to recognize the environmental barriers to PA. Community partners are currently reviewing the findings to determine next steps and how these results may inform efforts to promote PA to residents of the region.

P2.151

How much walking should be advocated for good health in adolescent girls?

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: Many adolescent girls do not achieve the levels of physical activity (PA) recommended for health. Walking may offer an acceptable form of PA for this group, but it is not yet known how much walking should be advocated for good health in adolescent girls. The aim of this study was therefore to establish health referenced standards for step defined physical activity relating to appropriate health criterion/indicators in a group of adolescent girls.

Method: Two hundred and thirty adolescent girls aged between 12-15 years volunteered to take part in the study. Each participant undertook measurements (BMI, waist circumference, % body fat and blood pressure) to define health status. Activity data was collected by pedometer over seven consecutive days. Independent sample t-tests were used to classify differences in daily step counts and activity time for each health indicator and health profile.

Results: Individuals classified as 'healthy' did not take significantly more steps-day⁻¹ or spent more time in moderate intensity activity than individuals classified as at health risk or with poor health profiles.

Conclusion: With regard to walking activity, 'healthy' adolescent girls do not walk significantly more in terms of steps-day⁻¹ or time spent in activity than girls classified as 'unhealthy'. This could suggest that adolescent girls may not walk enough to stratify health and health related outcomes and as a result, the data could not be used to suggest an appropriate step guideline for this population.

P2.152

An examination of factors associated with uptake to a community based chronic illness rehabilitation programme (CBCIR): Preliminary findings.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Multi-morbidity and chronic conditions pose a threat to population health. Physical activity is a principal intervention in primary and secondary prevention of chronic diseases. Cardiac rehabilitation, one mode of chronic illness rehabilitation, has an estimated uptake of 60% and adherence of 93% in phase III; however uptake to phase IV (CBCIR) is low at 39%. MedEx is a new model of CBCIR encompassing six programmes including cardiac, pulmonary, claudication and cancer rehabilitation, diabetes care and secondary cancer care. This study will present baseline data of a longitudinal observational study of MedEx with the purpose of identifying factors associated with successful transition from induction to uptake of actual exercise classes.

Methods: Participants referred to MedEx via GPs and hospitals attended an induction day. They completed a MedEx questionnaire (Cronbach alpha >0.8 on all instruments) assessing exercise self-efficacy, behavioural intention and social support; self-reported days by 30 minutes of moderate to vigorous physical activity (MVPA) and physical health measures (body mass index, sit to stand assessing lower body strength and aerobic fitness).

Results: Out of the 127 participants (M age=64, SD=12.1, 53% Male) who completed the MedEx induction, 86 (68%) became MedEx Attenders (MA) and 41 (32%) MedEx Non-attenders (MN). Between groups comparison revealed no gender differences, but the MA group were older than the MN group (A=65+11, NA=61+13, p=0.05). MAs also reported higher average days by 30 minutes MVPA (MA=3.5+2, MN=2.5+2, p=0.03), average exercise self-efficacy (MA=7.3+2.5, MN=6.4+3, p=0.05, 1-tailed) and a lower average lower body strength (A=21+6 (in seconds), NA=18+5, p=0.03). No between group differences on family social support, behavioural intention, fitness or BMI were evident.

Conclusion: This research highlights several differences between individuals who attend or drop out of MedEx following induction, indicating that age, confidence in exercise ability and lower body strength might play a role. Future longitudinal research into these variables is needed in order to fully understand factors associated with optimal levels of transition from induction to actual MedEx exercise classes.

P2.153

Modelling the effect of increases in physical activity on disease burden, considering the effect of both increasing life expectancy and reduced age-specific incidence of disease

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Physical activity (PA) can affect disease burden (person-years of disease) in a population: first by reducing the age-specific incidence of some diseases, and second by increasing longevity, thereby increasing time lived at older ages when disease incidence is higher. We investigated the effect of an increase in PA on population disease burden taking both processes into account.

Methods: We simulated the effect of a 20 minute increase in moderate PA per person per day on a weighted population of 8,118 adults. We modelled the reduced risk of disease by a shift along a dose-response curve for each individual, from which we calculated population impact fractions for each disease included in the model: ischaemic heart disease (IHD), stroke, diabetes, dementia, bowel cancer and breast cancer. A proportional life-table model was used to describe the effect on life expectancy and disease burden of a cohort from birth to death, parameterised for the English population. The effect of PA on mortality was modelled both directly, based on estimates of the effect of PA on mortality ('mortality model'), and indirectly via the effect of PA on disease incidence and, for IHD and cancer, survival ('disease model').

Results: Using both models, total life expectancy and healthy life expectancy both increased, while the years lived with disease fell. Using the disease model, the disease burden increased for bowel cancer but decreased for the other diseases. Using the mortality model, the person-years lived with disease increased for bowel cancer (change +5.1%; 95% confidence interval 0% to +9.6%), breast cancer (+0.7%; -6.0% to +4.7%) and dementia (+4.3%; -3.7% to +12.4%), while decreasing for IHD (-5.0%; -15.6% to +1.6%), stroke (-5.4%; -16.1% to +1.5%) and diabetes (-3.8%; -12.0 to +1.3%).

Conclusions: Even if PA directly reduces the risk of a disease the burden from that disease can increase if the effect of PA on disease incidence is small, the effect of PA on disease survival is pronounced, or the rise in incidence with age is steep. While increasing physical activity will improve health, this may not reduce the burden of some diseases experienced by health services.

P2.154

The association between built environment and active transportation among adolescents in Taiwan

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SIG: Yes, Policies and environments

Awards: No

Purpose:

The present study aimed to examine the associations between measures of the built environment and active transportation among adolescents.

Methods:

A cross-sectional study design was used in the present study. Participants were randomly sampled from eight junior high schools with a total of 92 administrative units. Objective measures of the built environment were obtained through GIS analysis and included urban construction measures, such as residential density, land use mix and walkability. Data of adolescents' days of using active transportation per week were obtained through a school survey during September 2013 through June 2014.

Results:

A total 430 adolescents participated in the present study (age 12-16, mean=13.3, SD=0.88). The mean days of using active transportation (such as walking and biking) to and from schools per week were 2.9 (SD=2.4). The mean scores of safety and crime were 2.9 (SD= 0.35, range: 1-4 with the higher the scores, the more safety in traffic) and 1.9 (SD= 0.61, range: 1-4 with the higher the scores, the more crime events in the community), respectively. The measures of neighborhood construction, such as intersection density, residential density, walkability but not land use-mix were all significantly positively associated with active transportation among this group of adolescents and girls. However, the association between intersection density and active transportation was not found in boys.

Conclusions:

Urban construction measures, such as intersection density, residential density, walkability but not land use-mix were found to have stronger association with active transportation than did land use-mix. Gender of adolescents may play an essential role in the associations between built environments and active transportation.

P2.155

Is there a correlation between active transport with MVPA in Portuguese adolescents? Analysis in a subject of school adolescents.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Introduction: Studies have shown that the active transport (e.g., walking and cycling) to and from school is associated with improved physical activity level among adolescents. The aim of this study is to verify if there is an association between adolescents who use active transport to and from school and moderate to vigorous physical activity (MVPA).

Methods: Data were obtained from 238 adolescents (54.9% girls) aged 14 to 18 years-old attending public schools in Porto municipality). The PA was measured with accelerometers (Actigraph GT1M) during 7 consecutive days, considering 8 hours per day. For the analysis of levels of MVPA we used the Evenson (2008) cut-points. The active transport to and from school was accessed by NEWS-Y questionnaire. Pearson linear correlation was calculated.

Results: The adolescents who walked to school showed a positive correlation with moderate PA and MVPA ($r=0.34$; $p=0.00$ and 0.240 ; $p=0.01$). From school to home we also found a positive correlation between walkers adolescents and moderate PA (0.26 ; $p=0.05$). There is a positive correlation ($r=0.19$; $p=0.04$) between using bicycle as a way of active transport to and from school and a MVPA.

Conclusion: We found a positive correlation between active transport to and from school and MVPA levels. Our results suggest that while active transport should be encouraged among all school-aged adolescent, it is especially important to promote the continuing of this behaviour.

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P2.156

Young people's free-living physical activity patterns and their perceptions of the surrounding built environment: An age and socio-economic comparison.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective:

Research has indicated that young people's PA (physical activity) levels often decline during the transition from primary school to secondary school (Nader et al., 2008; Townsend et al., 2012; Boreham and Riddoch, 2001). Whilst psychological and physiological factors have been explored (Niven et al., 2009; Davison et al., 2007), little is known about how the change in the built environment may contribute to a decline in PA during the transition from primary to secondary school. The current study explored differences in the environmental perceptions, PA levels and movement patterns of key stage 2 and key stage 3 youth.

Methods:

101 youth (46 males; 55 females) took part in this cross sectional study; they wore an integrated GPS and heart rate device and completed daily PA logs for 4 consecutive days. Perceptions of the social and built environment were recorded using the 'Active Where? Survey'. The study was conducted in Central England, with 2 primary schools and 2 secondary schools participating, representing youth from both high and low socio-economic backgrounds.

Results:

As hypothesised, Key Stage (KS) 2 youth were significantly ($p=0.029$) more active (32.04 mins) than KS3 youth (19.82 mins). The GPS findings indicated that KS2 youth spent significantly ($p=0.002$) more time outdoors (69.49 mins), compared to KS3 youth (34.60 mins), with KS2 youth's greater utilisation of the garden environment substantially contributing to their higher total PA levels. In addition, KS3 youth cited significantly more barriers within their surrounding built environment (such as bad weather, no adult supervision and a lack of facilities), compared to KS2 youth. Whilst there was no significant difference in the free-living PA levels of youth from high and low socio-economic backgrounds ($p>0.05$), numerous differences in their perceptions and types of PA were evident.

Conclusions:

The findings highlight major contrasts in the way in which youth from different age and socio-economic backgrounds perceive and interact with their surrounding built environment for PA. Future interventions and policies should differentiate between youth from different demographic backgrounds, and aim to enhance PA and health through maximising time spent outdoors.

P2.157

Combining Behavioural Activation and Physical Activity (BAcPac): Acceptability, feasibility and preliminary outcomes in a pragmatic pilot RCT with patients with depression in IAPT Services.

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: Trials on exercise and depression tend to attract only those interested in physical activity (PA) and who are already active. Research is needed on the effectiveness of novel PA interventions that have wider reach and can benefit the least active. The paper reports on the feasibility and acceptability of an intervention and pilot RCT to compare behavioural activation (BAc) for depression with BA plus integrated physical activity counselling (BAcPac). Routine BA seeks to identify routine, necessary and pleasurable activities that have been lost as a result of low mood and to prioritise and set goals to restore these and new activities. BAcPac increasingly encouraged plans involving daily physical activities to replace sedentary behaviours.

Methods: Sixty inactive patients with a clinical diagnosis of depression, who entered two Improving Access to Psychological Therapies (IAPT) services in the UK, were randomized in a pilot RCT. They received either usual BAc or BAcPac with face to face support and self-help take home materials. Baseline and 4 month follow-up measures of self-reported and GENEActiv accelerometer recorded physical activity, PHQ-9 (depression), and SF36 were collected. Information on patient involvement in the treatments were recorded. Semi-structured interviews were conducted with both Psychological Well-being Practitioners (PWPs) and participants to further examine acceptability and feasibility.

Results: Of those randomized, 44 participants provided 4 month follow-up data (except 28 participants provided complete accelerometer data). Difficulties in recruitment through the Service, training and supervising overstretched PWPs, and collecting routine data about patient engagement limited some of our planned piloting aims. Descriptive data on all outcomes will be presented without any hypothesis testing for this pilot trial. The participants reported low levels of physical activity at baseline suggesting that we met our aim to recruit less active participants than has been reported in other trials. The intervention and self-help materials were well received, as reported in interviews. The PWPs reported that the use of pedometers to self-monitor physical activity and highlight awareness of being sedentary, prior to setting goals were popular.

Conclusions: The findings support the need for a larger trial.

P2.158

Quality matters: Examining the relationship between neighborhood socioeconomic disadvantage and park availability and quality in a semi-urban County in the southeastern United States.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Public parks are key components of community infrastructure that can promote physical activity. Some research has examined whether park resources are equitably dispersed across neighborhoods of varying socioeconomic status and racial composition; however, few studies have examined the interaction of these neighborhood characteristics. Additionally, the quality of park environments has received only limited attention, but is considered integral to use and enjoyment of parks. This study examined the relationship between neighborhood socioeconomic disadvantage and park availability and quality in Greenville County, South Carolina and whether neighborhood racial composition moderated these relationships.

Methods: Based on prior research and confirmatory factor analysis, we created an index of neighborhood disadvantage for each block group in the County (n=255) using U.S. Census Bureau data. Detailed audits of all public parks in the County were conducted in Fall 2013 (n=103). Park availability per block group was determined using ArcGIS and the park quality variable combined two multi-item indices that assessed incivilities within and surrounding each park. Negative binomial and poisson regression were used to assess the association between neighborhood disadvantage and the number of parks and quality concerns, respectively.

Results/findings: No significant differences were detected between neighborhood disadvantage and number of parks, after controlling for covariates. High-disadvantaged neighborhoods were nearly two times more likely to have park quality concerns compared to low-disadvantaged neighborhoods (IRR=1.93, 95%CI=1.24, 3.00). Further, racial composition significantly moderated the relationship between neighborhood disadvantage and park quality; among low-disadvantaged neighborhoods, the number of park quality concerns increased as the percentage of racial/ethnic minority residents in a neighborhood increased, whereas the number of park quality concerns remained constant regardless of racial composition within high-disadvantaged neighborhoods.

Conclusions: This study used a comprehensive disadvantage index, detailed observational audits, and spatial analysis to identify disparities in the quality of parks based on neighborhood socioeconomic and racial indicators. Improvements in park quality may be integral to creating equitable physical activity environments to reduce health disparities in disadvantaged communities.

P2.159

Predicting preschool children's sedentary behaviour and physical activity: preliminary results from focus group interviews with parents by using a socioecological approach

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SIG: Yes, Early care and education

Awards: No

Objective: Little is still known about the parental perceptions about their preschool children's physical activity (PA) and sedentary behaviors especially in low socioeconomic neighborhoods. The effective interventions to reduce socioeconomic inequalities in children's lifestyles can be developed when the barriers and facilitators of children's PA are recognized. Based on the socioecological approach, this qualitative study aimed to study parents' opinions on PA and sedentary behaviors of preschool children.

Methods: Five focus group interviews for parents were held in October 2014. In order to participate for interviews, parents needed to have a 3-5-years old child participating in a preschool in low socioeconomic neighborhood. In these semi-structured interviews, parents expressed their perceptions on children's current PA and sedentary behaviors levels, factors that enhance and prevent these behaviors. A deductive thematic analysis was conducted for the interviews with the help of qualitative data analysis software (NVivo10). A data framework to code the data, which was based on the major themes of the questioning route and socioecological model, was used.

Results: Parents mentioned personal (lack of time, preferences, attitudes, laziness, unsupportive parental rules), socio-environmental (siblings, peer groups) and physical-environmental (weather conditions, accessibility, availability) barriers for their children's PA. To motivate children's participation in PA, parents mentioned that they provide transportation to PA hobbies, and buy necessary equipment whereas joint PA was uncommon. Children were most active when being outside in yard or in preschool. Parents perceived preschoolers as sufficiently active and sedentary behaviors are not replacing time in PA, whereas use of screens was seen to replace other sedentary activities such as drawing and quiet play. Tablet use was reported to be more common in preschool children than using computers or watching TV. Rules at home ranged from not allowing the use of electronic equipment to allowing everything. Parents considered learning to use screens already in early childhood being important in modern days.

Conclusions: Several barriers to increase preschoolers' PA were recognized. These focus groups were the first phase to provide valuable information to inform the content of a DAGIS randomized controlled trial.

P2.160

Increasing Canadian Pediatricians' awareness and use of new Canadian Physical Activity and Sedentary Behaviour Guidelines for children and youth

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: To examine changes in the awareness and use of the Canadian Physical Activity and Sedentary Behaviour Guidelines for children and youth (ages 5-17 years) in a sample of Canadian pediatricians, and to assess related barriers and resources.

Methods: The membership of the Canadian Pediatric Society (CPS) was invited to complete an on-line survey of their awareness and use of Canadian Physical Activity and Sedentary Behaviour Guidelines for ages 5-17 years in February 2013. Barriers to recommending the guidelines to patients were also assessed. In response to the findings of this baseline survey the CPS produced, provided and promoted resources to increase awareness overcome barriers. Subsequently, the CPS membership was surveyed again in September-October 2014. Findings are based on responses from 331 and 217 Canadian pediatricians who completed the survey in 2013 and 2014 respectively.

Results: Approximately half of the pediatricians reported being very or somewhat familiar with the physical activity guidelines and familiarity remained unchanged after awareness interventions (56% 2013 vs 54% 2014). Familiarity with sedentary behaviour guidelines was lower but increased after resources were available (37% in 2013 vs 43% in 2014, $p=0.15$). In 2013, 37% of pediatricians that perform well-child visits reported almost always making physical activity, and sedentary behaviour, recommendations respectively to parents/caregivers of children and youth. These numbers increased to 40% and 48% for physical activity and sedentary guidelines respectively in 2014 but neither reached significance ($p=0.42$ and $p=0.11$ respectively). The most common barriers to recommending the guidelines were lack of time and insufficient motivation/support from parents/caregivers/youth in both 2013 and 2014. A lack of knowledge/training was reported as a barrier sometimes/often/always by 32% of respondents in 2013 and only 14% in 2014 ($p<0.001$). Respondents learned about CPS resources predominantly through mail-outs, the CPS website and newsletters. Nine percent of respondents were unaware of related CPS resources. Resources most often used included on-line information for parents, posters and prescription pads. App-based access to guidelines information was a recommended future resource.

Conclusion: CPS resources produced little improvement in awareness and use of guidelines. To further increase the use of guidelines, sustained and additional strategies are needed.

P2.161

Is Active Design changing the workplace?

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SIG: Yes, Policies and environments

Awards: No

Purpose: Active Design is a relatively new concept in design, but there is little evaluation done on its effects on healthy behaviour. The occupation of new, state of the art office buildings designed for promoting healthy behaviour and productivity provides a good opportunity to evaluate how the indoor environment can change sedentary behaviour, and perceptions of productivity and of the workplace.

Methods: 122 adult participants moving from 14 different locations into a new office building at the University of Sydney, Australia were included. After providing consent the participants completed an online questionnaire two months prior to the move and two months post-move. The questions related to health behaviours (physical activity, sitting time and sleep), musculoskeletal issues, perceptions of the office environment (noise, lighting and ventilation), productivity, and engagement.

Results: Preliminary results (including 40 participants) show that the participants tended to sit less of their work time after the move (change from 75% - 66%, $p=0.01$) where the sitting was replaced by standing (17% - 22%, $p=0.04$), while the unrelated behaviour of walking remained unchanged. The participants also reported less musculoskeletal pain, especially in the lower back, (2.5 - 1.9, $p=0.004$). A large proportion of participants in the new workplace were located in an open plan office (67%), more than the 20% before the move. The results suggest that the new work environment is perceived as more stimulating, with better light and ventilation, but noisier and providing less space. No difference was reported in productivity related measures. Post-move data collection is currently underway providing a fuller sample.

Conclusions: The results show some reported physical health promoting effects of moving to a new Active Design building. However, the results around workplace perceptions are variable, possibly due to the open plan office design, resulting in an unchanged perception of productivity measures.

P2.162

The WISH study: Peer-led Walking In ScHools to improve physical activity in adolescent females

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: To explore the effects of a 12 week peer-led brisk walking programme, delivered within the post-primary school setting, on physical activity levels in adolescent females.

Methods: 190 adolescent females aged 12.6 ± 0.5 years (mean BMI 19.8 ± 4.1 , 26% overweight/obese) in 6 schools volunteered to participate in the study. Schools were randomly assigned to participate in a school-based peer-led brisk walking programme or to receive no additional physical activity (control). Intervention content was guided by Social Cognitive Theory and findings from qualitative focus group work conducted within this population. A number of opportunities to complete 15 minute walks were offered on a daily basis, around the school grounds, and facilitated by older students (aged 15-17), trained as walk leaders. The walk leader ensured walking was at a sufficient pace to elicit moderate intensity activity. Physical activity was measured at baseline and 12 weeks using an Actigraph GT3X accelerometer worn for 7 consecutive days. School-time physical activity (weekday 08:30 - 16:00) was determined for all participants with ≥ 3 school days of valid wear.

Results: 121 participants had valid accelerometer data for inclusion in subsequent analysis. Compared to the control group, the intervention group showed a significant increase in total daily physical activity from 124.7 minutes/day to 134.2 minutes/day ($P=0.002$). Sedentary behaviour decreased significantly ($P=0.002$) while light intensity physical activity increased significantly ($p=0.005$) at 12 weeks in the intervention group compared with controls. There were no significant differences for time spent in moderate or vigorous physical activity between groups at 12 weeks.

Findings: The intervention increased total daily physical activity and decreased in sedentary behaviour in adolescent females but did not change moderate-to-vigorous physical activity (MVPA). These findings suggest that whilst a school-based peer-led walking intervention may be feasible and can elicit changes in physical activity and sedentary behaviour, the self-selected walking speeds determined by a peer-leader may not be sufficient to reach MVPA in this age group.

P2.163

Physical activity and the high use of physician services among older Canadians

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Most healthcare spending on physician services can be attributed to a disproportionately small group of high users of health services. Given that older adults are the most likely to be in this group, there is growing interest in the emerging role of physical activity (PA) as a strategy to mitigate the pressures that an aging population will place on the health care system. This study examined relationships between leisure-time PA (LTPA), non-leisure PA (NLPA), and high use of general physician (GP) and specialist physician (SP) services in a nationally representative sample of older Canadians.

Methods: Data from the Canadian Community Health Survey (Cycle 3.1) were analyzed, yielding a sample of 56,682 adults (48%M; 52%F; 63.5±10.2 yrs mean age), stratified into 3 age groups (50-64 yrs; 65 to 79 yrs; ≥80 yrs). Leisure-time PA was classified as follows: inactive (<1.5KKD), moderately active (1.5-3.0KKD) or active (>3.0 KKD). Non-leisure PA was characterized as: mostly sitting; mostly standing and/or walking; or mostly lifting light and/or heavy objects.. Associations between PA and high use of GP and SP services (determined as the mean+1SD) were analyzed using generalized linear modelling procedures, controlling for a comprehensive set of co-variables, including gender, income, and health and injury status.

Results: Depending on age and LTPA group, between 5.1% and 18.9% of respondents were classified as high users of GP (≥9 visits/yr) and/or SP services (≥3 visits/yr). Multivariate analyses revealed that LTPA was not significantly associated with high use of GP or SP services in any age group. With the exception of GP services among 50-64 year olds, NLPA was significantly negatively associated with frequent use of GP and SP services ($OR_{adj} = 0.51 - 0.84$; $p \leq 0.05$).

Conclusion: Non-leisure PA appeared to be a stronger predictor of physician services utilization than LTPA, particularly in the two oldest age groups. Reducing sedentary behaviour by facilitating opportunities for older adults to live independently and be more actively engaged throughout their day, together with opportunities for structured LTPA, may be an effective strategy to help contain health care costs associated with the high use of physician services.

P2.164

Associations between quality of life, physical activity, and sedentary behaviour: An examination of continuous and bout measures of activity and sedentary behaviour from the Walk 2.0 trial

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The health benefits of physical activity participation and minimising sedentary behaviours are well known. As well, evidence exists for the relationship between physical activity and health-related quality of life. Research addressing these questions, however, has predominantly focused on continuous physical activity and sedentary behaviour measures, and has paid less attention to frequency measures (e.g., bouts of participation or sedentary time). The purpose of this study was to compare a continuous duration measure of physical activity and sedentary time with a frequency measure (number of bouts ≥10 min), and to test for associations of each with health-related quality of life.

Methods: Baseline data from the Walk 2.0 Study were used for analysis in this study. The Walk 2.0 Study is a randomised controlled trial investigating the effects of Web 2.0 applications on engagement, retention, and subsequent physical activity behaviour change. Participants (N = 506) were 50.8 ± 13.0 years old and had a BMI of 29.3 ± 6.0. Physical activity and sedentary behaviour were measured using ActiGraph GT3X activity monitors and health-related quality of life was assessed with the RAND 36-item Short Form Health Survey (SF-36). Multiple regression models were used to test relationships of the continuous and bout measures of physical activity and sedentary behaviour with quality of life.

Results: Participants engaged in 23.9 ± 18.1 minutes across 0.6 ± 0.7 physical activity bouts and 535.5 ± 82.3 minutes across 17.0 ± 3.4 sedentary behaviour bouts daily. Of the eight quality of life subscales, six were not significantly associated with either the continuous or bout measure of physical activity or sedentary behaviour. General health was negatively associated with the continuous measure ($\beta = -0.29$) and positively associated with the bouts measure ($\beta = 0.22$) of sedentary behaviour, but the interaction term between the two measures was not significant. Physical functioning was positively associated with the continuous physical activity measure ($\beta = 0.22$) but not with the bouts measure ($\beta = -0.06$).

Conclusions: It is important to consider both duration and frequency (bout) measures of physical activity and sedentary behaviour, as both have differential impacts on health-related quality of life.

P2.165

Correlation of sociodemographic characteristics of adolescents with dietary habits and physical activity in Saudi Arabia

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: The objective of this study was to investigate the cross-sectional relationship between the sociodemographic characteristics and eating habits in adolescent intermediate school girls in Riyadh.

Methods: The 520 female students, aged 13–19 years old, were randomly selected from 30 intermediate schools. All surveys were self-administered. Data was collected through a reliable and valid questionnaire covering dietary habits and sociodemographic characteristics. This was followed by anthropometric measurements and the calculation of body mass index (BMI). Percentage, means, and standard deviation were used to analyze the data statistically and using the SPSS program.

Results: The results indicated that the prevalent rates of overweightness and obesity were 20.38% and 11.35% respectively, while the underweight rate was 31.73%. The results revealed that the majority of the participants consumed three major meals a day—breakfast, lunch, and dinner were eaten by 81.8%, 98.1%, and 94.4% of the participants respectively. The results revealed a significant relationship between high levels of maternal education and a higher likelihood of eating breakfast ($0.97 < p < 0.05$) and lunch ($0.123 < p < 0.01$). Paternal education levels were also associated with a higher likelihood of eating breakfast and lunch, and with physical activity (0.181 , 0.136 , and $0.122 < p < 0.01$ respectively). The research also showed a significant relationship between age and obesity, as older girls were more likely to be obese; these older girls were also less likely to exercise ($-0.107 < p < 0.05$). As well, girls with a higher BMI were more likely to skip dinner ($-0.167 < p < 0.05$).

Conclusions: The parents' education level is a strong influence on their daughter's eating habits. Nutritional programs must be designed, and should begin with the parents in order to improve awareness of nutrition and of the need for their children's physical activity.

P2.166

Objectively measured and self-reported leisure-time sedentary behavior and academic performance in youth; The UP&DOWN Study

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose: To examine the associations of (i) objectively measured and self-reported sedentary behavior during leisure time with academic performance and (ii) patterns of sedentary behavior with academic performance in children and adolescents.

Methods: This study was conducted with a total of 1146 youth (564 girls) aged 12.5 ± 2.5 years. Leisure-time sedentary behavior during out-of-school hours was assessed by both accelerometry and the Youth Sedentary Behavior Questionnaire. Academic performance was assessed through school grades.

Results: Objectively measured sedentary leisure-time was not significantly associated with academic performance (all $p > 0.05$). Time spent in Internet surfing, listening to music, and sitting without doing anything were negatively associated with all academic performance indicators (b ranging from -0.066 to -0.144 ; all $p < 0.05$). However, time spent in doing homework/study without computer and reading for fun were positively associated (b ranging from 0.058 to 0.154 ; all $p < 0.05$). Five major sedentary patterns were identified. The "high social-low TV/video" and the "low studying-high TV/video" patterns were negatively associated with all academic indicators (b ranging from -0.085 to -0.148 ; all $p < 0.05$). The "educational" pattern was positively associated with all academic indicators (b ranging from 0.063 to 0.105 ; all $p < 0.05$).

Conclusions: Specific domains of self-reported sedentary behavior during leisure-time, but not objectively measured sedentary leisure time, may influence academic performance. Avoiding the "high social-low TV/video" and the "low studying-high TV/video" patterns and adopting the "educational" pattern could help youth achieve potential improvements in academic performance.

P2.168

ActiveChat: Development of an 8 week school-based intervention to increase motivation for physical activity and reduce sedentary behaviour in secondary school pupils.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: The Models of University-Schools Engagement (MUSE) is an integrated project to promote collaboration between researchers, university students and school pupils. Within the MUSE umbrella, the aim of the ActiveChat project was to develop an 8 week student-centred learning programme to be delivered to S1-S3 secondary school pupils (11-14 year olds). Due to only 15% of children aged 11-15 meeting the physical activity (PA) guidelines in Scotland (Currie et al, 2011), the focus of ActiveChat was to promote the importance of increasing PA and reducing sedentary behaviour (SB), by actively engaging pupils in research-based learning. The constructs of the Self-Determination Theory (Autonomy, Competence and Relatedness) underpinned the programme, and lesson learning outcomes were aligned with the third phase learning outcomes of the Curriculum for Excellence (CfE).

Methods: CfE documentation was analysed and learning outcomes for the third phase of learning were extracted. Each lesson was designed allowing pupils to experience autonomy, competence and relatedness within the classroom whilst engaging and learning about the importance of PA, reducing SB and research within the area. Lessons were designed to incorporate learning outcomes for five key areas of the CfE (Health and Wellbeing, Literacy, Numeracy, Technologies and Expressive Arts) to provide a comprehensive school-based programme.

Results: The outcome of this project was the development of a framework to allow secondary school pupils to participate in research that meets the requirements of the CfE, with a focus on PA and SB. The 8-week programme consists of 1x 2-hour lessons per week and addresses 29 different learning outcomes across five areas of CfE. This is provided through pupil voice, data collection and processing, and delivering of Power-Point presentations.

Conclusion: CfE learning outcomes can be incorporated into an active, research-based learning programme to promote PA and reduce SB in secondary school children. The ActiveChat programme aims to enable pupils to learn about research processes and the advantages of an active lifestyle, while developing skills and knowledge in several areas of the secondary school curriculum. Further evaluation and testing of the programme in a school setting is required which will be the next phase of the project.

P2.169

Objectively measured physical activity and the risk of childhood obesity in school children

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Globally, public health policies are targeting modifiable lifestyle behaviours. Thus, a deeper understanding of the independent contribution of sedentary behaviour and moderate to vigorous physical activity (MVPA) on the risk of childhood overweight and obesity is needed. This study aims to describe current trends and patterns of objective physical activity and sedentary behaviour. Secondly, we explore the independent association of sedentary time and MVPA on the risk of overweight and obesity in a sample of school aged children.

Methods:

A cross sectional survey of 1,075 children aged 8-11 years. Objective height and weight measurements were used to calculate body mass index and International Obesity Taskforce definitions categorised children as (1) normal weight or (2) overweight and obese. Diet was measured using a 3 day food diary. Children wore wrist-worn Geneactiv accelerometers for 7 days and classification thresholds were applied to categorize minutes of sedentary time and MVPA. Children who achieved MVPA recommendations engaged in ≥ 60 minutes of MVPA per day. Total screen time was reported by parents and categorised as >2 hours/ <2 hours. Poisson regression examined the independent association of (1) total sedentary time, (2) screen time and (3) MVPA on the risk of overweight and obesity.

Results:

One quarter of the children were either overweight or obese. Overall, 22.1% (95% CI, 19.2-24.9%) of children achieved current MVPA recommendations with a higher proportion of normal weight children meeting recommendations than overweight or obese children (26.0% v 9.7%, $p < 0.001$). Over a full week, normal weight children engaged in approximately 20 minutes extra of MVPA per day than overweight and obese children. Time spent at MVPA was inversely associated with the risk of childhood obesity independent of sedentary time. Time spent sedentary was not associated with childhood overweight and obesity independent of MVPA. However, time spent at screen time activities was associated with an increased risk of overweight and obesity.

Conclusions:

School children are not achieving adequate levels of physical activity and are spending a large proportion of the day sedentary. Sustainable public health policies are urgently needed to increase physical activity levels among all children.

P2.170

European Fans in Training: a socio-psychological approach to the development of a healthy lifestyle programme to engage an at-risk group in sustained behaviour change

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Achieving sustained health behaviour change remains elusive, and certain at-risk population groups are more difficult to engage. The European Fans in Training (EuroFIT) programme aims to use the cultural symbols of the traditionally male football club setting, understandings of hegemonic masculinity, psychological theory (self-determination and achievement goal theories), behaviour change techniques and co-design with end-users to engage male football supporters aged 30-65 in four European countries, the UK, the Netherlands, Norway and Portugal, in initiating and maintaining improvements in physical activity, sedentary behaviour and diet.

Methods: We mapped the function (e.g., the processes through which change is enacted) and form (e.g., the content and style of delivery) of existing programmes, and conducted co-design workshops with professional football club coaches and potential end-users.

Results/findings: Mapping the content of previous health behaviour change interventions delivered to men in professional sports club settings revealed nine functions: creating a sense of belonging/feeling valued; creating a relaxed/non-threatening environment; personalisation; facilitating learning; promoting competence; promoting self-regulation/autonomy; promoting relatedness; promoting transferability/sustainability of behaviours; and supporting (re)negotiation of masculine identities in relation to health. These functions were associated with specific components, including: identification with the club 'brand' and 'men (enough) like me'; clear, relevant messages; opportunities for experiential learning; individual, optimally-challenging SMART goals; self-monitoring; enjoyment/interest in new behaviours; interaction within-/post-programme; and coping planning. Interactive workshops with football club coaches from the four participating countries allowed mutual learning around participant recruitment, cultural sensitization and the delivery of specific components, and helped to build a collective identity. Co-design workshops with male football fans in the four countries led to further refinement of the overall delivery protocol, and local country-specific cultural adaptations (e.g., around physical activity and dietary advice).

Conclusions: The EuroFIT programme draws on emerging evidence and sociological and psychological theory on initiating and sustaining behaviour change, together with coach and end-user co-design to maximize potential uptake, adherence and effectiveness. It will be evaluated in a randomised controlled trial in top professional football clubs in the UK (England), the Netherlands, Portugal and Norway in 2015-17.

P2.171

The association between schoolyard characteristics and moderate-to-vigorous physical activity and sedentary behavior during recess: Combining GPS and accelerometry

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: The school setting can be highly influential for developing and maintaining healthy behaviors in children, such as being sufficiently physically active and preventing sedentary behavior. Physical activity (PA) during recess is indicated as major contributor of the daily recommended amount of PA. Recess time can be divided in indoor and outside play, in which outside play is generally associated with higher PA-levels. PA-levels during recess can be influenced by several physical features of the schoolyard, often referred to as a PA-supportive physical environment. Besides a PA-supportive physical environment a supportive social environment and school policy (political environment) might be beneficial for children's PA-level and sedentary behavior during recess. This study investigates the association between schoolyard characteristics and children's moderate-to-vigorous physical activity (MVPA) and sedentary behaviors in recess time using objectively assessed behaviors (accelerometry) as well as objectively defined positions of children using GPS-devices.

Methods: Twenty-one primary schools were included in this study. Schoolyard characteristics were gathered with respect to physical, social and political environmental characteristics by mapping schoolyards through systematic observations and conducting interviews with the school's principal.

In the fall of 2012 144 8-to-12 year old children wore an accelerometer (Actigraph, GT3X+) and GPS-device (Qstarz, BT1000). Accelerometer- and GPS-data were combined using the Personal Activity and Location Measurement System (PALMS) software. Data was aggregated to a 15-second epoch. All schoolyards were digitalized in GIS (ArcGIS, version 10.2) and included PALMS-data in GIS consisted of information about the presence of children in the schoolyard environment during recess and their activity level.

Multilevel level regression analyses will be conducted to adjust for a nested data structure by schools, in which the physical, social and political schoolyard characteristics are included as independent variables and MVPA and sedentary behavior as dependent variables.

Results: The association between the characteristics of three different environmental domains of the schoolyard environment and children's MVPA and sedentary behavior in recess will be presented separately for both behaviors.

Conclusions: The associations between the schoolyard characteristics and MVPA and sedentary behavior will be discussed. Implications and recommendations for future research and schoolyard interventions will be presented.

P2.172

Cross-sectional analysis of weekly levels and patterns of objectively measured physical behaviour with cardiometabolic health in middle-aged adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Physical activity is a complex, multidimensional behaviour. Little is known how inter-related, weekly patterns of physical activity (light activity and moderate-to-vigorous physical activity (MVPA)) and sedentary behaviour are associated with cardiometabolic health. The purpose of this paper is to identify weekly patterns of physical activity and sedentary behaviour and to examine cardiometabolic health status associated with different activity patterns.

Methods: Data are from a cross-sectional subsample of the Mitchelstown cohort; 475 (59.7±5.5 years) middle-aged adults. Participants wore the wrist GENEActiv accelerometer for 7-consecutive days. Data was summarised into 60s epochs and each time interval categorised based on thresholds. Latent profile analysis (LPA) defined classes based on observed clustering of sedentary behaviour and physical activity variables while multivariate latent class regression was used to compare cardiometabolic health status across classes.

Results: LPA revealed 4 distinct physical behaviour patterns; Sedentary Group (20.9%), MVPA and High-Sedentary Activity Group (40.9%), MVPA and High-Light Activity Group (24.7%) and a Physically Active Group (13.5%). Overall the Sedentary Group had poorer outcomes, characterised by high Body Mass Index, triglycerides, fasting plasma glucose and insulin levels, and low high density lipoprotein-cholesterol levels. The remaining classes were characterised by healthier cardiometabolic profiles as sedentary behaviour decreased and physical activity increased.

Conclusions: The classification of groups of adults with similar physical behaviour patterns offers important information for the identification and tailoring of public health and health promotion messages and intervention strategies. These findings could help identify optimal patterns of physical behaviour that improves cardiometabolic health as health policy should be directed towards altering patterns of behaviour rather than concentrating on a single type of behaviour.

P2.173

Are low levels of physical activity confidence and high levels of perceived barriers to physical activity encouraging sedentary behaviour?

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Introduction:

Perceived barriers to physical activity (PBPA) and physical activity confidence (PAC) are modifiable factors which determine PA levels and subsequently influence how practitioners develop PA interventions. The purpose of this study was to investigate time spent in sedentary behaviour by adolescents and determine the relationship between PBPA, PAC and sedentary behaviour.

Methods:

232 participants (11.8-13.8 years) wore Actigraph accelerometers (GT1M and GT3X) for a period of 9 days, and completed a self-report questionnaire on PBPA and PAC. Average total weekday sedentary, average total weekend day sedentary and overall average total sedentary minutes were calculated using the Evenson et al. (2008) cutpoints. Overall scores for PBPA and PAC were calculated using questionnaire data.

Results:

On average participants spent 657.31 minutes per day (73% of waking hours) in sedentary behaviour. Participants spent significantly ($p<0.001$) more time in sedentary behaviour on weekend days (681.27 ± 72.02 minutes) than on weekdays (650.14 ± 51.34 minutes) and males accumulated significantly less time ($p=.003$) in sedentary per day (646.42 ± 51.24 minutes) than females (666.44 ± 48.18 minutes). A standard multiple regression was used to assess the ability of PBPA and PAC to predict time spent in sedentary behaviour. The total variance explained by the model was 7%. Only PAC was statistically significant ($p<.001$), recording a higher beta value than PBPA. The relationship between time spent in sedentary and PAC was further investigated using a Pearson product-moment correlation coefficient. There was a small, negative correlation between the two variables ($r=-.257$, $p<.001$), with higher levels of confidence somewhat associated with lower levels of sedentary behaviour.

Conclusion:

This study strengthens the argument that PA has been engineered out of young people's lives with adolescents spending too much time in sedentary behaviour. Traditionally, PBPA and PAC are considered modifiable constraints which can lead to increased PA when specifically addressed in an intervention programme. However, findings from this research suggest that it would be more advantageous to target PAC in PA interventions when seeking to see a change in sedentary behaviour. When considering activity levels [moderate to vigorous PA (MVPA)] further research into PBPA, PAC and MVPA is essential.

P2.174

The perceived environment, sedentary behaviour, and physical activity during cardiac rehabilitation: An issue not to be ignored

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: Little is known about the role of the perceived environment from a physical activity / sedentary behaviour perspective in cardiac rehabilitation (CR) patients. Therefore, the present study examined the associations between the minutes per day of sedentary behaviour / moderate to vigorous physical activity (MVPA) and CR patients' perceptions regarding their neighborhoods' cohesion, aesthetics, street connectivity, and crime.

Methods: Patients from the *ENCORE* study were asked to wear an accelerometer + GPS unit for 9 days at the beginning (i.e., within the 1st 3 weeks) and end (i.e., within the last 2 weeks) of CR and complete a social ecological survey that included a neighborhood cohesion scale and the abbreviated NEWS-A. The patients' addresses were geocoded in ArcGIS 10.0 and linked to their respective community boundaries using the Nova Scotia Community Counts database. Once completed, community level socioeconomic status and urban vs. rural covariates were created.

Results: There were 190 patients (44 female; 146 male) at baseline and 155 at the end of CR who had ≥ 3 valid days (i.e., ≥ 10 hours of wear time / day) of accelerometer data to be included in the analysis. Multiple regression analyses showed that sedentary behaviour was significantly associated with neighborhood cohesion (beginning of CR $\beta = -.19$, $p < .01$; end of CR $\beta = -.17$, $p < .05$), neighborhood aesthetics (beginning of CR $\beta = -.25$, $p < .01$; end of CR $\beta = -.20$, $p < .02$), and neighborhood crime (end of CR $\beta = .19$, $p < .03$) controlling for age, gender, income, community SES, and urban vs. rural community. On the other hand, only neighborhood aesthetics (beginning of CR $\beta = .29$, $p < .01$; end of CR $\beta = .18$, $p < .02$) was significantly associated with MVPA.

Conclusion: CR programs need to recognize the potential importance of their patients' perceptions of their neighborhoods from a sedentary / MVPA perspective. Further, it is important to recognize that these neighborhood perceptions may have differential effects on their patients' sedentary behaviour and MVPA.

P2.175

THE RELATIONSHIP BETWEEN STUNKARD IMAGES, BMI AND PERCEPTION OF SELF-CONCEPT IN SPANISH ADOLESCENTS

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SIG: Yes, Motivational dynamics

Awards: Yes, for the Early Career Award

Purpose:

The aim of this study was to examine the relationships between an objective measurement of Body Mass Index (BMI), a perception of the body image with Stunkard figure Rating Scale, as well as perception of self-concept in youth scholars from Extremadura (Spain).

Methods:

The sample was formed by 1042 youth scholars from Extremadura (Spain), both males (N = 510) and female (N = 532), ranging in age from 15 to 17 years old (M = 15.42; SD = 0.86), belonged to different High Schools from Extremadura (Spain). Participants were measure through height and weight, and were asked to select the figure that best resembled their current body size on the Stunkard's figure rating scale. Finally, the adaptation into Spanish by Moreno & Cervelló (2005) of the Physical Self-Perception Profile (Fox & Corbin, 1989) was used to measure perception of self-concept.

Results/Findings:

The outcomes revealed normal values in BMI in participants (BMI = 21.74), and Stunkard figure rating Scale. Moreover, results showed a significant relationship between BMI, Stunkard's current body size and perception of self-concept. Besides, self-concept emerged as a strong predictor of estimated physical dissatisfaction.

Conclusions:

The results showed the importance of the body size and body status in order to have a good perception of self-concept. Furthermore, these outcomes highlighted the importance to have an adequate body status in order to improve psychological factors, mainly in adolescents' ages. Finally, the study concluded that current body size is a potentially useful indicator to measure weight status of adolescents when assessed and self-reported are not available. Further investigations are needed to enhance the knowledge about body status.

P2.176

DIFFERENCES IN MOTIVATION, PHYSICAL ACTIVITY AND DIARY SITTING TIME BETWEEN MALES AND FEMALES IN AN ACTIVE PROGRAM CALLED "MOVIL-ÍZATE".

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose:

The aim of this study was to test the relationships and differences between male and females adolescents in motivation towards physical activity, levels of physical activity and diary sitting time in a sample size of teenagers from Extremadura (Spain).

Methods:

The sample was formed by 1042 youth scholars from Extremadura (Spain), both males (N = 510) and female (N = 532), ranging in age from 15 to 17 years old (M = 15.42; SD = 0.86), belonged to different High Schools from Extremadura (Spain). Participants were measured through International Physical Activity Questionnaire (IPAQ: Hagstromet et al., 2008), motivation through a Spanish version (BREQ-2: Moreno-Murcia et al., 2007) of the Behavioral Regulation in Exercise Questionnaire (BREQ-3: Wilson et al., 2006). Moreover, to assess diary sitting time, a question was asked to participants (How many hours do you usually watch TV or play videogames or use computers?), in order to know their daily sedentary time.

Findings:

The outcomes showed differences between males and females participants in total METs, daily sitting time and amotivation, revealing greater values in girls comparing to boys. On the other side, male individuals showed higher scores in intrinsic motivation towards physical activity, respecting females' participants. Moreover, it is important to note the positive relationship between intrinsic motivation and METs total, whereas a negative relationship emerged between intrinsic motivation and daily sitting time.

Conclusions:

The outcomes of the research revealed the importance of intrinsic motivation in order to promote physical activity among teenagers. Furthermore, this regulation emerged as an important factor to avoid sedentary behaviors in adolescents. To conclude, the study demonstrated that promote intrinsic motives to practice is crucial to generate healthy habits in teenagers. Further investigations are needed to enhance the knowledge about the relationships between physical activity, sedentary behaviors and motivation in early ages.

P2.177

Music tempo: A regulating tool for walking intensity

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Current physical activity (PA) guidelines recommend that PA should be at least moderate intensity to elicit health benefits (Department of Health, 2011). It is often difficult to regulate PA intensity in free-living individuals. This study investigated if music tempo can prompt a desired walking cadence, and if music can provide a stimulus to regulate PA intensity in a longitudinal PA intervention with free-living adults.

Methods: Overweight adults ($n=37$; 94.26 ± 17.11 kg; 49.63 ± 12.37 years) were randomly assigned to an intervention (IG) ($n=17$) or usual care group (UC) ($n=20$) as part of a nine month walking intervention. IG participants walked to self-selected music with a predetermined tempo based upon Rowe et al. (2011) height related stride rate guidelines.

At baseline, 4, 6 and 9 months participants were asked to walk at their habitual pace (0-2 minutes) and then in time to a predetermined tempo (2-8 minutes) designed to elicit moderate intensity. Cadence response and intensity were assessed using hand-counted steps and heart rate (bpm) recorded using wireless telemetry. A repeated measures GLM examined differences between groups over time ($p<0.05$). All data is presented as means \pm SD.

Results: At each assessment point both groups displayed an immediate cadence adjustment in response to music tempo ($p=0.01$). This acute response was more prolonged in IG participants during each assessment. A significant difference was found between IG and UC cadence response to music throughout the nine month study ($p=0.001$). IG participants displayed an increased habitual cadence (0-2 minutes) at each assessment point (110 ± 9 , 121.80 ± 7.5 , 121.46 ± 10 , 121.93 ± 7 steps/min respectively). UC participant's habitual cadence decreased from 0-9 months (120 ± 10 , 116 ± 13 , 119 ± 12 and 119 ± 9 steps/min respectively). IG participant's HR response decreased within walking stages and between assessment points even though cadence response increased ($p<0.01$). UC HR response was sporadic without a significant increase in cadence.

Conclusion: Music tempo may be a useful regulatory tool to prompt the free-living individuals to achieve an appropriate stride rate to achieve a walking pace that is at least moderate intensity.

P2.178

Longitudinal Changes in Sedentary Time and Physical Activity during Adolescence

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Background:

Low levels of physical activity and high time spent in sedentary activities have been associated with unfavourable health outcomes in adolescents. During adolescence, sedentary time increases and physical activity declines, but little is known about whether the magnitude of these changes differs within or between school-time, after-school time or at weekends.

Objective:

To describe the longitudinal changes in the level of objectively measured sedentary time, LPA and MVPA during school-time, after-school and at weekends over three years in adolescents aged 12 years at baseline, and to assess if the magnitude of change differs between the school, after-school and weekend segments.

Methods:

Adolescents (n=363) participating in the PEACH (Personal and Environmental Associations with Children's Health) project provided accelerometer data at 12 and 15 years of age. Data were collected in 2008/2009 and 2012/2013. Overall physical activity (counts per minute (cpm)) and time spent sedentary (<100 cpm), in light physical activity (LPA (100-2295cpm)) and in moderate to vigorous physical activity (MVPA: ≥ 2296cpm) were generated for school-time, after-school time and for weekends using school-specific start and finish times. All data were analysed in 2014.

Results:

The proportion of time spent sedentary significantly increased during school (+8.23%, 95% CI = +7.35 to +9.13 to), after school (+6.99%, 95% CI = +5.92 to +8.07) and at weekends (+6.86%, 95% CI = +5.30 to +8.68). A parallel decrease was found in the proportion of time spent in LPA during school (-7.62%, 95% CI = -7.74 to -6.98), after-school (-7.01%, 95% CI = -7.74 to -6.28) and at weekends (-6.71%, 95% CI = -7.74 to -5.68). The proportion of time spent in MVPA remained relatively stable during school (-0.64, 95% CI = -1.11 to 0.18), after school (0.04%, 95% CI = -0.067 to 0.62) and at weekends (0.28%, 95% CI = -0.72 to 1.27).

Conclusions:

Objectively measured sedentary time increased between 12 and 15 years of age during-school, after-school and at weekends suggesting that interventions to reduce the age-associated changes in sedentary time are needed in all three time contexts.

P2.179

Acceptability trial of a theory-based sedentary behaviour reduction intervention for older adults ('On Your Feet to Earn Your Seat')

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose:

Adults aged 60+ spend most time sitting and least time physically active. This study tested the acceptability of a theory-based intervention to reduce sedentary behaviour (sitting) and increase physical activity in older adults.

Methods:

A pre-post trial design was used, with two independent samples of UK adults aged 60-75 and sedentary (≥6h daily sitting). Sample 1 (n = 22), recruited through sheltered accommodation, was highly physically inactive (<30 consecutive minutes activity/week). Sample 2, recruited through community centres, was less inactive (<150 consecutive mins/week). Participants received a booklet, based on habit theory, containing motivational text on the importance of reducing sitting, and offering 16 'tips' designed to displace sitting with activity and create activity habits, with eight weekly self-monitoring 'tick-sheets' to record adherence to tips. At baseline (T1), 4 (T2) and 8 weeks (T3), quantitative measures were taken of walking, moderate activity, and sitting duration (weekly mins; IPAQ). At T3, tick-sheets were collected and a qualitative interview conducted. Mixed-methods analyses were used. For each sample in isolation, descriptive statistics revealed attrition and adherence, and ANOVA assessed pre-post differences in behaviour. Interviews from both samples combined were thematically analysed.

Results:

Attrition was high in Sample 1 (22 participants consented; 12 [55%] completed), and low in Sample 2 (32 consented; 26 [81%] completed). Mean adherence to tips was 39% in Sample 1 and 51% in Sample 2. No behaviour change was observed in Sample 1. In Sample 2, walking time increased (T1: 258.57, T2: 383.07, T3: 419.23; p<.01), and sitting time decreased (T1: 3504.03, T2: 2946.73, T3: 2463.46; p<.05). Participants in both samples found the intervention easy to use, and reported changes in behaviour, health and wellbeing.

Conclusions:

High attrition and low adherence in Sample 1 indicates the difficulty of intervening with the most inactive older adults. Lack of changes in IPAQ measures in Sample 1 conflicted with behaviour and health benefits reported in interviews, suggesting some participants may have given unreliable IPAQ responses. Nonetheless, among completers in both samples, the intervention appeared acceptable. An exploratory controlled trial, using an amended IPAQ and additional health and wellbeing measures, is underway.

P2.180

Physical Inactivity in College Students and a SDT-Based Intervention to Increase Future Intention to Participate Leisure-time Physical Activity

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: Drawing from self-determination theory (SDT), this study intends to examine the effect of an autonomy supportive, well-structured and interpersonally involving teaching style on physical education class participants' future intention to participate in leisure-time physical activity.

Methods: 50 self-reported physically inactive Chinese college students (those who report not to participate in any physical activity other than compulsory PE classes) were randomly assigned into two groups, experimental group (n=25) and control group (n=25). A quasi-experimental single-blind (the teacher was not told that the participants were inactive students) experimental design was carried out, delivering 4-month-long 16 dance teaching sessions for both groups by the same teacher, once per week, 1.5 hours per session. An initial and a final measurement was taken in both groups, with each student receiving a 10-minute-long semi-structured interview and the Chinese version of Basic Psychological Needs in Exercise Scale.

Results: In the initial measurement, there was no significant difference between the experimental group and control group on the autonomy, competence and relatedness need satisfaction scores; in the final measurement experimental group's autonomy, competence and relatedness need satisfaction scores are significantly higher than control group. In the initial measurement there was no significant difference between the experimental group and control group regarding their future intention; in the final measurement the experimental groups' future intention score was significantly higher than the control group. In addition, the teacher-reported main characteristics of the inactive students were: low involvement and passive participation, physical incompetence, avoidance behavior and not interacting enough with other students during class. Most of the students report a negative attitude towards physical activity. Regarding their reasons for not participating in physical activity in leisure time, having no time, incompetence, no partners, inconvenient sport facilities are the most frequent reasons.

Conclusions: The intervention was successful in significantly increasing the basic psychological needs satisfaction of the participants and the future intention to participate in leisure-time physical activity. Teacher-reported basic characteristics of the inactive students were examined. Incompetence in physical activity is the biggest reason to stay inactive. In the future, actual physical activity participation other than future intention should be examined.

P2.181

How stable are patterns of time use in retirement?

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

Investigation of multidimensional patterns of behaviour is important when exploring health outcomes. Cluster analysis is typically used for such analysis. Yet few studies have investigated the trajectory or stability of activity clusters longitudinally. This study aims to investigate both the changing patterns and cluster membership trajectory and stability over the first 12 months of retirement.

Method:

Post-retirement data from a longitudinal, observational study of activity across retirement (collected between April 2012 and July 2014) are analysed in this study. Participants (total sample n = 141; this analysis n = 108) were aged 50 years or more and living in Adelaide or Brisbane, Australia. Self-reported time use from the Multimedia Activity Recall for Children and Adults (MARCA), a computer-assisted 24 hour recall was collected at three (T1), six (T2) and 12 months (T3) post-retirement. Two-step cluster analysis was used to identify time use clusters at each time point using eight aggregated time use variable inputs. Cluster types, and cluster membership trajectory and stability were explored across time points.

Results:

Three clusters were generated for each time point. Only one cluster type was consistent between two time points. At T1, one cluster was characterised by chores (Chores cluster), one by physical activity (PA cluster) and one by quiet time and work (Quiet Worker cluster). At T2, the Chores cluster remained, and clusters characterised by screen time (Screen cluster) and sociocultural activities and physical activity ((Cultural Active cluster) were apparent. At T3, the Screen cluster remained, and clusters characterised by work/study/computing (Work cluster) and self-care tasks (Self-Care cluster) were apparent. Little stability was demonstrated. The Chores cluster was the most stable (50% remained between T1-T2), and 28% remained in the Screen cluster at T2. The most significant trajectories were demonstrated by 70% (n= 39) of Quiet worker and 60% (n=7) of PA cluster members transitioning to the Screen cluster (T2).

Conclusions:

It appears after 12 months of retirement, activity patterns remain quite dynamic and unstable. The lability of activity patterns could be advantageous and present opportunities to positively alter activity patterns before they become more stable further into retirement.

P2.182

Measuring physical activity in people with mental illness: the case for improving self-report assessment

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

The importance of embedding clinical physical activity programmes within treatment for serious mental illness is increasing. Physical activity has consistently been shown to improve both the physical and mental health of people experiencing mental illness, yet this population is known to be less physically active and to engage in high levels of sedentary behaviour. Coupled with high rates of smoking and poor dietary habits, physical activity is a key modifiable risk factor contributing to the significant gap in life expectancy. Given increasing interest in physical activity as a component of treatment ensuring that valid, clinically useful and feasible measures of physical activity are available for routine use is of paramount importance in order to evaluate the effectiveness of interventions. Existing self-report measures of physical activity fail to address the unique considerations and limitations faced by people experiencing mental illness. A new, dedicated self-report tool is urgently required.

Methods:

A multi-disciplinary international working group was established in Padua, Italy in April 2014 with the aim of developing a new self-report physical activity measure for use with mental health populations. Academics and clinicians with expertise in physical activity, physiotherapy, exercise physiology, psychiatry, epidemiology and public health from 18 countries have been involved in the iterative design of the new measure. We have attempted to capture existing adaptations to current tools such as the International Physical Activity Questionnaire that individual clinicians and/or services currently use when working with people experiencing mental illness. 49 clinicians and researchers completed an online survey in May 2014, with the aim of guiding the development of the new tool.

Results:

Responders to the survey overwhelmingly supported a new tool capturing total physical activity (97%) and sedentary behaviour (80%) over a one-week period (81%). The iteratively designed tool in addition to the protocol for a multi-national validation study will be presented.

P2.183

Teenagers in Leisure Time (TiLT)

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Introduction:

Sport is an influential setting for promoting the health and well-being of adolescents. However, evidence indicating decreases in sport participation throughout adolescence concurrent with increases in screen time (ST) have highlighted the need to explore whether the correlates of these specific leisure-time behaviours might differ depending on co-existing patterns of adolescent sport and sedentary behaviour.

Methods:

A cross-sectional study was undertaken in 2013 in a random sample of 12 to 16 year old youth attending eight Victorian government schools. Students completed a survey assessing engagement in leisure activities and exploring factors that may influence their participation. A two-step cluster analysis identified sex-specific groups of adolescents based on their participation in sport and ST. Further analyses then explored differences in correlates between the cluster groups.

Results: Participants (n=426, 51% boys) had a mean age of 13.6 (± 1.02), spent an average of 1506.8 (± 848.0) minutes/week in ST and 279.6 (± 264.9) minutes/week in sport; analyses revealed three groups each for boys and girls. The boys' clusters included: 1. low sport/high ST; 2. high sport/moderate ST; and 3. low sport/low ST. Girls' clusters included: 1. moderate sport/high ST; 2. low sport/low ST; and 3. high sport/low ST. Differences between groups were observed in both the boy and girl cluster groups across a range of intrapersonal, interpersonal and environmental correlates.

Conclusions:

Adolescents who engage in different combinations of sport and ST are characterised by unique intrapersonal, interpersonal and environmental correlates. These findings suggest the need for interventions to target specific adolescent groups.

P2.184

Comparison of physical activity behaviours and among Aboriginal and non-Aboriginal Australians in the Social, Economic and Environmental Factors Study (SEEF)

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Objective: Physical activity (PA) levels are lower among Aboriginal Australians than the overall population with 62% of Aboriginal people aged 15 years and over in non-remote areas sedentary or exercising at low levels. Little is known regarding how the neighbourhood environment and social support interact with PA among Aboriginal populations. We examined differences in PA behaviours and socio-environmental variables correlates among Aboriginal and non-Aboriginal participants of the 'Social, Economic and Environmental Factors [cohort] Study' (SEEF).

Methods: Cross-sectional, self-reported data from middle-older aged participants was collected in 2010 from a sub-sample of the 45 & up study. Chi-squared tests compared PA, sedentary behaviour, sleep, neighbourhood and social support in relation to achieving the upper threshold of the Australian PA guidelines for adults of at least 300 minutes of moderate intensity activity each week, according to Aboriginal status.

Results: A total of 59,489 (314 Aboriginal; 59,175 non-Aboriginal) participants were included in the analyses. Achievement of the PA guidelines were similar among Aboriginal (63.1%) and non-Aboriginal respondents (65.4%; $p=0.429$). Compared to non-Aboriginal participants, Aboriginal participants were less likely to sleep at healthy levels (65.3% versus 79.2%; $p<0.001$) and more likely to be advised by a General Practitioner (GP) to be more active (35.6% versus 22.3%). They were less likely ($p<0.001$) to trust people in their neighbourhood (78.0% versus 87.9%), perceive neighbourhood safety (83.7% versus 91.6%), have access to free/low cost recreation facilities (65.3% versus 79.2%) footpath; (45.8% versus 56.1%) and transport provision (61.8% versus 73.3%). They were more likely to agree that neighbourhood crime rate make it unsafe to walk during the day (35.4% versus 26.2%; $p=0.001$) and night (33.7% versus 26.6%; $p=0.005$). Aboriginal participants were less likely to receive help from friends (88.9% versus 94.0%; $p<0.001$) and neighbours (50.2% versus 57.2%; $p=0.014$) and to be involved in weekly meetings of social clubs, religious/other groups (44.6% versus 55.4%; $p=0.001$) than non-Aboriginal participants.

Conclusions: Despite less neighbourhood and social support, Aboriginal participants achieved similar physical activity levels to non-Aboriginal participants. This warrants further investigation.

P2.185

Mobility, muscle strength, muscle mass and physical activity in hospitalized older medical patients.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

In old medical patients low in-hospital mobility increases the risk of functional decline. However, at the same time several studies show that mobility and muscle strength improve during hospitalization. The purpose of this study was to investigate changes in mobility, muscle strength, muscle mass and physical activity during hospitalization.

Methods:

We included acute medical patients, age 65+ years. Delirious and terminal patients, patients in isolation, and patients with a planned length of stay <3 days were not included.

Assessments were performed at admission and at discharge or at day 10 (based on the average length of stay (LOS)). Assessments included physical function: mobility (DeMorton Mobility Index, DEMMI, score 0-100) and 30-second sit-to-stand (STS); handgrip strength (HGS); thickness of Quadriceps muscle measured with ultrasonography (Quad-UL); and physical inactivity per 24 hours (PI%, i.e. lying or sitting) objectively measured with ActivPal.

Results:

145 patients with multi-morbidity, age (mean(SD)) 85.2(7.4) yrs, were included. LOS was 11.7(6.0) days. Changes from admission to discharge: DEMMI score: 51.1(15.3) to 55.4(15.6), $p<0.0001$; STS (#): 3.6(4.3) to 4.8(4.7), $p<0.0001$; HGS (kg): 19.0(7.0) to 18.9(6.9), $p=0.6372$; Quad-UL (cm, $n=107$): 1.26(0.36) to 1.18(0.37), $p=0.0003$; PI (% $n=101$): 91.2 (7.9) to 91.5(6.8), $p=0.3210$. P-values are based on paired t-test. Using a cut-point of 95% PI showed that those who were more physically inactive had the greatest loss of muscle mass (data not shown).

Conclusions:

Physical function improved during hospitalization while handgrip strength was unchanged. One reason for this could be that very frail patients need to use their arms for support and this maintains muscle strength. On the other hand, lack of weight bearing activities increases the loss of muscle mass in the lower extremities as indicated by our results. Improvements in physical function could be a result of the medical treatment and the fact that patients become less ill. Our results suggest that the improvements in physical function mask the underlying loss of muscle mass which may be detrimental for post discharge activities of daily living. Consequently, efforts to increase physical activity during hospitalization should be in focus.

P2.186

Seasonal variation in children's objectively-measured physical activity and sedentary time.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Variability in children's physical activity and sedentary behaviour across the calendar year has important implications for surveillance and the targeting of behaviour change interventions. This study examined seasonal variation in accelerometer-derived estimates of physical activity and sedentary time in UK children aged 7-8 years.

Methods:

Data are from the Millennium Cohort Study. Participants were invited to wear an accelerometer for 7 days on 4 occasions between November 2008 and October 2009. Outcome variables were total physical activity (mean counts/min) sedentary time (<100 counts per minute; min/day) and moderate to vigorous physical activity (MVPA; >2241 counts per min; min/day). Multi-level linear regression was used to examine the association of season of assessment with each of the outcome variables. Moderation of the seasonal association by sex, weight status, ethnicity, urban/rural location, parental income and day of week (week/weekend) was examined using interaction terms.

Results:

At least 1 wave of usable accelerometer data (≥ 600 min wear time on ≥ 2 days) was obtained from 703 participants (47% male, baseline mean(SD) age 7.6(0.3) years), who collectively provided 12668 person-days of observation. Children accumulated less sedentary time during spring (beta;95% confidence interval: -26.6;-30.5,-22.7 min/day) and summer (-30.6;-35.8,-25.4 min/day) relative to winter. Conversely, total physical activity and MVPA were higher during the spring (total physical activity: 113.8;101.5,126.1 counts/min; MVPA: 15.5;13.7,17.3 min/day) and summer (total physical activity: 105.3;88.8,121.7 counts/min; MVPA: 13.6;11.2,16.0 min/day) compared to winter. The prevalence of meeting MVPA guideline levels was 35.6% in winter, 60.4% in spring, 58.4% in summer and 38.7% in autumn. No significant interactions were observed for any of the moderators examined.

Conclusions:

Higher levels of physical activity and reduced sedentary time were observed during the spring and summer months compared to winter. Contrary to previous cross-sectional work, these associations cannot be attributed to between-individual selection effects but reflect true seasonal differences within-person. There was no evidence of effect modification across a range of anthropometric and demographic variables. Physical activity surveillance systems should account for seasonal variability when conducting assessments. It may be beneficial to implement physical activity promotion programmes during the winter and autumn months when activity levels are lowest.

P2.187

Physical activity and sedentary behaviour among inpatient adults with mental illness

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Physical inactivity and sedentary behavior are positively associated with poor physical health and may contribute to the reduced life expectancy of adults with mental illness. The aim of this study was to assess the physical activity and sedentary behaviour of adults with mental illness in an inpatient psychiatric setting.

Methods: 101 in-patient adults (72% female) aged 18-75 years (mean 40.7 years; SD 14.5) with a mental illness were recruited from a private psychiatric hospital. Participants reported time spent in walking, moderate and vigorous intensity activity in the past week and domain specific sitting time on a usual weekday and weekend day. 36 participants also provided valid accelerometry data for a minimum of three weekdays and one weekend day. Descriptive statistics were used to analyse results.

Results: The median self-reported total time spent in physical activity was 225 minutes/week (IQR: 101.25 – 600), and 65% of participants met the physical activity guidelines of at least 150 minutes per week. The median reported time in sedentary behaviour was 780 minutes/day (IQR: 555 -1020) on weekdays and 600 minutes/day (IQR: 405 – 825) on weekend days. The highest reported sitting times were for time spent doing nothing and general relaxing on both weekdays (median 120 minutes/day, IQR: 60 – 240) and weekend days (median 120 minutes/day, IQR: 60 – 240), and time spent with a health professional (median 67.5 minutes/day, IQR 46.25 - 180) on a weekday. Accelerometry results indicated the average time spent in light activity was 111 minutes on weekdays and 126 minutes on weekend days, and in moderate-vigorous intensity activity (MVPA) was 38 minutes on weekdays and 34 minutes on weekend days and the average time spent in sedentary behaviour was 672 minutes/day on weekdays and 648 minutes/day on weekend days.

Conclusions: Inpatient adults with mental illness can be meet recommended levels of physical activity. However, they spend a significant amount of time sitting each day. Strategies to reduce sitting time could focus on the time spent in general relaxation, doing nothing and time spent with a health professional.

P2.188

Development of a school-based multi-level intervention to increase physical activity and decrease sitting among youth: Lessons from a randomized feasibility trial

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: Socioeconomic health disparities, partly due to differences in physical activity (PA) levels, call for targeted intervention efforts among lower educated people. So far, no school-based PA interventions among youth have demonstrated long-term effectiveness, possibly due to inadequate development and piloting. Interventions should also measure whether participants use the intended behavior change techniques (BCTs). The Let's Move It intervention for vocational college youth targeted physical activity and sedentary behaviour, and was based on self-determination and self-regulation theories, original research and reviews of evidence. This study aims to investigate the feasibility and acceptability of the intervention and trial procedures and to present features of the optimized intervention.

Methods: A pilot cluster-randomised controlled trial, with outcome-assessor blinding, was conducted. Four classes of students (matched pairs) were randomly allocated to intervention or teaching-as-usual control group. Intervention consisted of group sessions targeting PA motivation and self-regulatory skills, and teacher-led sitting reduction in all other classes. At baseline (T1), mid-intervention (T2), post-intervention (T3) and six months after baseline (T4) we measured psychosocial mediators and self-reported PA and sedentary time. Objective assessment of PA (7-day accelerometry) was measured at T1, T3 and T4, and body composition (Tanita) at T1 and T4. Acceptability questionnaires at T3 and interviews took place post-intervention (n=15).

Findings: Blind to group allocation, 43 students (80%) gave their consent to participate. By T3, all post-intervention measures were completed by 33 students (77%), and by T4, by 12 (28%). Acceptability ratings of sessions and program were high. Process measures indicated the hypothesized changes in mediators in some but not all variables. Intervention group reported increased use of BCTs post-intervention, with goal setting and action planning among the most frequently used BCTs at T3. Use of BCTs correlated with objectively measured PA.

Conclusions: Feasibility study helped identify improvement needs, resulting in intensified habit formation and added elements to motivate for BCT use. Need for better procedures to prevent study drop-out was detected. High willingness to participate, good response rates and proof of the acceptability of the concept implies that the effectiveness of the program can next be tested in a full randomized controlled trial.

P2.189

Perceive Poor Appetite and Feeling Of Exhaustion Are Associated To Lower Level Of Physical Activity In Not Disable Community-Dwelling Elderly

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: To determine the relationship between the feeling of not appetite and exhaustion with global activity in daily life.

Methods: Data from 197 participants at InCHIANTI-FU4, 102M and 95F, 79.5±6.3ys (range 65-92ys) with MMSE≥24, no ADL disability. Participants were interviewed to assess depressive symptoms by CES-D questionnaire. Two questions from the questionnaire were used to investigate appetite and feeling of exhaustion. To categorized scores, a dummy variable was computed for each question: 0="Never or sometimes", 1="Occasionally or always". Daily activity was recorded by 3-axial accelerometer built in Samsung Galaxy SII/III (S) placed in a belt pocket on the back. Only days with more than 10h of recording time over 5 days period were considered. Time spent in global activity in daily life (GA, min/day), was computed by raw signals expressed as counts. Analysis was conducted by multiple linear regression models (MLRM).

Results: Measured GA in this sample was in average 3.38±1.1 h/day and no significant association was found with total CESD score (p=0.21). Implemented MLRM confounded by age and gender showed a negative association between time spent in activity and feeling of not appetite and exhaustion, -0.861±0.3 h/day (p<0.01) and -0.574±0.2 h/day (p<0.01) respectively.

The results were confirmed by introducing into the model other multiple factors (age, gender, MMSE, CESD, BMI, SPPB, diseases and drugs): -0.840±0.3 h/day (p=0.01) and -0.427±0.2 h/day (p=0.05) respectively.

Conclusion: Results suggest that information related to appetite and feeling of exhaustion may improve our knowledge about physical activity in elderly subjects not disable. Specific interventions to restore appetite and reduce feeling of exhaustion should be encouraged to promote physical activity.

P2.190

Time spent sitting and cardiovascular health amongst bus drivers: A pilot study

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: It is hypothesized that bus drivers exhibit greater risk factors for poor cardiovascular health due to the sedentary nature of their job in comparison to workers in other occupations. This study objectively measured sedentary behaviour and physical activity (PA) and examined links with markers of cardiovascular health, in a sample of bus drivers.

Methods: This cross-sectional pilot study assessed a volunteer sample of drivers from the East Midlands, UK. Drivers' blood pressure (BP), heart rate (HR), waist circumference (WC) and body composition (bioelectrical impedance) were measured using objective and validated tools. Participants wore an activPAL3 and ActiGraph GT3X+ for 7 days and completed a daily diary. The proportions of time spent sedentary and in light and moderate-to-vigorous PA (MVPA) were calculated during waking hours on workdays and non-workdays and during working hours and non-working hours on workdays. Valid data (>600 minutes on at least 4 days including one weekend day) were analysed using Wilcoxon-signed rank tests and Spearman-rank order correlations.

Results: 28 drivers (89.3% male, [Median±IQR] age: 45.2±12.8 years, BMI 28.1±5.8 kg/m², % body fat: 26.0±9.0%, WC: 102±21cm, BP: 137±14/88±11mmHg) provided valid objective monitoring data. A greater proportion of time was spent sitting on workdays than non-workdays (73% [731±158 mins/day] vs. 63% [502±237 mins/day]; p<0.001), and during working hours than non-working hours (85% [426±147 mins/day] vs. 70% [305±109 mins/day], p<0.001) on workdays. Drivers' spent a greater proportion of time in light PA on workdays than non-workdays (37% vs. 30%; p<0.001) and during working hours than non-working hours (44% vs. 31.5%, p<0.001). Drivers spent less than 3% of their overall time in MVPA. Time spent sitting on non-work days was positively associated with sitting at work (r=0.456; p<0.05) and sitting outside work on workdays (r=.758; p<.001). Sitting time during working hours was positively associated with resting HR (r=0.453; p<0.05).

Conclusions: Bus drivers do not compensate for their sedentary behaviour at work by being more active outside work. Prolonged sitting during working hours may negatively impact drivers' HR. The ActiGraph seems to overestimate PA during working hours. Interventions should focus on reducing sitting during breaks and days off to improve cardiovascular health.

P2.191

Preliminary findings from the Sport For Life: All Island healthy lifestyle intervention for children aged 8-9 years

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SIG: Yes, Early care and education

Awards: No

Objectives:

Participation in physical activity (PA) is a determinant of health with higher levels of PA reducing the risk of developing long term conditions. Following the results of a study in Northern Ireland that demonstrated the programme 'Sport for LIFE' enhanced levels of physical activity and reduced sedentary behaviour in 8-9 year old children (Breslin et al. 2012), the programme 'Sport for LIFE; All Island' is now being delivered to circa 4000 children from social and financial disadvantaged areas of Ireland. An investigation is currently underway to measure the impact of the programme on levels of physical activity, sedentary behaviour, nutrition and wellbeing of children aged 8-9 years. This paper describes baseline physical activity levels from the first phase of a longitudinal design study.

Methods:

A comparison of baseline subjective and objective PA levels from a subsection of a larger stratified randomised control trial was completed. Data was provided by children from areas of low socio-economic status, from Ulster and Leinster Schools in September 2014 (n = 350). Objective PA was measured with an Actigraph accelerometer, and two self-report questions to measure daily frequency and duration of PA provided subjective data.

Results:

Measurements of PA levels from participants who had provided both self-report PA and accelerometer PA (n=191) found that 20% self-reported they were meeting the World Health Organisation's (WHO) recommended guidelines of 60 minutes of Moderate-to-Vigorous physical activity (MVPA) per day. However, objective results obtained using accelerometers revealed that 9% of the same children met this criteria. Total physical activity (light and MVPA) was reported as 229.53 minutes (SD 37.17) per day. Average daily time spent in sedentary behaviour was 505.80 minutes (SD = 63.77).

Conclusions:

The difference in the self-reported physical activity level and the objective data demonstrates that these children are actually taking part in less physical activity than they subjectively report. Physical activity of primary school children across the whole of Ireland has thus far, been under-reported in PA research. These preliminary findings, as part of a larger longitudinal study currently underway, contribute to the understanding of patterns of PA in this population.

P2.192

Physical Activity through Sustainable Transport Approaches (PASTA) – innovative research approaches to investigate determinants and impacts of active transport in a cross-European project

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose:

The 4-year PASTA project (www.pastaproject.eu) takes a broad approach in investigating how active transport contributes to physical activity. It brings together perspectives from transport planning, travel behavior and health research as well as from policy and practice and applies an innovative webbased data collection strategy.

Methods:

The core study is designed as a longitudinal web-based survey including a baseline questionnaire and bi-weekly short follow-ups. Participants will be recruited opportunistically on a rolling basis, targeting to achieve 2000 subjects per city. Subsamples will be used to evaluate selected measures to support active transport in each city or to collect objective data as part of add-on modules (GPS tracking, accelerometry, air pollution exposure).

Results:

Survey contents were identified based on a comprehensive conceptual framework specifically developed for the project. The framework combines three domains of travel demand modeling, namely a rationalist mode choice approach, a socio-geographical approach including various spatial factors, and a socio-psychological approach, building on established psychological theories. The survey combines items on physical activity (adapted GPAQ), active transport and overall mobility (one-day travel diary, commute route identification) as well as psychological theories (extended Theory of Planned Behavior). Participants experiencing traffic incidents will be asked to fill out an additional crash questionnaire. The survey started in November 2014 and first experiences with a rolling recruitment and web-based data collection will be presented.

Conclusions:

PASTA pursues a multitude of scientific objectives at the nexus of active transport and physical activity research. Its design and approaches offer opportunities to tackle interdisciplinary research questions that have not been addressed or resolved by existing studies. The investigation of predictors of active transport and physical activity and application of an interdisciplinary study framework aim at combining approaches from transport, planning, public health, psychology and geography. Key objectives, including the quantification of behavior substitution between active transport and physical activity or traffic injury risks, are specifically aimed at filling existing research gaps. The study will inform further work on key challenges common with 'natural experiments', including the balance between measurement accuracy and participant burden and the successful recruitment of purposive and representative population samples. (7th EC-FP grant agreement 602624)

P2.193

Integration and sustainability of community-based health promotion initiatives – experiences and challenges from Project Health and Local Community in Denmark.

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SIG: Yes, Policies and environments

Awards: No

Project Health and Local Community is an evidence-based health promotion project, which is implemented in selected local communities in the Danish municipalities of Bornholm and Odsherred. The objective of the project is to promote health and wellbeing of families with small children. This is achieved by mobilising community resources, strengthening social networks, and promoting healthier food choices and more physical movement. The project is based on the conception that participation of stakeholders stimulates motivation, ownership and sustainability of interventions. Children and parents as well as other citizens and professionals affiliated to the local community are therefore actively involved in all stages of development and implementation of interventions. The project is implemented in partnership with municipal authorities, private retailers, non-governmental organizations, mass media and research institutions. The wide representation of local stakeholders makes it possible to integrate actions across settings such as kindergartens, primary schools, supermarkets and more public spaces such as town squares and recreational areas. This promotes synergistic effects and sustainability of interventions.

Securing integration across stakeholders and settings has been a challenge for Project Health and Local Community. The many stakeholders have different rationales for participating in the project. Some participate because they reside in the involved communities while others participate because they have a professional engagement there. The need for participants to define a common vision for their local community gradually became apparent. So did the need for a common forum for dialogue, planning, coordination and evaluation. The project therefore established a broadly represented partnership forum across involved communities as well as local action groups within each of the involved communities. The local action groups comprised ordinary citizens as well as formalised partners. It was soon realised that these groups were important structures in the process of securing project integration and sustainability. However, it also turned out that the local action groups were not sustainable in the long because they missed a formalised and legal status. On the basis of interviews with members of the local action groups this presentation focuses on the experiences and challenges of integration and sustainability of complex interventions in the local community.

P2.194

Influences on screen-viewing behaviour in adolescents.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Screen-viewing is the most pervasive sedentary behaviour among adolescents. An understanding of the correlates of screen-viewing is important to the development of effective interventions. Screen-viewing is likely to have a strong habitual component and also be influenced by social and physical environment factors. The purpose of this research was to examine the relationship between habit strength, the home environment and parental norms, and adolescents' screen viewing behaviour.

Methods: Participants were 607 adolescents (mean age 13.9 yrs, range 11-17; 56% male; 96% white British) recruited from two schools in Lanarkshire, Scotland. Participants completed a survey that assessed: self-reported leisure time screen viewing, habit strength, physical activity, sleep duration and quality, screen-viewing opportunities in the home, parental norms and demographics. Informed consent was obtained from the Local Education Authority responsible for each school and from the head-teacher in each school. Participants indicated their assent to participate. Relationships were explored using correlation and regression.

Results: Median daily screen-viewing per day was 390 mins/day. There were no differences between males and females in total screen viewing ($p > .05$). Significant correlations were observed between average daily screen-viewing and habit strength ($r = .46$), parents think I do too much screen use ($r = .33$), preferences for TV over physical activity ($r = .29$), usual weekday sleep duration ($r = -.26$), enjoyment of TV ($r = .22$), parental restrictions on screen use ($r = -.17$), fathers screen-viewing ($r = .17$), mothers screen viewing ($r = .16$), physical activity ($r = -.14$), age ($r = 0.12$), number of screens participant had access to ($r = .12$), sleep quality ($r = .11$), and number of screens in the house ($r = .10$). These significant correlates were entered into a regression which was significant ($F_{(13, 498)} = 16.4$, $p < .05$) and explained 28.1% of the variance in average daily screen viewing. Significant predictors ($p < .05$) were habit score ($\beta = 0.31$), parents think I do too much ($\beta = 0.16$), enjoyment of TV ($\beta = 0.11$), usual weekday sleep ($\beta = -0.14$), and age ($\beta = .08$). Similar patterns of results were observed for weekday and weekend day screen viewing.

Conclusions: Habit strength is a strong predictor of screen-viewing in adolescents. Reducing screen-viewing may require a focus on disrupting the environmental factors that automatically cue these behaviours.

P2.195

Mothers' perceived proximity to green space is associated with television viewing time in children: the Growing Up in Scotland study.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: To investigate whether mother's perception of distance from home to green/open spaces is associated with their child's screen time.

Method: We used mother-reported data from sweep six (2010-2011) of the Growing Up in Scotland study ($n = 3,586$ children aged 5.9 yrs) to examine associations between walking distance from home to green/open space and screen time (TV viewing time/computer use). Analyses were adjusted for age, sex and other pre-specified covariates, including sport/exercise participation, mental and general health, birth weight, parental socio-economic group (SEG) and smoking status.

Results: Overall, 32.1% of the sample exceeded the recommended maximum of ≥ 2 h/day TV viewing. Children living > 20 minutes' walking distance from green/open spaces displayed 2.1 hours (95% CI, 0.65 to 3.51) more weekly TV time than those living < 5 minutes walking distance. Compared to children living < 5 minutes away, those in the > 20 minutes category had worse mental health (mean Strengths and Difficulties Questionnaire score \pm SD, 7.0 ± 4.6 vs. 8.7 ± 6.2) and general health (% fair-poor, 4.6 vs. 8.6), and were more likely to come from lower SEG households.

Conclusion: Mothers' perceived distance from home to green/open spaces was associated with child's TV time at age 5.9 years. Parents who perceive the environment to be "unsafe" may restrict children's discretionary time in green/open spaces. Thus these children may spend more time in the home. Features of the home environment, such as the number of household TVs, are known to be associated with sedentary behaviours so restricting children's play to the home environment may promote engagement in sedentary activities.

P2.197

Stroke survivors should do more than stand up for their health.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

In the general population sedentary behaviour is emerging as a risk factor for an array of medical concerns. Sedentary behaviour is commonly defined as "any waking behavior characterized by an energy expenditure ≤ 1.5 metabolic equivalent of task (MET) while in a sitting or reclining posture". It is unknown if this definition applies to stroke survivors; levels of energy expenditure that represent sedentary behaviour in stroke survivors may be very different from those described for the general population. Before clinical recommendations can be developed to reduce sedentary behaviour, the physiological characteristics of sedentary behaviour in stroke survivors need to be determined. The objective of this study was to determine energy expenditure among stroke survivors across several activities that approximate sedentary behaviour.

Methods:

Energy expenditure of 27 stroke survivors (mean age 61.0 ± 11.7 years) was measured using indirect calorimetry and expressed in METs. The recorded values were calculated for every subject and averaged for each activity: lying, supported and unsupported sitting, standing, wheelchair propulsion and walking. Calculations were done for the total group as well as categorised by the Functional Ambulation Categories (FAC).

Results:

For the total group mean METs were 1.04 ± 0.11 for sitting supported, 1.09 ± 0.15 for sitting unsupported, 1.31 ± 0.25 for standing, 1.91 ± 0.42 for wheelchair propulsion and 2.52 ± 0.55 for walking. Supported, unsupported sitting and standing showed a METs lower than 1.5 for all FAC, with the exception of subjects classified as FAC 0, who showed a MET value of 1.6 ± 0.22 during standing. Stroke survivors in all FAC showed MET values above 1.5 when propelling a wheelchair or walking.

Conclusions:

There is variability in the physiologic stimulus once support or activity is changed. The findings of this study demonstrate that the energy expenditure during typical sedentary behaviours (sitting supported and unsupported) is very narrowly bounded around 1.0 METs. Energy expenditure during sitting and standing was ≤ 1.5 METs for all FAC levels, with the exception of FAC 0 (1.6 METs during standing). Independent wheelchair propulsion and walking seem to be light intensity activities (≥ 1.5 METs) that can be used to interrupt sedentary behaviour in stroke survivors.

P2.198

Descriptive study of sedentary behaviors in 35,444 French working adults: cross-sectional findings from the ACTI-Cités study

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Sedentary behavior is increasingly recognized as a public health concern. However, there is currently a lack of detailed information on different types of sedentary behaviors and the context in which they take place, sedentary behavior being assessed in most previous studies by total sitting time or time spent viewing television.

The purpose of this study was hence to explore and describe the prevalence of a wide range of sedentary behaviors, according to type of day (work or non-workday), occupation type, and perceptions towards physical activity, in a large sample of adults.

Methods: We used a cross-sectional design to assess sedentary behaviors in 35,444 working adults (mean \pm SD age: 44.5 ± 13.0 y) from the French NutriNet-Santé web-based cohort. Participants self-reported sedentary time, assessed by mean daily hours spent sitting in different domains (work, transport, leisure) and spent in common sedentary leisure activities (TV/DVD, computer and other screen-based activities, non-screen-based activities) on workdays and non-workdays, along with occupation type (jobs involving mainly sitting to heavy manual work) and perceptions towards physical activity. Regression models were used to investigate, by day type, associations of sedentary time with occupation type and perceptions towards physical activity, controlling for socio-demographic factors.

Results: Mean (\pm SD) sum of daily sitting time was $7.47 (\pm 4.22)$ h/day for workdays and $4.04 (\pm 2.70)$ h/day for non-workdays. Time spent in sedentary leisure activities amounted to $4.69 (\pm 3.70)$ and $5.39 (\pm 3.27)$ h/day for work- and non-workdays, respectively. The amount of sedentary time differed by day type and occupation type, with higher amount of sedentary time outside of work in those with sedentary occupations, especially on workdays. Negative perceptions towards physical activity were associated with higher amount of sedentary time outside of work, irrespective of day type.

Conclusions: A substantial amount of waking hours was spent in different sedentary behaviors for workdays and non-workdays. Being sedentary at work was not associated with lower sedentary time outside of work. Negative perceptions towards physical activity may influence the amount of time spent in sedentary behaviors. These findings may help in defining target groups when designing public health interventions to reduce sedentary behaviors in adults.

P2.199

Investigating the clustering of determinants of television viewing and eating behaviours in 11-12 year old children

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Evidence suggests that television viewing (TV) and unhealthy eating behaviours are prevalent and often co-occur (cluster) in young people. However, evidence on the co-occurrence of determinants of these behaviours is lacking. Examining whether determinants of behaviours co-occur would provide insight into whether targeting changes in determinants of one behaviour could potentially lead to changes in a related behaviour. This study examines the co-occurrence of determinants of TV viewing and unhealthy eating behaviours among children.

Methods: Children (n=527) aged 11-12 years self-reported how much time they usually spent watching TV and how frequently they consumed energy-dense (ED) snack foods. Habit for TV viewing, habit for eating ED snacks whilst watching TV, self-efficacy for limiting TV viewing, self-efficacy for limiting ED snack consumption, and self-efficacy for limiting ED snack consumption while watching TV were self-reported.

Results: Results showed that not only do TV and ED snack consumption co-occur ($B=0.01$, $95\%CI=0.004-0.02$), but also their habitual ($B=0.65$, $95\%CI=0.56-0.73$) and self-efficacy ($B=0.47$, $95\%CI=0.38-0.57$) constructs. Furthermore, TV viewing habit (low propensity to the habit) was associated with self-efficacy to reduce TV viewing ($B=0.21$, $95\%CI=0.11-0.30$), and the habit of eating ED snacks whilst watching TV (low) was associated with self-efficacy to reduce eating ED snacks at the TV ($B=0.30$, $95\%CI=0.21-0.39$). All habit and self-efficacy constructs were associated with behaviours.

Conclusions: TV viewing and ED snack consumption co-occur as do the constructs of habit and self-efficacy for these behaviours. This knowledge offers opportunities for more effective intervention development. Further research is needed in this area.

P2.200

Children's television viewing and eating behaviours: the importance of parental behaviour

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: Television (TV) viewing and unhealthy eating behaviours are prevalent among children and have been shown to be associated with negative physiological and psychosocial health outcomes. Improving such behaviours requires an understanding of the factors that influence these behaviours. This study examines associations between parental behaviours (TV viewing and eating behaviours) and TV viewing and eating behaviours in children aged 5-6 years and 11-12 years.

Methods: Parents of 126 children aged 5-6 years reported how much time their child usually spent watching TV, and how frequently their child ate fruit, vegetables and energy-dense (ED) snack foods. Children (n=166) aged 11-12 years and parents of both sets of children self-reported how much time they usually spent watching TV, and how frequently they ate FV and ED snack foods.

Results: Parental intake of fruit and vegetables was positively associated with fruit and vegetable intake in younger (Fruit: $B=0.33$, $95\%CI=0.22-0.50$; Vegetables: $B=0.41$, $95\%CI=0.24-0.57$) and older children (Fruit: $B=0.26$, $95\%CI=0.05-0.48$; Vegetables: $B=0.26$, $95\%CI=0.11-0.41$). Parental intake of ED snacks was positively associated with ED snack intake in younger children ($B=0.53$, $95\%CI=0.36-0.69$), but not in older children. Parental TV viewing was associated with TV viewing among younger children (weekday TV: $B=0.49$, $95\%CI=0.40-0.58$; weekend day TV: $B=0.37$, $95\%CI=0.22-0.46$), but not in older children.

Conclusions: Parents TV viewing and eating behaviours are associated with their children's behaviours. This association is strongest ages 5-6 years. Encouraging parents to improve these behaviours are important strategies to test to reduce TV viewing and improve eating behaviours in children.

P2.201

Structures and social norms define sedentary behaviours in Finnish preschools

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SIG: Yes, Early care and education

Awards: No

Purpose: All forms of sitting behaviors, jointly called as sedentary behaviors, have increased among preschool children. The effective interventions to reduce sitting time in preschool setting can be developed when the barriers and facilitators of decreasing children's sitting are recognized. Based on the socioecological approach, this qualitative study aimed to study early education professionals' opinions on sitting time in preschool setting.

Methods: Four semi-structured focus group interviews for early education professionals were held in 2014. The interviews consisting of four themes were conducted in different preschools. A deductive thematic analysis was conducted for the interviews with the help of qualitative data analysis software (NVivo10). A data framework to code the data, which was based on the major themes of the questioning route and socioecological model, was used by two independent researchers.

Results: The sitting time in preschool concentrates on the daily structures (e.g. morning and lunch sessions) and routines in preschools. The routines and habits are easier to follow in hectic days whereas planning and implementing activity breaks is considered more time-demanding. It is a common social norm that children need to learn sit already in early age. Early education professionals consider also that sitting too much is not a problem in preschool settings whereas the most of children's sitting time happens at home. Of physical environment factors, small rooms and noise levels are considered as barriers of decreasing sitting time in preschools. However, electronic equipment is seldom used in preschools. If the weather is poor, more attention is paid to that all children are active in preschool yards. In addition, having children from aged three to six in same group forces early education professionals consider activity breaks in daily program. The longer careers in preschools provide also more self-efficacy and knowledge to motivate children to break the sitting time.

Conclusions: The awareness of early education professionals needs to be raised concerning the children's sitting time. Providing early education professionals with ready-to-use materials to implement more activity in the daily structures is beneficial in future intervention.

P2.202

Associations of sitting behaviour with incident diabetes over 10 years: evidence from the Whitehall II cohort study

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Although isolated indicators of sedentary behaviour have been linked to broad metabolic risks, prospective studies with incident diabetes as the outcome are scarce, inconclusive and do not always disentangle the role of confounding by adiposity or physical inactivity. This study investigated the associations between total and context-specific sitting and incident diabetes in a longitudinal cohort of mid-aged to older British Civil Servants.

Methods: Using data from the Whitehall II Cohort Study, multiple logistic regression models (adjusted for age, sex, ethnicity, employment grade, smoking, alcohol intake, fruit and vegetable consumption, self-rated health, physical activity and BMI) were fitted to examine associations between total and context-specific sitting time (work, TV viewing, non-TV leisure time sitting, total leisure time sitting) at Phase 5 (1997-99) and incident diabetes up to Phase 9 (20007-09).

Results: TV viewing time (Odds Ratios of highest time compared to the lowest time group: 1.50, 95%CI: 1.09, 2.06, overall trend $p=0.003$) and total sitting time (OR 1.42, 95% CI: 1.08, 1.87, $p=0.04$) showed dose-response associations with incident diabetes between Phases 5 and 9 independently of physical activity and other covariables. However, once BMI was taken into account, these associations attenuated towards the null with TV viewing (OR 1.40, 95% CI 1.01, 1.94, $p=0.08$) and total sitting time (OR 1.35, 95% CI 1.02, 1.78, $p=0.11$) retaining only borderline associations.

Conclusions: In this longitudinal study, total sitting and TV viewing time were associated with incident diabetes independently of physical activity but not independently of adiposity. Adiposity may be the main drive behind the links between sedentary behaviour and diabetes observed in previous cross-sectional studies.

P2.203

Sex differences and the built environment: Possible solution for the increasing levels of sedentary behaviour

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SIG: Yes, Policies and environments

Awards: No

Objective: Prolonged sitting has become a pervasive component of adults' lives. New evidence indicates that prolonged periods of inactivity, induced through sitting, have detrimental health effects. While recent cross-sectional evidence suggests a link between physical activity and built environment in adults, there is little research exploring the relationship between sedentary behavior and the built environment. We estimated the strength and shape of associations of GIS-determined walkability components of individual residential buffer zones with accelerometer-assessed sedentary time. We also explored whether these associations varied by gender, study site and type of day (weekday versus weekend).

Methods: The Understanding of the Relationship between the Built environment And Neighborhood (URBAN) study was conducted in forty-eight neighborhoods across four cities (Waitakere, North Shore, Christchurch, Wellington) in New Zealand between August 2008 and October 2010. Neighborhoods were stratified on GIS-based walkability measures. The outcome measure was average daily minutes of sedentary time estimated from the hourly accelerometer data from 1762 participants (aged 41.4 ± 12.1; 58% female). Participants wore an accelerometer for seven days. Sedentary time was operationalized as <100 accelerometer counts per minute. The exposure measures were GIS-based walkability components (dwelling density, street connectivity, land use mix and net retail floor area ratio) for residential buffers of 500 m and 1000 m radii. Data were analyzed using Generalized Additive Mixed Models in R.

Results: No significant main effects of GIS-based walkability were found on sedentary time. However, significant net retail floor area ratio by gender and street connectivity by study site interaction effects were observed. Retail floor area ratio was negatively associated with sedentary time in women. This effect was stronger and significant only for 500 m residential buffers. Among participants from Christchurch only, an increase of 1 decile in street connectivity was associated with a decrease of over 5 minutes of sedentary time per day. This effect was observed for both residential buffer sizes.

Conclusions: Neighborhoods with retail within close distance are associated with less sedentary time in female residents. The effects of street connectivity were location specific as a significant association was found for one city only.

P2.204

Objectively measured sedentary behaviour among white collar workers in a multi-ethnic Asian setting.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: Sedentary behaviour (SB) refers to activities of low energy expenditure (e.g., sitting) and large amounts of SB have been associated with adverse health outcomes independent of physical activity. The workplace has been identified as a potentially important area for reducing SB among working adults. However, little is known about patterns of SB among working adults in Asian settings. This study aimed to objectively assess SB in Singaporean white collar workers overall and according to day of the week.

Methods: A convenience sample of 125 employees of different faculties and departments at a large public University in Singapore was recruited. Participants wore an Actigraph wGT3X+BT for 7 full days, completed a short questionnaire capturing socio-demographics, SB and physical activity, as well as an accelerometer diary throughout the week. Participants who provided at least 4 valid wearing days (10 hours wear time during waking hours) were included in the analysis. Time spent in activities of different intensity (sedentary, light, moderate to vigorous) was determined based on widely used cut-offs.

Results: Among included participants, 122 met the wear time criteria. Participants were relatively young (median age: 32.5 years) and predominantly female (66.4%), of Chinese ethnicity (75.4%), and had a university degree (71.3%). Overall, they spent 70.8%, 25.3%, and 3.4% of their time in sedentary, light, and moderate to vigorous intensity activities, respectively. About 1/3 of total wearing time was accumulated in sedentary bouts of 20 minutes or more. Participants spent a greater proportion of the time in sedentary activities (71.4%) on weekdays as compared to weekend days (68.5%). At the same time, the proportion of their time spent in moderate to vigorous intensity activities was also greater during weekdays (3.9%) as compared to weekend days (2.2%).

Conclusion: Our findings highlight the substantial amount of time working adults in Singapore spent in SB. Considering the detrimental health effects of SB, which are independent from a lack of sufficient physical activity, our findings confirm the need to develop effective interventions to reduce sedentary behaviour at the workplace.

P2.205

Does general parenting influence parenting practices related to children's sedentary behavior?

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SIG: Yes, Children and families

Awards: No

Purpose: To examine associations between parenting behavior and practices related to 3-6 year old children's sedentary behaviors.

Methods: A cross-sectional study was conducted as a web-based questionnaire in Finland in autumn 2014. In total, 173 parents of 3-6 -year-old children completed the Comprehensive General Parenting Questionnaire including the five key constructs of general parenting: nurturance, structure, behavioral control, coercive control, and overprotection. Additionally, they reported parenting practices related to sedentary behaviors, allowing screen time for the child, carrying or pushing children in stroller, rewarding child when sitting still or punishing if too active, and practices that acts as barriers for children being physically active. The mean age of the participants was 36 years and 75 percent of them had completed at least a bachelor's degree. Spearman correlations were used to study the associations between parenting behavior and parenting practices related to children's sedentary behavior.

Results: Parental structure was correlated with less often allowing screen time for the child, carrying or pushing the child in stroller, rewarding child when sitting still or punishing if too active, and having practices that act as barriers for children being physically active. Parental nurturance was correlated with less often rewarding child when sitting still or punishing if too active, and having practices that act as barriers for children being physically active. Behavioral control was associated with more often allowing screen time for the child. Coercive control was associated with more often allowing screen time for the child and rewarding child when sitting still or punishing if too active. Overprotection was correlated with more often having practices that act as barriers for children being physical active.

Conclusions: Our findings suggest that positive parenting behavior i.e. more structure and nurturance and less overprotection and coercive control is related to practices that prevent children from being sedentary. Parents should be encouraged to apply more positive parenting practices, which could prevent children from being sedentary.

P2.207

Patterns and sustainability of sit-stand workstation use in a typical office workplace-Protocol for a randomized controlled trial.

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SIG: Yes, Policies and environments

Awards: No

Objective:

Evidence suggests sedentary behaviour (SB) is linked to multiple poor health outcomes, independent of physical activity level (Thorp et al., 2011). Office workers spend up to 75% of working day sedentary, often in prolonged periods extending 30 minutes (Evans et al., 2012, Neuhaus et al., 2014). Using sit-stand workstations has been shown acceptable and feasible by office workers (Chau et al., 2014) and contributes to reductions in sitting short term (Alkhaja et al., 2012, Neuhaus et al., 2014). However the long term effectiveness and sustainability of sit-stand workstation use as well as any potential 'novelty effect' in new users has not been described. In addition there is little information on patterns of desk use and interruptions to sitting which may be more important for health outcomes (Chinapaw et al., 2014).

Sit-stand workstations use has been determined by self-report diary, and their effectiveness attributed to the objectively measured SB of the desk user. Self-report of desk use is subject to social desirability and recall bias and objective measurement of SB among desk users assumes reductions in sitting are a result of sit-stand workstation use. Objective monitoring of desk height/movement married to objectively measured SB in users may overcome this methodological problem.

Method:

The proposed RCT will examine effects of providing a sit-stand workstation on SB in office workers over 12-month period. 40 office-based university staff aged 18-65 years will be randomized into a control group (SB in usual environment) or intervention group (SB and sit-stand workstation). Sedentary behaviour will be objectively measured using an accelerometer (activPAL, PAL Technologies Ltd, Glasgow, UK) worn for 7 days pre-intervention and at 2 weeks, 2, 5, 8 & 12 months following desk installation. Desk height/movement/usage will be monitored objectively throughout the 12-month period using Java Sun Spot wireless sensor network which will be attached to the top shelf of the desk. Participants will complete self-report workstation use but will be blinded to the objective measure of its use.

Results:

Findings of the study will provide useful information on pattern and sustainability of sit-stand desk use and inform interventions to reduce SB in the workplace.

P2.208

An Action-Planning Intervention Can Reduce Workplace Sitting Time: A Pilot Study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Several interventions have decreased occupational sitting time through environmental modifications (e.g., sit-stand workstations), but few have attempted to intervene at the individual-level using a social cognitive approach. This study examined whether an action-planning intervention based on the Health Action and Process Approach (Schwarzer et al., 2003) can decrease sitting time among office employees.

Methods: A one-arm, prospective pilot study was conducted to test the effectiveness of a four-week action-planning intervention consisting of tips to decrease sitting time (walk more, stand more) and a schedule of minimally disruptive light exercises and stretches. Participants were 33 office employees (79% female; $M_{\text{age}} = 37.00$, $SD = 11.39$; $M_{\text{BMI}} = 24.79$, $SD = 4.57$). Action-planning was measured using an implementation intention questionnaire (Gollwitzer, 1999). Workplace sitting, stretching, number of breaks, walking, and standing were measured using a modified Occupational Sitting and Physical Activity Questionnaire (Chau et al., 2012). All variables were assessed at baseline, post-intervention, and four-week follow-up. Thirty-one (94%) and nineteen (58%) participants provided post-intervention and follow-up data, respectively. Data were analyzed using an intent-to-treat last observation carried forward approach. The level of significance was set at $p < .05$.

Results: Implementation intentions significantly improved ($\eta^2 = 0.53$) from baseline to post-intervention. Workplace sitting time significantly decreased from baseline to post-intervention ($M_{\text{change}} = -28.22$ min/workday, $SD = 61.76$; $\eta^2 = 0.18$). There was a non-significant increase in sitting time (+7.43 min/workday, $SD = 27.44$; $\eta^2 = 0.07$) from post-intervention to follow-up. Significant increases from baseline to post-intervention were observed for stretching (+10.00 min/workday, $SD = 12.80$; $\eta^2 = 0.39$), number of breaks (+0.47, $SD = 1.13$; $\eta^2 = 0.15$), and walking (+8.63 min/workday, $SD = 16.41$; $\eta^2 = 0.25$), but not standing (-0.16 min/workday, $SD = 17.63$; $\eta^2 = 0.01$). Significant decreases from post-intervention to follow-up emerged for walking (-4.50 min/workday, $SD = 11.46$; $\eta^2 = 0.14$) and number of breaks (-0.31, $SD = 0.78$; $\eta^2 = 0.14$), whereas a significant increase was found for standing (+7.14 min/workday, $SD = 19.47$; $\eta^2 = 0.12$). No significant changes emerged for stretching (-2.46 min/workday, $SD = 10.17$; $\eta^2 = 0.06$).

Conclusions: An action-planning intervention can decrease occupational sitting time through increases in stretching, number of breaks, and walking. Post-intervention maintenance of sitting time remains a challenge.

P2.209

Screen-viewing and sleep duration in children up to the age of two years - a cross-sectional study in a multi-ethnic Asian population.

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SIG: Yes, Early care and education

Awards: No

Purpose:

Regular TV viewing has been associated with various detrimental health effects in children. However, little is known about the impact of device specific screen-viewing in very young children. Our study examined foreground screen-viewing in Singaporean children up to the age of two and its association with sleep duration.

Methods:

A cross-sectional study among parents of children up to the age of two years visiting two major developmental assessment or vaccination clinics in February 2014 was conducted. Trained interviewers administered standardized questionnaires to parents, assessing device specific screen-time exposure, sleep duration and socio-demographic characteristics of their children. Multiple linear regression analysis was conducted to investigate associations between screen-viewing and sleep duration while adjusting for relevant confounding factors.

Results:

Among 794 eligible parents, 699 participated and provided complete data for relevant variables (88.0%). The median age of children was 7 months (IQR: 4-14). Prevalence of daily foreground screen viewing was 52.8%, and increased steeply with age (0-6 months: 27.9%, 7-12 months: 62.6%, 13-24 months: 80.3%). Duration of television viewing was highest with a median of 30 minutes (IQR 14.6-87.9 minutes) per day followed by portable devices, such as smart phones and tablets, with a median of 10 minutes (IQR 0-45 minutes). Computer and other devices were rarely used and are therefore not reported separately. Overall, a one minute increase in a child's screen time was associated with a decrease in sleep time by 0.25 minutes (95% CI: 0.11 to -0.39). Associations were consistent across device types (portable devices: -.34, 95% CI: -0.60 to -.09; TV: -.28, 95% CI: -0.50 to -.06).

Conclusion:

Screen viewing in Singaporean children up to the age of two years is common and increases steeply with age. Screen viewing was strongly associated with shorter sleep duration. Our findings could have important public health implications and warrant further investigation. Public health interventions to reduce screen-viewing behaviour in children might have to start as early as in infancy.

P2.210

Correlates of accelerometer-determined patterns of sedentary behaviors in working adults: a cross sectional analysis

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Although prolonged sitting has been recognized as an occupational health risk, studies on correlates of patterns of sedentary behavior are limited. Accelerometers allows for capturing the time patterns of sedentary behaviors. We used accelerometer data to examine correlates of patterns of sedentary behavior in a Japanese working adult population.

Methods: In total, 823 Japanese adult full-time workers from two enterprises were enrolled. Sedentary behavior was assessed using a tri-axial accelerometer device (Active Style Pro, Omron Healthcare, Co. Ltd.) for 10 consecutive days. Duration and number of breaks in sedentary behavior were calculated separately for weekdays and weekend-days. Forced entry linear regression analyses were used to examine associations of socio-demographic (age, gender, education, and marital status), occupational (work hours, shift-work, employment, and occupation), behavioral (smoking, drinking, and moderate-to-vigorous physical activity), health-related (obesity, and dietary and sleep habit), and psychological indicators (depression and occupational stress) with patterns of sedentary behavior.

Results: The final sample consisted of 706 men and women with valid accelerometer records. Mean duration of sedentary time were 546 mins/day with 9 breaks per sedentary hour on weekdays, and 479 mins/day with 10 breaks per sedentary hour on weekend-days. Individuals who were older, regular employees, shift-workers, sales, less educated, physically inactive, and those who ate less were more likely to spend longer sedentary time with fewer sedentary breaks on weekdays. On weekend-days, effects of occupational factors on sedentary time were attenuated compared with on weekdays. Those who were married and exposed to high-strain jobs spent shorter sedentary time with a greater number of breaks on weekend-days. In further analyses, longer bouts (5 min or 10 min) of sedentary time were used and those significant associations were little changed.

Conclusions: The influence of socio-demographic and occupational factors on sedentary time and number of breaking up sedentary behavior among Japanese adult workers differed between weekdays and weekend days, suggesting that interventions aiming to reduce sedentary behaviors may need to consider the day of the week. Further longitudinal studies are needed to address causal relationship between these variables and patterns of sedentary behavior.

P2.211

What makes sedentary behaviour newsworthy as a health issue? A content analysis of coverage of sedentary behaviour in Australian newspapers 2000-2012

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Sedentary behaviour has a growing profile as a risk factor for chronic disease. This study aimed to compare volume of print news media coverage of sedentary behaviour with that in the academic literature, and to analyse news content to identify the newsworthy aspects of sedentary behaviour as a health issue.

Methods: We searched PubMed and Factiva databases for scientific and newspaper articles about sedentary behaviour published 2000-2012. Two researchers independently rated the newspaper articles for relevance and analysed news angles, population represented, sitting contexts, health outcomes, who is portrayed as responsible for the problem of prolonged sitting and its solutions, solutions to prolonged sitting, and the role of physical activity.

Results/findings: Between 2000-2012, 570 scientific articles and 48 newspaper articles were found. Most newspaper articles covered sedentary behaviour as a new development in health research. Of 48 newspaper articles, 77% reported prolonged sitting was linked to negative health effects; 34% focused on workplace sitting; individuals were most often identified as responsible for the problem of prolonged sitting (62%) and its solutions (65%), followed by the environment. In 36 of 48 newspaper articles, there were 39 mentions of physical activity: 21% reported sitting as harmful to health even if physically active; 15% reported prolonged sitting is harmful to health no matter how much physical activity one does.

Conclusions: Sedentary behaviour stories depended on new research for newsworthiness; sitting at work was the most newsworthy aspect. Recommendations for future communications include discussing non-work sitting contexts, and highlighting the benefits of physical activity without minimising its contribution to health.

P2.212

Patterns of prolonged, uninterrupted sedentary behavior in U.S. middle-aged and older adults

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: The purpose of this study was to examine patterns of sedentary behavior in a national cohort of U.S. middle-aged and older adults and determine factors that may influence prolonged sedentary behavior.

Methods: We studied 8,096 participants from the REasons for Geographic and Racial Differences in Stroke (REGARDS) Study, a population-based study of black and white adults ≥ 45 years from across the contiguous U.S. Seven-day accelerometry was conducted using an Actical™ accelerometer fitted to the participants' right hip. Analyses were restricted to participants with ≥ 4 compliant days (i.e., ≥ 600 min/day) of accelerometer wear. Sedentary bouts were defined as consecutive minutes wherein the accelerometer registered < 50 counts/min. Prolonged sedentary behavior was defined as accumulating $\geq 50\%$ of total sedentary time in bouts ≥ 30 min.

Results: Total sedentary time was 670.2 ± 123.9 min/day. Mean sedentary bout length was 11.4 ± 8.1 min. The total number of sedentary bouts ≥ 20 , ≥ 30 , ≥ 40 , ≥ 60 , and ≥ 90 min were 8.8 ± 2.3 , 5.5 ± 1.9 , 3.8 ± 1.6 , 1.9 ± 1.1 , and 0.8 ± 0.7 bouts/day, respectively. Approximately 80% and 31% of participants engaged in ≥ 1 daily sedentary bout ≥ 60 and ≥ 90 min, respectively. Daily sedentary bouts ≥ 20 , ≥ 30 , ≥ 40 , ≥ 60 , and ≥ 90 min accounted for $60.0 \pm 13.9\%$, $48.0 \pm 15.5\%$, $39.1 \pm 16.0\%$, $26.0 \pm 15.4\%$, and $14.2 \pm 12.9\%$ of total daily sedentary time, respectively. Several factors were associated with prolonged sedentary behavior in multivariate adjusted models (Odds Ratio [95% CI]): older age (65-74 years: 1.99 [1.55-2.57]; ≥ 75 years: 4.68 [3.61-6.07] vs. 45-54 years), male gender (1.41 [1.28-1.56] vs. female gender), residence in non-stroke belt/buckle region of U.S. (1.16 [1.05-1.30] vs. stroke belt region), body mass index (overweight: 1.33 [1.18-1.51]; obese: 2.15 [1.89-2.44] vs. normal weight), and winter season (1.18 [1.03-1.35] vs. summer).

Conclusions: U.S. middle-aged and older adults accumulate a large proportion of total sedentary time in prolonged, uninterrupted bouts of sedentary behavior as almost one-half of total sedentary time was accumulated in sedentary bouts ≥ 30 min. Several factors, including older age, male gender, residence in non-stroke belt/buckle region, overweightness/obesity, and winter time, were associated with patterns of prolonged sedentary behavior.

P2.213

The correlates of after-school sedentary behavior among children aged 5-18 years: a systematic review.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Children and adolescents spend a large proportion of the after-school period in sedentary behavior (SB), despite the associated negative health outcomes. An understanding of the correlates of after-school SB would assist the development of intervention strategies targeting behavior change. However, such correlates are not well understood. This review aimed to synthesise evidence of the correlates of children's and adolescents' after-school SB.

Methods: A computerised literature search was performed for peer-reviewed original research journal articles published in English before December 2014. Inclusion criteria were: 1) sample aged 5-18 years; 2) quantified the amount of SB or component of this that children performed after school (i.e. TV viewing, computer/DVD/video games, screen based SB, non-screen based SB, and homework/academics); 3) included a measure of SB as the dependent outcome; and 4) assessed the association between correlates and SB. No restriction was placed on the definition of the after-school period. However, studies were excluded if they examined SB 'outside of school' or included special populations.

Results/findings: Data for children and adolescents were synthesised separately. Twenty-nine studies were included: 19 studies among children, 6 among adolescents, 1 among both children and adolescents, and 3 had a combined sample of children and adolescents. Findings were also separated by the after-school location i.e. after-school care (n=4 studies, all among children) and unidentified locations (n=25). Four or more studies investigating a correlate were required to determine an overall association. Only three (sex, age and BMI) of the potential 66 correlates identified had sufficient evidence to draw overall conclusions and these were all among children at unidentified locations. There was an inconsistent association between sex (male) and SB, a null association with TV viewing and a positive association with computer/DVD/video game use. There were positive associations between age and SB, age and TV viewing and a null association between BMI and TV viewing.

Conclusions: Overall associations were only able to be made for three correlates of after-school SB and the direction of these varied depending on the SB of interest. More evidence of the demographic/biological, social and physical environment correlates of after-school SB and its components is needed.

P2.214

Associations between objectively measured daily sitting time and cardio metabolic biomarkers in a community-based sample of sedentary men and women

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Prolonged daily sitting time has been identified as a possible risk factor for cardio metabolic morbidity and mortality. Detailed knowledge on objectively measured sitting time and cardiometabolic biomarker is necessary to inform possible public health action against sedentary behavior.

The aim of the present study was to explore the association between objectively measured daily sitting time and anthropometric measures and cardiometabolic biomarkers in a community-based sample of sedentary adults.

Methods:

A total of 163 men and women from the baseline examination of a randomized controlled trial, "Sedentary Intervention Trial", were included in the present cross sectional study. Sitting time was measured by 7-days ActivPAL® accelerometer. Associations between number of hours of sitting time per day time and BMI, waist circumference, total cholesterol, HDL, LDL, triglycerides, glucose and insulin were explored by linear regression analyses with stepwise adjustment for sex, age, smoking, self-rated dietary quality, leisure time physical activity, ActivPAL® wear-time and for some outcomes, waist circumference.

Results:

Mean age in the population was 52 ± 14 years, 56% were women, 26% were daily smokers and 53% were working. Mean daily sitting time was 9.51 ± 1.9 h/day, standing time was 4.13 ± 1.2 h/day, stepping time was 1.76 ± 0.7 h/day and participants had 60 ± 18 breaks in sitting time per day. Median self-reported moderate-to-vigorous physical activity (MVPA) was 4.0 h/week (interquartile range 2.0-7.0). Daily sitting time was positively and significantly associated with waist circumference ($\beta = 1.69$ (95% CI 0.44;2.94), $p = 0.008$) and BMI ($\beta = 0.67$ (95% CI 0.17;1.18), $p = 0.01$) in adjusted models, and inversely associated with HDL after additional adjustment for waist circumference ($\beta = -0.05$ (95% CI -0.10;-0.01), $p = 0.02$). The association with insulin became insignificant after adjustment for waist circumference ($\beta = 2.40$ (95% CI -0.65;5.44), $p = 0.12$). No significant associations were seen for total cholesterol, LDL, triglyceride or glucose.

Conclusions:

Long hours of objectively measured daily sitting time were significantly associated with high waist circumference and BMI, and with low HDL in a community-based sample of sedentary men and women. Findings confirm the existence of a possible link between sedentary behavior and deleterious cardiometabolic health and support the need for public health action against sedentary behavior.

P2.215

Prevalence and correlates of sitting in the 28 EU member states: a Eurobarometer study

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Sedentary behaviour is increasingly recognized as an important health risk, but comparable sitting data across European countries are scarce. This study explores the prevalence and correlates of self-reported sitting in the 28 European Union (EU) member states.

Methods:

This study reports data from the Special Eurobarometer 412 "Sport and Physical Activity". In November and December 2013, 27,919 Europeans (approximately 1000 per EU member state) were interviewed face-to-face. Sitting time on a usual day was assessed using the IPAQ question and dichotomised into sitting less- and more than 7.5 hours per day. Uni- and multivariate odds of sitting more than 7.5 hours per day were assessed by country, gender, age, marital status, age when stopped full-time education, occupation, type of community, number of children in the household, television-, computer-, and car ownership, internet use frequency, difficulties paying bills and life satisfaction using logistic regression.

Results:

18.5 percent of European adults reported sitting 7.5 hours or more per day, ranging from 32.1 percent in the Netherlands to 8.9 percent in Spain. The odds of sitting more than 7.5 hours per day were highest in the Netherlands (OR 1.74 (95% CI 1.42-2.14) and Denmark (1.71 (1.38-2.10) and lowest in Portugal (0.44 (0.33-0.57) and Italy (0.42 (0.32-0.55) in the multivariate model. In addition, the multivariate model showed that women, people living in rural areas, people with three or more children and car owners had significant lower odds of sitting, while several occupation categories (self-employed, manager, white collar, unemployed, retired and student), daily internet use frequency and being fairly, not very or not at all satisfied with life showed significant higher odds.

Conclusions:

There is great variation in the prevalence of sedentary behaviour in Europe, both across countries and sociodemographic groups. These results provide a starting point for additional research and intervention development, especially aimed at high-sitting populations.

P2.216

Demographic differences in breaks and bouts of sitting time among young children in childcare Demographic differences in breaks and bouts of sitting time among young children in childcare

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SIG: Yes, Early care and education

Awards: No

Objective: Young children spend almost half of their time at childcare sitting. Sitting for prolonged periods is associated with adverse health outcomes. The purpose of this study was to report the amount of breaks and bouts of sitting time among children aged 1 to 5 years during childcare, and to examine if this varies by sex, age, weight status, and socio-economic status (SES).

Methods: Cross-sectional data from 301 children (48% boys; mean age=3.7±1.0 years) across 11 childcare services within the Illawarra Region (New South Wales, Australia) were used. Sitting, standing and stepping time during childcare were objectively assessed using an activPAL accelerometer over 1-5 days. Sitting breaks and bouts were determined from activPAL outputs. Mean breaks and bouts/hour of sitting were calculated and bouts were categorised as: <1min, 1-4min, 5-10min, 11-20min, 20-29min, or >30min. Height and weight were assessed, and body mass index calculated. Differences in breaks and bouts between boys and girls; toddlers (1-2 year) and pre-schoolers (3-5 year); underweight, normal weight, overweight and obese; and low and medium SES groups were examined using a linear regression and repeated measures ANOVA. All analyses adjusted for clustering within childcare service.

Results: Children spent 48.4% of time at childcare sitting, 32.5% standing, and 19.1% stepping. On average, children accumulated 58 breaks/day (mean breaks/hour=11.6±2.9). Breaks/hour did not differ by demographic characteristics. The average number of <1 min bouts/hour differed significantly between boys and girls (6.2 vs. 5.8; $p=0.001$), toddlers and pre-schoolers (6.3 vs. 5.8; $p=0.001$), low and middle SES (0.9 vs. 0.4; $p<0.05$), obese and normal weight (6.0 vs 5.4; $p=0.003$), normal weight and underweight (5.9 vs 5.4; $p=0.03$), obese and underweight (6.6 vs. 5.4; $p=0.03$) and overweight and underweight children (6.6 vs. 5.4; $p=0.02$). The number of bouts ≥30min was significantly greater in pre-schoolers compared to toddlers (0.4 vs. 0.1; $p=0.019$). The number of 1-4min, 5-10min, 11-20min, 20-29min bouts did not differ by demographic characteristics.

Conclusions: In young children, shorter bouts of sitting are more common and differ between socio-demographic factors in young children. Strategies to break up the child's sitting time with more standing and LPA are warranted.

P2.217

Relationships between Screen-Based Sedentary Behavior and Functional Strength Measures in 6-15 year-old US Children

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Increased television viewing has previously been associated with poor diet quality and increased BMI, but little is known about how this impacts strength in children. The current study aims to determine the associations between different types of screen-based sedentary behaviors and measures of functional strength in children.

Methods:

Data from the NHANES National Youth Fitness Survey (NNYFS) from children ages 6-15 were analyzed in this study. Regression models were conducted to determine if screen-based sedentary behaviors (television viewing time, video/computer game time) are associated with strength measures (grip, leg extensions, modified pull-ups, plank) while controlling for potential confounders including child age, sex, BMI z-score, and days/week with 60+ minutes of physical activity. Grip strength and leg extensions divided by body weight were analyzed to provide measures of functional strength together with pull-ups and plank, which require lifting the body.

Results:

The results from the full sample show that television time was a significant factor in explaining grip strength ($p<0.01$), plank time ($p>0.001$), and pull-ups ($p<0.01$), and approached significance for leg extensions ($p=0.073$), with increased television time associated with decreases in all strength measures. In contrast, computer/video game time was not significantly associated with any strength measures. Stratified analyses by age group show that television time was significantly associated with plank and pull-ups in 6-9 year-olds; grip strength, leg extensions, and plank in 10-12 year-olds; and plank in 13-15 year-olds.

Conclusions:

These results show that television time is negatively associated with children's functional strength while controlling for age, gender, BMI, and physical activity. In contrast, time spent playing computer/video games was not related to strength, suggesting that "screen time" may not be a single construct and different types of sedentary behaviors should be considered separately. This is consistent with studies showing that television viewing, but not reading or computer use, is associated with higher risks of overweight (Sisson et al., 2011). These findings indicate that further exploration of the potential benefits of reducing television time on children's strength and related mobility is needed.

P2.218

Characterizing the context of sedentary lifestyles in a representative sample of adults: The Physical Activity Measurement Survey (PAMS) project

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Background: Excessive time spent on sedentary behavior (SB) is known to have detrimental effects on health. The lack of information on the context of SB prevents a detailed understanding of the underlying nature of SB.

Purpose: The purposes of this study were to explore the most frequently occurring sedentary activities and to characterize the purpose and location information of SB by socio-demographic indicators in a representative sample of adults.

Methods: A representative sample of 1,442 adults (20-71yrs) from four Iowa counties completed a 24-hour Physical Activity Recall assessment to provide detailed information about time, types, purpose and location of activities performed in the previous day. Reported activities were matched with corresponding MET scores based on the Compendium of Physical Activity. Descriptive analyses were used to summarize the context of the predominant SB (defined as any activities with assigned MET scores ≤ 1.5).

Results: The average reported sedentary time was 7.7 hours per day. Sitting was the most frequently occurring form of SB, given that 15 of the 20 reported sedentary activities involved a form of 'sitting' in the definition. In regards to the 5 purpose categories, time allocations were 30.0% for Work, 22.4% for Home/Family, 26.9% for Leisure, 5.7% for Exercise/Sports and 15.2% for Other. For the location categories, the overall time allocations were 27.5% for Work, 20.5% for Home/Indoor, 15.8% for Home/Outdoor, 11.3% for Transportation, and 24.8 for Community. Individuals with varying levels of socio-demographic indicators exhibited differential patterns of purpose and location of SB.

Conclusion: The findings clearly suggest that the appreciation of the specific context is critical for understanding the complex behavioral aspects of SB at the population level. This study can serve as a fundamental framework for designing and implementing future intervention studies aimed at reducing sedentary time.

P2.219

Post-intervention changes in sedentary behaviours of adolescent girls from the "Healthy Habits, Healthy Girls - Brazil" (H3Girls Brazil) school-based intervention

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Evaluate post-intervention differences in sedentary behaviours of adolescent girls from the H3Girls Brazil program".

Methods: H3Girls Brazil is an adaptation from the Australian NEAT Girls randomised control trial with low-income adolescent girls. The program was conducted in 10 public high schools located in different low-income areas of the city of São Paulo, Brazil. It was a 6-month multi-component, school-based intervention informed by the social cognitive theory, with the participation of 242 adolescent girls (mean age of 15.62 ± 0.88 years). The intervention included enhanced Physical Education classes, school break-time physical activity sessions, interactive seminars, Nutrition and Physical Activity (PA) handbooks, Nutrition workshops, PA and food diaries, parents newsletters and text messages to encourage healthy eating, PA and reduce sedentary behaviours. Sedentary behaviours were assessed through specific behaviours (TV and computer time) and sum of the total daily time of sedentary behaviours during weekdays and weekends. Descriptive statistics and linear mixed models adjusted for school level were used with alpha level set at $p \leq 0.05$. All the analysis followed the intention to treat principle.

Results: Girls in the intervention group reported significantly less TV time on the weekdays (adjusted mean, -0.40hours/day; 95% CI, -0.62 to -0.19, $p=0.00$), TV time on the weekends (adjusted mean, -0.48hours/day; 95%CI, -0.76 to -0.21, $p=0.00$), total screen-time on the weekdays (adjusted mean, -0.58/hours/day; 95%CI, -0.99 to -0.16, $p=0.00$) and total screen-time on the weekends (adjusted mean, -0.94; 95%CI, -1.36 to -0.53, $p=0.00$) than girls in the control group. Other measures did not reach statistical significance (computers during weekdays and weekends).

Conclusion: Girls from the intervention group followed the recommendations of sedentary behaviours reduction on the protocol of the H3Girls Brazil program of less than two hours per day on screen-activities. The school-based program can inform the development of future interventions among youth living in low-income communities of developing countries.

P2.220

Marriage and Weight Loss Surgery: A Narrative Review of Patient and Spousal Outcomes

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: The purpose is to review and synthesize the research on marriage and weight-loss surgery (WLS), and provide future, systemic research recommendations on intimate relationships of WLS patients.

Methods: A review was conducted to identify the associations between WLS outcomes and marriage/spouses using research-based search engines. Key terms included: bariatric surgery, couples, gastric bypass, WLS, romantic, intimate, and marriage. Criteria for inclusion was: 1) peer reviewed articles, 2) contained empirical data, 3) published in English between 1990 - 2014, 4) investigated WLS, 5) participants were ≥18, and 6) examined relationship outcomes. Each search produced an average of 23 articles, save for Google Scholar, which had 16,100. The final sample included 13 articles.

Results: The articles were classified into two themes: 1. Marriage's impact on weight loss post-WLS (n = 6), and 2. The impact of WLS on marriage and spouses (n = 8). Some articles fit in both themes. Within Theme 1, a negative relationship between marriage and weight lost post-WLS was found (n = 4), where married patients lost less weight than non-married peers. Two articles found no association between marriage and WLS outcomes. Within Theme 2, three subthemes emerged: relationship quality, sexuality, and psychological outcomes. Relationship quality described a negative association in relationship quality post-WLS for patients and spouses (n = 2), and mixed results of relationship quality (n = 2). Sexuality described increases in sexual satisfaction and attraction (n = 3). Psychological outcomes described perceived changes in patients' and spouses' personalities (n = 2) and that marital status predicted better mental health for patients post-WLS (n = 1).

Conclusions: Based on this review, married patients were less successful at losing weight and experienced negative relationship outcomes post-WLS. However, these results are preliminary due to the lack of research in this area. Future research needs to investigate the multiple ways that WLS effects patients' relationships and behaviors as well as understand the reciprocal influences of spouses' behaviors on one another and their relationship processes. Areas for intervention can be identified to integrate the spouse into the treatment plan to mitigate the negative influences on patients' health and relationships.

P2.221

WHAT IS THE IMPACT OF A COMMUNITY PHARMACY-LED WEIGHT MANAGEMENT SERVICE FOR ADULTS IN STOCKTON-ON-TEES, UK? A MIXED METHODS SERVICE EVALUATION

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Several studies have demonstrated the effectiveness of community pharmacy-led weight management interventions. However, a recent systematic review¹ was not able to make a judgement about the efficacy of these interventions because the evidence base was limited, or of poor quality, or both. The aim of this study was to evaluate a 12-week community pharmacy-led weight management service in a deprived area of Stockton-on-Tees, UK.

Methods:

The service was delivered by pharmacists and pharmacy technicians in eight community pharmacies over a 12 week period, targeting overweight adults. Quantitative data included participants' weight, height, waist circumference, and wellbeing². One-to-one, face-to-face interviews were conducted post-intervention with three pharmacists, two technicians and 11 service users (7 completers and 4 dropouts). Interviews were transcribed verbatim, anonymised and analysed using Burnard's systematic thematic content analysis³. Change in weight, waist circumference, BMI, and wellbeing scores, were assessed.

Results:

58 participants were recruited, of which 11 completed the 12-week programme. Overall, a significant reduction in weight, waist circumference and BMI, and a significant improvement in wellbeing scores, were found. Analysis of interview data revealed the pharmacy was deemed to be a convenient and easily accessible setting. Service users were at ease receiving weight management advice in this setting, particularly praising the one-to-one personalised delivery approach. The service appeared to be equally effective when delivered by pharmacy technicians and pharmacists, which could prove useful in future delivery and practice in terms of freeing up pharmacists' time and making best use of resources. The service had knock-on effects of improved dietary habits for family and friends. Non-completers were complimentary of the service and the delivery, and continued to make lifestyle changes and lost weight.

Conclusions:

The feasibility and impact of the service appears promising, and a useful option to the range of weight management services commissioned by local health authorities and councils. Further evaluation to assess whether the service has the potential to be offered effectively as a brief intervention is planned.

1 Gordon 2011. Obesity Reviews; 12: 897-911.

2 Tennant 2007. Health & Quality of Life Outcomes; 5:63

3 Burnard 2008. British Dental Journal; 204: 429e32.

P2.222

Predictors, sources and patterns of gestational weight gain information seeking among pregnant women

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Promoting healthy gestational weight gain (GWG) is important for preventing obstetric and perinatal morbidity, along with obesity in both mother and child. Provision of GWG guidelines by health professionals predicts women meeting GWG guidelines. Research concerning women's GWG information sources is limited. This study assessed how, where and which pregnant women seek information regarding GWG.

Methods: Utilising a cross sectional design, 1046 consecutive women received a mailed questionnaire after their first antenatal visit to a public maternity hospital in Melbourne, Australia. Recalled provision of GWG guidelines by doctors and midwives, recalled provided GWG goals, and the obtaining of GWG information and information sources were assessed. Logistic regression was used to investigate the predictors of GWG information seeking and GWG sources used.

Results/findings: Participants (n=368; 35.2% response) averaged 32.5 years of age and 20.8 weeks gestation, with 33.7% speaking a language other than English. One in ten women recalled receiving GWG guidelines from doctors or midwives, of which half were consistent with Institute of Medicine guidelines. More than half the women (55.4%) had actively sought GWG information. Nulliparous (OR 7.07, 95% CI=3.91-12.81) and obese (OR 1.96, 95% CI=1.05-3.65) women were more likely to seek information. Underweight (OR 0.29, 95% CI=0.09-0.97) women and those working part time (OR 0.52, 95% CI=0.28-0.97) were less likely to seek information. Most frequently reported GWG sources included the internet (81.6%), books (54.6%) and friends (51.2%). The single most important sources were identified as the internet (33.3%), general practitioners (15.9%) and books (14.5%). Women born in a country other than Australia were three times more likely than those born in Australia to view media sources as the most important GWG information source (OR 3.20, 95% CI=0.07-1.57).

Conclusions: The dominance of non-clinical information sources reinforces that an important opportunity to provide reputable advice and guidance is currently being missed.

P2.223

Unveiling the reality of adolescent peer cultures: Impact on body image perception

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective:

Body image has been identified as an issue of concern for young people in many countries. Given that body dissatisfaction is one of the most robust risk factors for eating disorders, this issue warrants immediate attention. Sociocultural models of body image and eating disorders highlight the role of parents, peers and the media in the development and maintenance of body image problems; however research connecting peer influences and adolescent body image concerns is sparse. Adolescence is a period when individuals spend an increasing amount of time with peers, and it is therefore characterized by an increased striving for acceptance by and popularity with, the peer group. Furthermore, concerns over how one's body is perceived by peers preoccupy the minds of a majority of adolescents. Peers thus have a major impact in shaping adolescents' thoughts about their bodies yet no research has examined how peers influence body image perceptions. Therefore the purpose of the current study was to explore peer influences on adolescent body image from young peoples' perspectives.

Method:

This study used a qualitative research design. Seventeen focus groups were conducted with adolescents (n=111) aged 13-17 years from six post-primary schools in the Republic of Ireland. The questions used to guide the focus groups were developed based on a review of the literature. The focus groups were audio recorded and transcribed verbatim. Thematic analysis was used to analyse the data collected.

Results:

Eight main themes emerged from the analysis including: (1) Peer Modelling (2) Pressure to Conform (3) Peer Comparison (4) Peer Surveillance (5) Failure to conform (6) Consequences (7) Positive peer influences (8) Age and Gender differences. The themes constructed provide a thorough insight into how peers influence body image perceptions (both positively and negatively) among young people in Ireland.

Conclusion:

Results from this study unveil an in-depth understanding of the mechanisms through which peers influence body image perceptions among youth in Ireland. Interventions to improve body image need to consider the contribution of peers in the aetiology of body dissatisfaction among adolescents.

P2.224

Parent/carer perception of their child's body size and child weight status in a multi-ethnic sample: a cross-sectional study

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SIG: Yes, Children and families

Awards: No

Objective: Childhood obesity is a growing problem worldwide. Accurate parental perception of their child's body size is important for them to be able to correctly recognise when action needs to be taken to support their child in achieving a healthy weight. This study aims to investigate the relationship between parental perception of and dissatisfaction with their child's body size, and their child's objectively measured weight status in a multi-ethnic sample of UK primary school-aged children.

Methods: To assess perception and dissatisfaction in relation to their child's body size, parents/carers of 866 children aged 5 - 6 (51% boys) were asked to identify on a figure rating scale (1=thinnest, 7=fattest) their perception of their child's actual and ideal body size. Dissatisfaction scores were calculated by subtracting the ideal from the actual body size rating. Height and weight were measured by trained researchers and BMI z-scores were calculated using the UK 1990 BMI growth reference charts. Multivariate linear regression was used to examine the relationship between parent/carer perceived body size and dissatisfaction, and child weight status.

Results: Parent/carer perceptions of their child's body size were positively associated with their child's objectively measured weight status (overweight/obese vs. not overweight/obese, $\beta=1.42$ (95% CI 1.25-1.60), $p<0.001$) and BMI z-score ($\beta=0.62$ (95% CI 0.57-0.67), $p<0.001$), adjusting for sex, deprivation and ethnicity. Parent/carer body dissatisfaction scores for their child were also positively associated with their weight status (for overweight/obese vs. not overweight/obese, $\beta=1.26$ (95% CI 1.10-1.42), $p<0.001$) and BMI z-score ($\beta=0.55$ (95% CI 0.50-0.60), $p<0.001$).

Conclusions: The findings indicate that parents with overweight/obese children are more likely to identify their children as bigger and are more likely to want them to be thinner. Previous literature suggests that parents often underestimate the weight status and body size of their children. Evidence from the present study suggests that recognition of overweight in children and perceptions of this as a problem may be changing. This has positive implications for family-based childhood obesity interventions.

P2.225

What Does *Healthy* Mean? Is BMI Status Associated with Health Perceptions among 8-12 year olds?

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Objective: The Canadian Assessment of Physical Literacy (CAPL), as developed by a group of researchers at the Children's Hospital of Eastern Ontario (CHEO), is the first comprehensive protocol that assesses physical literacy in children 8-12 years of age. Several domains including daily behaviour, motivation and confidence, knowledge and understanding, and physical competence are assessed. The purpose of this study was to determine children's knowledge and understanding of health, specifically if what a child thinks *Healthy* means is associated with Body Mass Index (BMI).

Methods: A paper-based questionnaire was administered to 204 children aged 8-12 years in southwestern Ontario, Canada. Specifically, children were asked draw a line to as many items they thought *Healthy means*, options included: *Eating Well*, *Feeling Good*, *Not Being Sick*, *Being Skinny*, and *Looking Good*, with the latter two being incorrect. Height, weight, and waist circumference (WC) were taken by trained investigators. BMI was calculated using: $BMI = \text{Weight (kg)} / [\text{Height (m)}]^2$, and BMI raw data were then converted to age and gender z-scores (WHO, 2007) and categorized as underweight, normal weight, or overweight/obese. In separate multinomial regression analyses (and controlling for age, gender, and WC), *Being Skinny* and *Looking Good* were used to predict if responses were associated with BMI status.

Results: A greater percentage of underweight children (30.8%) thought that *Being Skinny* was *Healthy* compared to normal weight children (26.3%; $p=0.033$). In contrast, a greater percentage of overweight/obese children (45.2%) thought *Looking Good* was *Healthy* compared to normal weight children (30.5%; $p=0.028$).

Conclusion: Results suggest that children have varying pre-existing conceptions about health and perhaps, a child's BMI may be used a predictor of these potential preconceived notions. Specifically, results indicate that underweight and overweight/obese children have less of an understanding of what *Healthy means*. Future health-related interventions should be aimed at educating children not to equate health with appearance.

P2.226

Participants' experiences two years on from the 'Healthy Eating and Lifestyle in Pregnancy' Trial

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

To present data from the 'Healthy Eating and Lifestyle in Pregnancy: 2 year follow-up' study, which aims to assess the long-term outcomes for mothers and babies who took part in the 'HELP' trial. This was a cluster RCT which involved a group-based intervention for obese pregnant women that was facilitated by midwives and slimming world consultants and was designed to support women during pregnancy to moderate weight gain and reduce BMI 1 year after birth.

This paper aims to explore participants' experiences 2 years after giving birth. Discussions will focus on participants' healthy eating and physical activity behaviours post-intervention group, and their weight loss and weight maintenance success. It will also explore parental impact on the two year child, and eating and activity behaviours for the child and family.

Methods:

45 women took part in semi-structured telephone interviews. Participants were sampled across 20 centres; by treatment, attendance at intervention group and weight change. Data was collected at around 2 years post-birth, and analysed using thematic analysis.

Results/findings:

Participants' accounts provide insight into the long-term impact of this intervention on women's individual behaviours in relation to healthy eating and physical activity, which was the focus of the HELP intervention. Issues pertinent to weight loss maintenance are highlighted, including facilitators and barriers to long-term behaviour change, and the potential of interventions such as this to have an effect post-pregnancy. Interesting themes were also identified in relation to weight management for the child and behaviours in families where the mother has experienced weight management difficulties. Themes focus on feeding practices of parents who have experienced being obese and parental attitudes towards diet and physical activity behaviours of their children.

Conclusions:

This work contributes reflections on the long-term value of interventions such as HELP, especially in a pregnant population, and identifies issues that arise for participants post-intervention in terms of maintaining weight loss and diet and physical activity behaviours. It also contributes to our understanding of the development of children's diet and activity behaviours in a potentially 'obesogenic environment'.

P2.227

The association between obesity and cognitive function in healthy premenopausal women

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

To test for the associations between obesity and cognitive function in premenopausal healthy women (18-50 years)

Methods: From a healthy lifestyle screening cohort (n=220) we randomly selected 98 women aged 18-50 years. Based on their body mass index (BMI), participants were classified as normal weight (BMI<25 kg/m²), overweight (BMI:25-29.9 kg/m²), obese (BMI:30-34.9 kg/m²) or morbidly obese (BMI>35 kg/m²). Body composition was examined by dual energy X-ray scan and cardio respiratory performance (VO₂ Max) was assessed by Bruce treadmill test. All participants completed the Cambridge Neuropsychological Test Automated Battery (CANTAB) to assess cognitive performance in three domains: attention, memory, and executive function. The Reaction Time (RTI) test was used to assess motor and mental response speeds, and Stockings of Cambridge (SOC) test was used to assess planning executive function. For memory assessment, the delayed match to sample (DMS), pattern recognition memory (PRM) and spatial span (SSP) tests were used to assess forced choice recognition memory, visual pattern recognition memory, and working memory capacity respectively. Tests were carried out between 09:00-11:00.

Results: Of the 98 women, 37% (36)% were morbidly obese, 22.4% (22) obese and 23.5% (23) overweight. Performance on RTI simple and complex tasks as well as SOC planning ability were not associated with BMI. DMS mean time to correct response, when stimulus is visible or immediately hidden (0ms delay), was higher by (785±302 ms, P=0.011) and (587±259 ms, P=0.026) in morbidly obese women compared to normal weight women. Memory span length was significantly lower in overweight (5.5±1.3, P=0.008) and obese women (5.6±1.6, P=0.007) compared to normal weight (6.7±0.9). The latency to correct response on DMS and PRM was negatively correlated with percentage of body fat, but not with VO₂ Max.

Conclusion: In this sample of healthy premenopausal women, obesity did not impair cognitive performance related to attention, memory, or planning executive function but morbid obesity may be associated with higher latency to correct response on memory specific tasks and lower memory span length.

P2.228

Compensatory beliefs and eating styles of consumers of meal-replacement products

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SIG: Yes, Cancer Prevention and Management

Awards: No

Objective: Meal-replacement products (MRP) are widely used for weight management purposes. However, there is little scientific research on the eating motives and beliefs relating to MRP consumption. MRPs are marketed as beneficial for weight reduction and control. It is plausible to assume that people who want to diet or who have a tendency to overeat are more likely to consume MRPs. Moreover, the latter category may assume that MRPs may compensate for overeating. The present study takes a new look at MRP consumers. Dietary restraint, the overeating tendencies of emotional and external eating as well as compensatory beliefs were assessed among MRP consumers and non-MRP consumers.

Methods: The study is based on an online survey of 455 women (218 MRP consumers and 237 non-MRP consumers) conducted in the German-speaking parts of Switzerland. Participants answered questions relating to their eating styles (restrained, emotional and external eating) and their compensatory beliefs in relation to MRP consumption (e.g. 'If I consume a meal replacement product now, I can eat a calorie-dense snack later').

Results: The results showed that MRP consumers were more likely to be restraint or emotional eaters and tended to overeat. Moreover, compensatory beliefs were much more pronounced in consumers of meal-replacement products than in non-consumers. Additionally, MRP consumers reported a higher cross-behaviour regulation relating to overall dietary control and physical activity.

Conclusions: MRPs seem to be seen as a means to compensate for eating high-energy and palatable foods. MRP consumption is also associated with dietary restraint and overeating tendencies. These products may help restrained eaters to maintain their dietary goals by replacing potentially tempting meals that may activate eating enjoyment and inhibit their dietary goals. MRPs may also be used by emotional eaters either to replace food that they tend to overeat or to compensate for having overeaten food due to negative emotions.

P2.229

Characteristics, perceptions, and dieting behaviors of high school students who skip breakfast to control weight

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: To compare the dieting behaviors, perceptions, and weight status of high school students who do and do not report skipping breakfast to avoid weight gain.

Methods: The sample consisted of 791 9th and 10th grade students who reported regularly skipping breakfast (≥ 2 school days/week). Participants (55.3% female, 30.9% non-white) were recruited from 15 rural Minnesota high schools enrolled in an intervention study designed to increase school breakfast participation. Surveys, anthropometric data, and school-provided data collected at baseline were analyzed for associations between skipping breakfast for weight control and related factors. Chi-square tests and two-sample t tests were used to compare groups for categorical variables and continuous variables, respectively.

Results: Of 791 respondents, 123 (15.5%) agreed with the statement "I skip breakfast because it might cause me to gain weight." These students were more likely to be female (73.6%) than those who disagreed with this statement (52.0%); there were no significant differences in race, ethnicity, grade, age, or free/reduced-priced meal program eligibility between the two groups. Those who reported skipping breakfast to avoid weight gain were more likely to report dieting at least once in the past year (84.5% vs. 34.4%, $p<.001$) and engaging in weight control behaviors characterized as unhealthy (84.5% vs. 34.6%, $p<.001$) and extreme (29.3% vs. 3.1%, $p<.001$). The most common unhealthy weight control behaviors included eating very little food (77.6%) and fasting (60.3%); the most common extreme behavior was vomiting (20.7%). These students were significantly more likely to report barriers to eating school breakfast (e.g., not hungry in the morning) and were less likely to believe that eating school breakfast could help them maintain or reach a healthy weight (56.9% vs. 73%, $p<.001$). Students who reported skipping breakfast to avoid weight gain were more likely to be overweight/obese (47.1% vs. 33.3%, $p=.004$) and food insecure (23.6% vs. 12.7%, $p=.003$).

Conclusions: High school students who skip breakfast as a weight control strategy are more likely to engage in other unhealthy dieting behaviors and report a number of barriers to eating breakfast. Future interventions should address the beliefs and high-risk behaviors reported by this population of young people.

P2.230

The relationship between individual and neighbourhood socioeconomic status (SES) and body mass index (BMI) among a multi-ethnic population in Singapore

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Obesity is a risk factor for many chronic diseases and prevalence rates continue to rise globally. While neighbourhood socioeconomic status (SES) is a determinant of obesity risk in high-income Western countries, it is unclear to what extent neighbourhood factors influence obesity in high-income Asian countries. This study aims to explore how neighbourhood SES is associated with body mass index (BMI) in the Singapore population.

Methods: Cross-sectional data on socio-demographic characteristics, anthropometrics, and residential building postal codes were utilised from two large population-based cohort studies in Singaporean adults. In Singapore, residence type (government subsidised housing (HDB), private condominiums or landed housing) and housing size are good indicators of SES. Therefore, the proportion of total units by residence type (1/2-room HDB, 3-room HDB, 4-room HDB, 5/executive-room HDB, condominium, landed housing) were calculated for all residential buildings within a Euclidian buffer of 200- and 500-metres from a subject's own residence and were used as a proxy for neighbourhood SES. Multivariate regression analyses examined neighbourhood SES within 200- and 500-m in relation to individual BMI adjusting for individual socio-demographic characteristics.

Results: Of the total 10,059 subjects included in the analysis, 55% were female, 39% Chinese, 29.5% Malay, and 30.3% Indian, with a mean age of 44.0±12.7 years and a mean BMI of 25.2±5.1 kg/m². Ethnicity, educational attainment, and work status, but not income and gender, were independent significant indicators of BMI. Subjects' own residential building type was related to BMI when adjusting for age, gender, and ethnicity for those living in 5/ executive-room HDB ($\beta = -0.75$ kg/m², $p = 0.002$), condominiums ($\beta = -1.17$ kg/m², $p < 0.001$), and landed houses ($\beta = -1.01$ kg/m², $p = 0.003$). When we examined neighbourhood SES by 200- and 500-m buffers, only condominiums were significantly associated with BMI ($\beta = -1.18$ kg/m², $p = 0.02$) at 200-m. When we further adjusted for individual SES in the association between neighbourhood SES and BMI, neighbourhood SES did not remain significantly associated with BMI.

Conclusions: Neighbourhood SES beyond an individual's residence type is not associated with BMI in Singapore. Individual characteristics related to SES and ethnicity may be more important determinants of BMI.

P2.231

Unhealthy Eating and Higher BMI is Partly Caused by Low Self Control

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Although the rise in unhealthy eating over the past decades has many causes, the inability to exercise self-control, when tempted by increasingly abundant and affordable high-calorie foods rich in salt, added sugar and saturated fat, is a key contributing factor. The purpose of this study is to examine the prevalence of health related self-control problems in Denmark and how self-control problems impacts food purchase patterns, exercising and the Body Mass Index (BMI).

Methods: We use a panel of 2500 Danish consumers for whom we have detailed information about the nutritional composition of their purchased food on a daily basis from 2009 - 2013. Furthermore we have annual information about their BMI, exercises patterns, socio demographic characteristics as age, education, residence as well as attitudes towards healthy foods and exercises patterns. In 2013 we issued a questionnaire to the panel, which were used to identify the degree of self-control problems, their time preferences as well as relative risk preferences. To identify self-control problems we used Tangney's "Self-Control Scale" and the self-control measure developed by Ameriks et al. in 2008. To identify the level of time preferences, we use a measure developed and tested on Danish households and relative risk preferences is measured by the Eckel and Grossman measure. To measure differences in BMI, consumption and exercises patterns for consumers with different degrees of self-control problems we estimate an unobserved effects model controlled for socio-demographic characteristics, time preferences and relative risk preferences.

Results: We find that approximately half of our sample has limited self-control, which results in increased purchases of total energy from food, saturated fat and total fat, as well as unhealthy food items such as soft drinks, cakes and chocolate. We also find that self-control problems significantly increase BMI. Self-control problems do not seem to impact purchases of fruit and vegetables, or time spent actively exercising.

Conclusion: Our findings suggest that the level of self-control influences the ability to abstain from temptations, but to a much lesser extent engagement in health behavior or healthy consumption.

P2.232

Reasons for wanting to lose weight in obese adults with intellectual disabilities and views of their carers.

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SIG: Yes, Motivational Dynamics

Awards: No

Objective:

Obesity is more prevalent in adults with intellectual disabilities (ID) compared to the general population. A person's reason for weight loss may influence weight loss success and could be used to maximise engagement with weight management programmes. To date, motivation for seeking weight loss has only been studied in adults without ID. This study aimed to determine 1) reasons given by obese adults with ID for wanting to lose weight 2) whether reasons differ from those of adults without ID and 3) whether responses from individuals and their carer differ?

Methods:

Prior to receipt of a weight loss intervention, obese participants were asked "why do you want to lose weight?" The question was repeated until no more answers were given. Where possible, participants' carers were asked why they thought the individual could benefit from weight loss. Responses elicited from participants and carers were categorised and themes emerged.

Results:

Eighteen men and 32 women; age 41.6 SD 14.6 years; BMI 40.8 SD 7.5 kg/m²; Level ID Mild (28%), Moderate (42%), severe (22%), Profound (8%) participated. Eleven were unable to respond to the question. Six themes emerged from responses; Health; Fitness / Activity / Mobility; Appearance / Clothes; Emotional / Happiness; For Others; Miscellaneous. The most frequent reason given overall and by women was "appearance." Men cited "fitness" most frequently. Carers cited "health" most frequently and "appearance" least frequently, only agreeing with participants on four occasions. "Health" was cited most often in older people (>50), "fitness," in middle age (30-49) and "emotional happiness," in younger adults (<29 years). "Health" was given as a reason more from those with mild ID and higher BMIs.

Conclusions:

This study showed that views of obese adults with mild to moderate ID, and those of their carers can be collected. The opposing views of adults and their carers may affect motivation for any weight loss attempts. These responses differ from those of adults without ID where health was the most reported reason for seeking weight loss. Utilising the individual's motivations may maximise engagement with weight loss treatments.

P2.233

The importance of insight when establishing a food addiction diagnosis using the Yale Food Addiction Scale.

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SIG: No, this does not fit in any of the special interest groups

Awards: No

Purpose: According to the Yale Food Addiction Scale (YFAS; Gearhardt et al., 2009b), a widely used instrument, food addiction (FA) may be diagnosed when three or more criteria are endorsed and significant distress/impairment regarding FA-related behaviors is reported. However, it has been observed that a significant number of individuals endorse the criteria of FA without reporting distress/impairment and thus, fail to meet FA diagnosis. Even though a one-factor structure has usually been found for the YFAS, a two-factor structure was recently identified, the second factor representing levels of insight regarding FA symptoms (Brunault et al., 2014). This is the first study that intended to compare individuals meeting FA criteria without reporting distress/impairment (non-distress group) and those meeting FA criteria while reporting distress/impairment (distress group) on insight and BMI.

Methods: Participants were individuals seeking help for eating or weight difficulties, recruited as part of a larger cross-sectional research protocol involving clinics affiliated with Laval University. They were weighted and measured, and completed the French-validated version of the YFAS. Only those endorsing more than three criteria on the YFAS were included (N=40, mean BMI=39.55 kg/m²). An independent samples t-test was conducted to compare both groups on insight levels, measured as the sum of the items forming the second factor of the YFAS, and BMI.

Results: Analyses showed that insight levels differed significantly between the two groups ($t(38)=-8.99$, $p=.000$). More specifically, it was observed that participants from the non-distress group presented lower insight regarding their FA symptoms compared to their distressed counterparts. The former also presented a significantly higher average BMI ($t(38)=3.55$, $p=.001$) than the latter.

Conclusions: Findings from this study highlight the relevance of insight when using a self-reported instrument to establish a diagnosis among a clinical population, as individuals may not be aware of their suffering. In terms of clinical implications, lower insight levels could keep individuals even further from their suffering, leading to more weight gain before seeking help. Therefore, interventions with this population could benefit from better awareness training.

P2.234

Comparison of Consumer Perceptions about Dietary Fat between Overweight and Normal Weight Individuals

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Limiting total dietary fat for the benefit of weight management remains a controversial topic. The purpose of this study was to compare perceptions about fats in the diet and associated eating habits between consumers with different Body Mass Index (BMI) status.

Methods: Canadian consumers (n=2,994) participating in an online survey were asked to report their height and weight and to indicate the degree to which they agreed or disagreed with a number of statements relating to fat and calories in the diet. Questions were rated using a numbered 1 to 7-point Likert scale. After excluding those who reported invalid heights or weights (n=176), there were 2,818 respondents. The BMI was calculated for each individual and mean scores for each BMI group (obese, overweight, normal, underweight) were determined while controlling for sex, age and education.

Results: While obese and overweight adults shared similar perceptions about calories and different types of fat in the diet as normal weight adults, they were more concerned about total fat. Obese and overweight individuals agreed more strongly that it is important to reduce total fat in the diet compared to normal weight individuals (5.2±0.1 and 5.1±0.0 vs. 4.8±0.0 for obese, overweight, and normal weight individuals, respectively), and obese individuals agreed more strongly that fats cause weight gain (4.7±0.1 vs. 4.3±0.1). Regarding individual eating habits over the past 12 months, obese and overweight individuals reported larger reductions in the amount of fat (5.0±0.1 and 4.9±0.0 vs. 4.7±0.1) and calories (4.7±0.1 and 4.6±0.0 vs. 4.2±0.1) in their diets compared to normal weight individuals. However, no significant differences were found with regard to limiting fast foods; limiting high calorie foods such as sugar, cakes and pastries, chocolate and candies, etc.; or limiting butter, cream, margarine, lard and shortening.

Conclusions: Overall, it would appear that obese and/or overweight individuals focus more on total fat in the diet than normal weight individuals, including its link to body weight. Future research should further explore the controversy regarding fat and body weight and help to identify more effective approaches for losing weight in overweight and obese individuals and supporting healthy food choices.

P2.236

Explaining weight histories: Creating and using timelines in qualitative research as a data analysis method and interview technique

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The purpose of this study is to explain how social, environmental, and life-course events influence changes in weight over time. This study also pilot-tested the use of weight timelines—visual depictions of weight histories elicited during qualitative interviews. Timelines were created as a unique method to enhance the quality of member checks during follow-up interviews and to provide a novel tool for qualitative data analysis.

Methods: Bariatric surgery patients were recruited to participate in three semi-structured interviews. The first interview occurred prior to surgery; two follow-up interviews occurred approximately 6 and 12 months post-operatively. Topics covered during pre-surgery interviews included current weight, past weight changes, dieting history, perspectives on weight, and experiences with obesity. Interviews were audio-recorded and transcribed verbatim. After review of transcripts, individual timelines were drawn depicting self-reported weight changes from childhood/adolescence through to the present. Timelines were annotated with the life-events, diets, or other factors participants explained as affecting weight. During the second interviews, timelines were reviewed with participants to confirm events and interpretations and to uncover additional details. All transcripts were coded using a constructivist, life-course perspective for common themes related to weight. Timelines were compared for similarities and differences in patterns of weight changes.

Results: 24 female and 6 male bariatric surgery candidates with diverse socioeconomic and life-style backgrounds were recruited. Timelines were confirmed with 25 participants. Most participants reported that the first timeline was representative of their experiences; few timelines were altered after the second review. A majority of participants reported onset of overweight or obesity beginning in early adulthood, however, some described weight problems in childhood. Weight history timelines were grouped into categories based on similarities in patterns of change. Themes related to weight included physical activity, youth/metabolism, structured dieting, life-events, emotional eating, "getting off diets," lifestyle and work, and "not caring about me."

Conclusion: Weight changes and the progression of obesity are influenced by life-course, environmental, and individual factors. Timelines are an effective method for confirming interpretations and eliciting detail during interviews and provide a useful tool for qualitative data analysis.

P3.1

Community Gardens in rural settings to improve dietary quality among low-income residents

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SIG: Yes, Policies and environments

Awards: No

Objective: The U.S. Centers for Disease Control and Prevention list the benefits of community gardens, including providing the opportunity to eat fruits and vegetables and engage in physical activity. The goals of this research were to examine the impact of community garden participation on low-income rural residents.

Methods: With funds from the USDA Supplemental Nutrition Assistance Program (SNAP-Ed), we investigated the effect of community gardens on low-income residents' eating behaviors in 5 rural counties across North Carolina. The goal of the SNAP-Ed program is to improve the likelihood that SNAP (the U.S. program formerly called Food Stamps) recipients will make healthy food choices with a limited budget and choose active lifestyles. In October 2013 through September 2014, UNC established 2 community gardens each in 5 rural counties (n= 10) with the goal of connecting the target population with fruits and vegetables in low-access, highly rural areas. The garden locations were identified and maintained by community members both from and serving the target population. The intervention lasted seven months. Pre and post surveys were administered to observe changes in healthy eating behaviors. Weekly records were maintained to track the number of garden participants and the produce yield. Qualitative interviews were conducted with community garden managers to assess the implementation of the gardens.

Results: The gardens ranged in size from three raised beds to a quarter acre. Garden participants' knowledge of gardening increased over the course of the intervention, as did access to vegetables. At its peak, the intervention engaged 128 SNAP-eligible participants who received garden produce across 5 counties (a total of 2,750 pounds harvested, range of 50 to 1,500 pounds/ garden). We found that all gardens were communally managed, most by people with little to no gardening experience. Interviews with the garden managers (n=10) have shown that more gardening education and better ways to measure garden yield are needed.

Conclusions: Our findings on the impact of community gardens on their low-income participants and barriers to implementation in rural communities can be used to guide other communities who want to improve healthy food access in such settings.

P3.2

Star ratings: A comparison of two front-of-pack nutrition labelling systems

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: Front-of-pack nutrition labelling (FOPL) may assist consumers to identify healthier food choices. The aims of this study were to a) model how two star-based FOPL systems rated supermarket products, and b) to assess whether these ratings were aligned with national dietary recommendations.

Methods: Packaged food and drink products (n = 20,225) were categorised into scoring levels using criteria for the Australian Health Star Rating system (HSR), which was applied to all foods, and a USA 3-star system, which was applied to products meeting minimum eligibility criteria. Product nutrition information was previously collated by the George Institute for Global Health. Comparison of the two systems, by food category, was made by exploring differences in median standardised scores. Alignment with Australian Dietary Guidelines was assessed with regards to the ratings awarded to core and discretionary foods.

Results: When applying the USA 3-star criteria, 55% of products scored zero points, indicating that they were a poor food choice, and 25% scored the maximum three points. Using the HSR system, 15% of products scored 3.5 stars, 13% scored the minimum 0.5 stars and 4% scored the maximum five stars. Median scores were higher using the HSR compared to the 3-star criteria for all except three of the 16 food categories (bakery products, fish products, and sauces/spreads). Notable differences between the two systems were found when comparing scores for the food categories convenience foods, edible oils, and dairy foods. Across the entire sample, core foods were awarded higher median ratings than discretionary foods. This was also true for eight of the 16 food categories: bakery products, cereal products, fish products (HSR only), fruit and vegetables, convenience foods (3-star system only), meat products, dairy, and special foods. Some discretionary foods did however receive higher scores than core foods.

Conclusions: Generally, both FOPL systems did align with Australian Dietary Guidelines, awarding higher ratings to the core food groups vegetables, fruits, cereal products, and lean meats/alternatives. However, modifications may be required to ensure that all product ratings are consistent with dietary recommendations.

P3.3

Calorie intake, calories required, and mortality in an older population

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: This study is central to evaluating the interaction effects of calorie intake and calories required with all-cause and cardiovascular disease mortality among participants aged 60 or above in 4,846 participants aged 60 or above in the National Health and Nutrition Examination Survey (NHANES) III conducted from October 1988 to October 1994.

Methods: The NHANES III data were linked with death certificate data in the National Death Index through December 31, 2006. Participants were interviewed to complete a 24-hour dietary recall, and their calorie intake was computed based on the University of Minnesota Nutrition Coordinating Center nutrient database data. Calories required per day were computed using the revised Harris-Benedict equation. Both calorie intake and calories required were grouped into quartiles. Cox regression was used to estimate the hazard ratio (HR) of calorie intake and calories required on all-cause and cardiovascular disease mortality, with the first quartile as the reference group. The HR was adjusted for race, education level, smoking status, hypertension, type 2 diabetes, and high C-reactive protein level, with age, sex, and BMI unadjusted to avoid double adjustment.

Results/findings: The sample mean age was 72.26 (SD 8.02). The average calorie intake and calories required of the participants were 1,666.43 (SD 752.26) and 2002.46 (SD 505.84) kcal per day. The first, second, third, and fourth quartiles of the calories required per day were <1604.45, 1604.45 - 1936.22, 1936.22 - 2327.85, and ≥2327.85 respectively. Within the follow-up period, there were a total of 2,954 deaths (61.0%), more than half (n=1,532) of which were caused by cardiovascular disease. Relative to those in Quartile 1 of calorie intake, only Quartile 4 was associated with all-cause mortality with a HR of 0.86 (95% CI=0.77,0.96). Relative to those in Quartile 1 of calorie intake, only Quartile 4 was associated with cardiovascular disease mortality with a HR of 0.76 (95% CI=0.65,0.89). Calorie intake and calories required were independently associated with all-cause and cardiovascular mortality with an insignificant interaction effect.

Conclusions: Regardless of the number of calories required, higher calorie intake was associated with lower HR of both all-cause and cardiovascular mortality in older adults.

P3.4

Understanding real-life use of front-of-pack nutrition information labels in routine supermarket shopping; a qualitative study

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Providing health information, such as front-of-pack nutrition information, is a potentially useful way to help people choose healthier foods. A large evidence base exists around consumer use and understanding of nutrition labelling but much remains unknown, particularly in a real-life context. This study uses novel data collection methods to explore when, how and why consumers use front-of-pack nutrition labels during routine supermarket shopping.

Methods: Data was collected from 31 adult shoppers who took part in either a 'think-aloud' accompanied shop or wore a wearable camera or eye-tracking glasses during a routine shop in two stores of a national supermarket chain. Half the shoppers were prompted to use front-of-pack nutrition labels to inform their choices. After their shop, each participant completed a paper-based questionnaire, to identify participant characteristics, and took part in a semi-structured individual interview which discussed the rationale for product purchases (and non-purchases) and use of labels, using either observations or captured images as a prompt. Image data was coded manually according to predefined criteria. Interview data was audio-recorded, transcribed verbatim and analysed using a thematic analysis approach, based on the principles of modified grounded theory.

Findings: Spontaneous use of front of pack nutrition information was not common. Shoppers demonstrated skill in balancing a complex web of pertinent and inter-related factors which influenced purchasing decisions and left little opportunity for consideration of health issues in a time-pressed environment. Front of pack nutrition information was used with new/unfamiliar products, for product comparisons and for people with special diets. While some shoppers found using labels straightforward, others struggled to make sense of simple descriptors and traffic light colours and many misunderstood complex concepts like how to interpret portion size and percentage Guideline Daily Amounts. The use of images combined with interviews prompted an in-depth and contextually rich discussion which informs our understanding of the range of conflicting decisions being considered by consumers at point-of-choice.

Conclusions: Routine use of front-of-pack nutrition information labels was low amongst the participants in this UK study. Interventions are required to help shoppers make sense of basic nutrition information and to prompt their use at point-of-choice.

P3.5

Assessing Consumers' Knowledge and Use of Food Labels

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: To evaluate consumers knowledge, understanding and use of food labels

Methods: A cross sectional survey of 440 food shoppers was carried out at Ariaria International market. Self administered questionnaire was used to obtain information on socio-demographic characteristics, knowledge, understanding and use of food labels. Actual reading of labels was gathered by in-store personal observation. Knowledge was classified as poor, fair and good. Data were analyzed using descriptive.

Results: Approximately 23% actually looked at or read labels before selecting a food item to purchase. Self reported reading of labels was however high (96.6%) with about half of them (52.7%) reporting regularly consulting food labels before making purchases. Few (26.6%) had good knowledge of information on food labels. The commonly sought information on labels was the product expiry date (45.7%) and nutrient information (36.1%). Consumers had more interest in the cholesterol/fat (48%) and sugar (38.6%) content of foods they are purchasing.

Conclusion: The findings indicate that observed use of food labels was actually low even though self reported use was high. Regulatory bodies should put in more effort to adequately sensitize consumers on its importance.

P3.6

Development of an implementation intentions intervention promoting healthy eating among pregnant women at risk of developing gestational diabetes mellitus

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Studies among women with a history of gestational diabetes mellitus (GDM) indicate that most of them have suboptimal fruit and vegetable (FV) intakes, even though their consumption would protect against the onset of type 2 diabetes and GDM. A systematic review on implementation intentions interventions indicated that it is an effective tool to promote healthy eating among the general population. To our knowledge this technique has never been tested among pregnant women at risk of developing GDM. The objective was to describe the development of this type of intervention to promote healthy eating among a population of high-risk pregnant women.

Methods: A total of 28 women with a history of GDM or who were overweight (body mass index > 25 kg/m²) before their pregnancy completed an online open-ended questionnaire about barriers and solutions concerning FV consumption. Completion took between 10 to 15 minutes. Separate items for fruits and vegetables were used given that there is evidence that different barriers are cited for each food group. The most important beliefs were identified using a 75% criterion for frequency of mention.

Results: Participant's mean age was 37.6±4.6 years. The majority of women had two children (57.1%), a university diploma (53.6%) and a mean household gross annual income higher than CA\$ 71 000 (78.6%). Fifteen barriers to fruit consumption and 13 for vegetables, and 17 solutions for eating fruits and 11 for eating vegetables were mentioned by women. Content analysis indicated that the main barriers and solutions for FV consumption were related to lack of time. Barriers and solutions common to fruits and vegetables were also identified as well as some specific to each food group. This information allowed the development of an implementation intentions tool adapted to this population of women at risk of developing GDM (e.g., If I lack time, then I will use frozen FV).

Conclusions: We successfully developed the implementation intentions intervention. If the intervention proves to be successful in increasing FV consumption, limiting excessive gestational weight gain or preventing GDM, it could be disseminated among health professionals in charge of meeting pregnant women at risk of developing GDM.

P3.7

Associations between dietary intake, diet quality and depressive symptoms in first-time mothers

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective:

Diet may be an important determinant of mental health, however little is known about the impact of dietary intake on depressive symptoms among first-time mothers. The objective of this study was to determine the association between fruit, vegetable, fish consumption, diet quality and depressive symptoms in an Australian sample of first time mothers.

Methods:

Cross-sectional baseline data (3 months postpartum) were obtained from the Melbourne InFANT (Infant Feeding, Activity and Nutrition Trial) Extend Program. Participants included Australian first-time mothers aged 19-45 years from the Geelong and Melbourne regions of Victoria, Australia (n=457). Diet over the past year was assessed via a validated self-administered 137-item food frequency questionnaire. Adherence to the 2013 Australian Dietary Guidelines was assessed using a previously developed dietary guideline index (DGI) as a measure of diet quality. Depressive symptoms were determined using the Centre for Epidemiologic Studies Depression Scale (CES-D 10). Relationships between diet quality, fruit and vegetable intake (serves per day), frequency of fish intake and depressive symptoms were investigated using linear regression adjusted for relevant covariates (age, socioeconomic position, smoking status, physical activity, television viewing time, sleep quality, and BMI).

Results:

Higher diet quality, as indicated by a higher score on the DGI, was associated with lower depressive symptoms after adjusting for covariates ($\beta = -0.034$; 95% CI = $-0.056, -0.012$). There were no other significant associations between fruit, vegetable or fish intake and depressive symptoms.

Conclusions:

Increased adherence to the Australian Dietary Guidelines was associated with better mental health status among Australian first-time mothers. To our knowledge this is the first study to investigate diet quality and depressive symptoms among first time mothers. These findings will inform future public health nutrition initiatives among this target group, such as promoting healthy dietary patterns to first time mothers to prevent depressive symptoms.

P3.8

The influence of parental marital status throughout childhood and adolescence on overweight and obesity in first-time pregnant Swedish women

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Objective: To investigate the associations between parental marital status trajectories in the first 18 years of life and offspring's overweight and obesity later in life.

Methods: We included all women born in 1975 who gave birth to their first child in Sweden between 1993 and 2010, whose pre-pregnancy weight and height was recorded in the Swedish Medical Birth Register, and whose parents' marital status was recorded in the Swedish population registers (N=30,818). Women's pre-pregnancy weight and height were used to estimate BMI and women with a BMI ≥ 25 Kg/m² were classified as overweight/obese. Mother's marital status was measured annually during the first 18 years of life of the index women (1975 - 1992); classified as one of the following mutually exclusive states: (1) single, (2) married to the father, (3) cohabiting with the father, (4) separated from husband, (5) divorced from husband, (6) separated from cohabiting father, (7) married to other, (8) divorced from other, (9) widowed, or (10) dead; and summarized into clusters with sequence analysis using the TraMineR package in R. Logistic regression analyses were conducted with women's overweight/obesity status as the outcome and mother's marital status cluster classification as the main predictor.

Results: Six clusters emerged from the sequence analysis, classifying mothers' marital status trajectories into "stable marriage," "stable cohabitation," "married then divorcing," "cohabiting then separating," "not with father," and "varied transitions." Women whose mothers belonged to the "stable cohabitation" (OR=1.29, 95%CI=1.18-1.42), the "married then divorcing" (OR=1.11, 95%CI=1.03-1.20), the "cohabiting then separating" (OR=1.17, 95%CI=1.06-1.30), the "not with father" (OR=1.24, 95%CI=1.09-1.41), or the "varied transitions" (OR=1.24, 95%CI=1.13-1.35) clusters had increased odds of being overweight/obese when compared to women whose mothers belonged to the "stable marriage" cluster.

Conclusions: Women whose parents remained married throughout their upbringing had the lowest odds of starting their own pregnancies overweight or obese. Potential modifying effects of parental socioeconomic position and the role of timing of first pregnancy in understating these effects are to be established in further analyses.

P3.9

Diet quality is associated with depression in older Australians: the WELL study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: To examine associations between diet quality and self-reported depression over four years in older men and women.

Methods: Adults aged 55-65 years (n=1056 men and n=1136 women) completed a postal survey including an 111-item food frequency questionnaire at baseline and four years. Diet quality at baseline and four years was assessed via the revised dietary guideline index (DGI). The 15-item Geriatric Depression Scale (GDS) assessed self-reported depression at four years. Men and women with a GDS score of 5 or more were classified as depressed. Associations between diet quality and depression were assessed in the whole sample and separately for men and women using logistic regression adjusted for age, sex, education, marital status, retirement age, smoking, self-reported leisure time physical activity (MET/week) and self-reported BMI. Odds ratio and 95% CI for 10-unit increase in DGI is reported.

Results: In the whole sample, a 10-unit higher DGI score was associated with lower depression cross-sectionally (0.88, 0.80-0.98) and after four years (0.90, 0.82-0.99) after controlling for age, sex, education, marital status and retirement age. The association did not remain statistically significant after controlling additionally for smoking, leisure time physical activity and BMI. No relationship between DGI score and depression was observed in men. However in women, a 10-unit higher DGI score was associated with lower depression cross-sectionally (0.73, 0.63-0.85) after controlling for age, education, marital status and retirement age and remained in the fully adjusted model (0.78, 0.67-0.90). A trend for lower depression at four years in women with a higher score in DGI was also observed (0.87, 0.75-1.00), although this relationship did not remain in the fully adjusted model.

Conclusions: Better diet quality is associated with lower depression among older women but not men. Further investigations to determine if associations between diet quality and depression continue over longer periods of follow-up are warranted. Synergistic relationships between diet quality and lifestyle behaviours such as physical activity and smoking, and their relation to depression should also be investigated.

P3.10

Dietary patterns and healthy aging: a systematic review

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: To review current literature regarding relationships between dietary intake assessed using whole-of-diet approaches (or dietary patterns) and healthy aging in older adults.

Methods: A systematic review was conducted of studies examining dietary patterns and health and well-being in later life including quality of life and health status, physical function, cognitive function and mental health among adults aged 45 years and over. Literature searches were conducted in Medline complete, Academic search complete, CINAL complete, Ageline and Global health, and PsychInfo (through EBSCO Host), SCOPUS and embase with additional hand searching. Inclusion criteria included dietary pattern assessment via dietary indices or statistical approaches, at least one health and well-being outcome measure listed above, a sample of community-dwelling adults aged 45 years and over at baseline and a cross-sectional or longitudinal study design. Exclusion criteria included a single 24-hour recall of diet, evaluation of single foods or nutrients, clinical or institutionalised samples and intervention studies. Risk of bias was assessed using the six-item Effective Public Health Practice Project's Quality Assessment Tool for Quantitative Studies.

Results: The literature search yielded 1015 results. There were 23 articles (8 cross-sectional and 15 longitudinal) included in the final review with 17 studies examining dietary indices and 8 studies using a statistical approach (principal component analysis or cluster analysis). Most studies had a moderate to high risk of bias, with only two studies rated as a low risk of bias. The majority of studies examined psychological health (mental health n=7 or cognitive function, n=13), with fewer studies examining other outcomes (quality of life or health status, n=4; physical function, n=5). Although dietary pattern and outcome measure assessment method varied greatly between studies, the majority reported positive associations between a healthier diet and better health outcomes, both cross-sectionally and over time.

Conclusions: Overall, the number of studies using whole-of-diet analysis to investigate diet and healthy ageing is small, particularly studies examining quality of life and physical function. Further investigation of dietary patterns and healthy ageing in longitudinal studies is needed. These studies provide evidence for the role of a healthy diet in supporting our ageing population world-wide.

P3.11

Determinants of fruit and vegetable intake in mid-late adulthood: Results from a longitudinal cohort study

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: It is recognised that a diet containing a high intake of fruits and vegetables plays a role in good health, yet few adults over 55 years are meeting recommended guidelines. There is scant research focusing on the determinants of eating behaviours in this age group, therefore the aim of this study was to investigate the determinants of fruit and vegetable intake in adults at the peri-retirement life-stage.

Methods: Men and women aged 55-66 years were recruited into the Wellbeing, Eating and Exercise for a Long Life study from the Australian Electoral Roll (n=1835, 49.3% men). The social-ecological framework was considered for selection of potential determinants. Outcome expectancies, self-efficacy, perceptions of ageing and nutrition knowledge, and socio-demographic information were collected via a postal survey in 2010. Fruit and vegetable intake (serves per day) were assessed from a follow-up survey in 2014. Associations between outcome expectancies, self-efficacy, perceptions of ageing, and nutrition knowledge, and fruit and vegetable intake were investigated using ordinal regression models, stratified by sex and adjusted for potential covariates (socio-demographic factors, physical activity, smoking, and BMI).

Results: Odds ratios and 95% confidence intervals (OR, 95% CI) are reported. Positive associations were found with outcome expectancies (M: 1.12, 1.07-1.18; W: 1.13, 1.09-1.17), self-efficacy (M: 1.03, 1.02-1.04; W: 1.04, 1.03-1.05) and nutrition knowledge (M: 1.12, 1.05-1.20; W: 1.12 1.04-1.21) and fruit intake in both men and women. Outcome expectancies (M: 1.05, 1.02-1.09; W: 1.06, 1.04-1.09), self-efficacy (M: 1.03, 1.02-1.04; W: 1.03, 1.02-1.04), perceptions of ageing (M: 1.03, 1.01-1.05; W: 1.03, 1.01-1.06) and nutrition knowledge (M: 1.17, 1.10-1.24; W: 1.33, 1.22-1.44) were associated with vegetable intake in both men and women.

Conclusions: Greater outcome expectancies and nutrition knowledge, and higher self-efficacy for fruit and vegetable consumption are associated with increased fruit and vegetable intake in both men and women four years later. These results add to the body of knowledge in nutrition research, however further investigation is required to better understand these determinants so they can be improved and incorporated into public health programmes in the future.

Funding sources: Australian Research Council, Diabetes Australia Research Trust.

P3.13

Results of nutrition and body acceptance: health-literacy-intervention for older adults and young people

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SIG: Yes, Children and families

Awards: No

Purpose:

The study aims to improve health literacy of older adults and children. The health-literacy-intervention focuses on health-oriented behavior and the number of beverages of older adults and on body acceptance of the children. Healthy diet is an aim in both target groups and focuses on fruits and vegetables.

Methods:

The intervention was implemented and evaluated in a total of eleven guided generation-spanning groups in Coburg and Cologne during 26 weeks. The intervention included 23 meetings, twelve with older adults, four with children and seven generation-spanning meetings. This was followed by ten meetings organized by older adults. 87 seniors participated at the beginning of the intervention (85% retirees, 54% single households). In addition, 91 children took part in the intervention. 32% of the adults dropped out, 9% of these were because of project-related reasons.

The study was conducted from 2011 to 2013 in Coburg and Cologne, Germany. The baseline survey (T0) took place in January 2013 and the first follow-up (T1) in July 2013. A second follow-up was placed in September 2013. The focus of the analyses is on a T0-T1 comparison by using t-tests and wilcoxon-tests.

Results:

The consumption of fruits rose significantly from 1 to 2 servings per day in both target groups, but the consumption of vegetables was stable. Older adults reduced the consumption of sweets from 3 to less than 3 servings per week and the children from 2 to 1 serving per day. Older adults increased their number of beverages from 6 to 8 glasses per day. The body acceptance of the children rose and they showed less striving for weight-loss. 96,6% of older adults and 88,5% of children enjoyed the intervention and the intergenerational approach.

Conclusion:

The main focus on the preparation of fruits rather than vegetables can be an explanation for the unaltered vegetable consumption. Additionally a seasonal effect may biased the results of the consumption of beverages. The high degree of acceptance of Macy could be reached by the participative development of the intervention and by the multi-generation setting. The intervention will be introduced to further social services in Germany.

P3.14

Physical activity during pregnancy: Where do women get information, who do they trust and what support do they want?

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SIG: Yes, Children and families

Awards: No

Objectives:

Most pregnant women do not meet recommended levels of physical activity (PA), despite significant benefits for mother and baby. Internet or smartphone interventions offer a cost-effective means of providing health-related information and behaviour change interventions, and research suggests that large numbers of pregnant women access health information via the internet. The primary aim of this study was to establish women's experiences of, and preferences for, receiving advice and support on PA. Secondary aims were to examine women's health beliefs regarding PA in pregnancy.

Methods:

An online survey was designed using Survey Monkey. Questions were based on findings from previous research and on Protection Motivation Theory. Participants were over 18 years old, either currently pregnant or had experience of pregnancy, and living in the UK. Participants were recruited via social media, pregnancy and parenting websites/organisations, and snowball sampling. Data were analysed using SPSS v.20.

Results:

The majority of participants (N=228) had access to the internet, via smartphone (78.9%), laptop computer (72.4%) or tablet (60.5%). The most common sources of information on PA used were; midwife (46.1%), and National Health Service (NHS) website (39.9%). A quarter of women had also used commercial websites, forums and books. Only 13.6% had used a mobile or tablet application to seek PA information. These 'apps' were considered less trustworthy than NHS ($p=.005$), charity ($p=.005$) and commercial ($p=.000$) websites. Women wanted detailed and tailored information on safe activities, information on local pregnancy-specific PA services and for PA to be integrated with advice on other health topics. Planning and motivational tools were less valued. Although being active was considered important, other health behaviours including reducing smoking, alcohol and drug use, attending antenatal screening, eating a healthy diet and avoiding unsafe foods, were considered more important. Self-efficacy for PA was the only significant predictor of intention to meet PA recommendations during pregnancy.

Conclusions:

It is likely that an internet-based physical activity intervention for pregnancy would be acceptable to and welcomed by UK women. However a smartphone or tablet app might currently be under-utilised. Interventions should include tailoring and focus on increasing self-efficacy for PA.

P3.15

Food insecurity among homeless families in Paris region in 2013: the French ENFAMS study

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: Health outcomes and their social determinants have been understudied among excluded, hard-to-reach populations in France. We aimed to describe food insecurity prevalence in homeless families and the associated socio-demographic and socioeconomic factors in the French capital region.

Method: The ENFAMS study is a cross-sectional study, performed in 2013 among a random, representative sample of homeless families sheltered in emergency housing centers, social rehabilitation centers and social hotels in the Paris region. Data were collected during face-to-face interviews conducted in 17 languages. Chi-square analysis was undertaken to assess the associations between food insecurity (FI) and various factors. Poisson regressions were run separately in two groups of household income (above or under the median income: 210 €/CU).

Results: The prevalence of FI was 86.0%, 95%CI=[82.7-88.8]. Almost 70% of the homeless children living in the Paris region experienced FI; either moderate for 60.7% of them (95%CI=[56.1-65.1]) or severe for 8.5% (95%CI=[6.4-11.4]). In these families, FI was statistically associated with several factors: country of birth ($p=0.03$), resident status ($p=0.05$), proportion of lifetime spent in France ($p=0.004$), the type of housing ($p=0.03$), type of housing management (non-profit organization versus publicly-run, $p<0.0001$) and the homelessness duration ($p=0.003$). In multivariate analysis, after adjustment on monthly household income, families with less than 210 €/CU were more likely to be food secured when they lived in social rehabilitation centers than when they were in hotels ($p=0.001$), and/or when they were homeless for less than 2 years ($p=0.01$). Families with more than 210 €/CU were more likely to be food secure when they were living in a center run by a non-profit organization than in a publicly run one ($p=0.04$).

Conclusion: Food insecurity is an endemic situation among homeless families in the Paris region, one of the wealthiest regions in the European Union. This extremely high prevalence should alarm authorities and needs urgent answers since child welfare and protection is meant to be a constitutional right and a State responsibility in France.

P3.17

Male partners' perceptions of breastfeeding-related roles, services, and supports

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose: A partner's support, or lack thereof, can be a major catalyst or deterrent to breastfeeding initiation and continuation (Freed et al., 1992). Generally speaking, research is limited in the areas of male partners' perceptions about breastfeeding-related experiences, support, and education (Mitchell-Box et al., 2012). In addition, there appear to be gaps in the literature related to the role(s) of the male partner in the family breastfeeding experience. Finally, additional research is needed to identify partners' perceptions of existing breastfeeding services and supports. The purpose of the current prospective study was to examine male partners' perceptions of their role(s), as well as the services and supports used or needed, in relation to the family breastfeeding experience over six months postpartum.

Methods: Sixty male partners ($M_{age} = 31.6$, $SD = 5.5$) of primiparous women who were recruited for a larger breastfeeding project (Smith et al., 2014) participated. Men completed online surveys at three time points which corresponded to infant age: (1) baseline (< 4 weeks), (2) 3 months, and (3) 6 months. Surveys were designed to collect information about perceived breastfeeding-related role(s), supports, and services. SPSS 21 assisted analysis of quantitative data. Qualitative data underwent inductive content analysis assisted by QSR NVivo 10.

Results: At all time points, the majority of participants identified supporting the mother (e.g., verbal encouragement, practical support), caring for the infant (e.g., burping, dressing), and feeding the infant (i.e., expressed milk) as their predominant role(s) in the breastfeeding experience. With regard to supports and services, participants perceived community clinics and family/friend support to be important for the continuation of breastfeeding. While the vast majority of participants indicated that male partner-specific breastfeeding supports or services would not be helpful, some noted that an online or drop-in support group for male partners would have improved their experience. Several participants also expressed the need for education and access to partner-specific information related to breastfeeding.

Conclusions: Findings concerning the use of and need for partner-specific breastfeeding services and resources appear to be mixed. Researchers should consider developing and examining the feasibility of providing evidence-based partner-focused information via frequently accessed family services.

P3.19

Life course influences on food acquisition and preparation strategies among Mexican-origin mothers in New York State

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: To elucidate the influence of life course on recent Mexican-origin immigrant mothers' food acquisition and preparation strategies to feed their family and maintain a food secure household. This project employed a unique approach, including participant-driven photo elicitation interviews, guided by ecological and life course perspectives. Furthermore, participants lived in the northeastern US, an area experiencing recent growth of this at-risk population but lacking context-specific data for intervention design.

Methods: We conducted in-depth semi-structured interviews with low-income Mexican-origin mothers with at least one child <5 years. Key informants, trusted stakeholder organizations, and community events helped to identify eligible mothers. We purposefully sampled mothers residing in 1) the U.S. <5 years vs 6 -10 years, and 2) rural vs urban areas. Mothers completed three in-depth interviews, the second based on photo elicitation, in their preferred language (Spanish or English). Investigators iteratively coded verbatim transcripts, discussed and drew consensus on codes, and identified emergent themes based on the guiding theories and any open codes.

Results/findings: Life course factors that influenced acquisition and preparation strategies included rural versus urban lifestyle in Mexico, food security status in Mexico, timing in the life course of acquired knowledge and skills, adaptations to the food environment with migration, and transitioning into the role of a mother. For example, mothers, especially those from rural origins but currently living in urban areas, adapted to a discrepancy between preferred and actual fresh food access and availability in the US. Mothers relied on these and other food experiences in Mexico to help them prepare meals for their families and maintain a food secure household. Many mothers also avidly sought and embraced new information to inform food preparation.

Conclusions: Findings suggest a Mexican-origin mother's life course, including from where she immigrated and when, influences how she acquires and prepares sufficient, enjoyable meals for her family. Low-income, Mexican-origin mothers with young children are a receptive audience for nutrition education and agricultural programs that take into account both current context and lifestyle in Mexico in order to help maximize household resources to prevent and reduce food insecurity.

P3.21

Sodium Messaging on Food Packages Improves Consumer Understanding of Sodium Levels on the Nutrition Facts Table

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SIG: Yes, Policies and environments

Awards: No

Objective: On average, Canadians consume about 3400 mg of sodium per day, which is well above the Upper Limit of 2300 mg. While Canada's mandatory Nutrition Facts table (NfT) is meant to help consumers make informed choices about the foods they eat, it is known to be confusing to many individuals. The aim of this study was to determine whether consumers can properly classify sodium levels (as low, moderate, or high) based on the NfT alone and whether sodium focused messages can improve these evaluations.

Methods: Participants from a 2012 national online consumer panel (n=3,437) aged 19 years or older were randomly assigned to 1 of 5 treatment conditions on 3 different mock cheese products containing different amounts of sodium (in a 5x3 factorial design). Treatment group 1 was shown a Nutrition Facts table (NfT) with typical levels of sodium and groups 2 to 5 were shown a NfT with a corresponding 25% reduction. Groups 3 to 5 were shown the same NfT as Group 2, but with various additional sodium focused messages (Groups: 3, a "reduced sodium" claim; 4, a "reduced sodium" claim plus "same great taste and texture"; 5, same as 4, but provided with a "Get The Facts" sodium info sheet). Each participant was asked to judge the amount of sodium as being "a little bit," "a moderate amount," or "a lot." Treatment groups were compared by response using independent z-test for percentages (unpooled proportions).

Results: Treatment groups 1 and 2 made similar classification judgements, regardless of whether or not the product was reduced in sodium. By comparison, groups 3 and 4 who were shown a "reduced sodium" claim in addition to the NfT classified products as lower in sodium ($P<0.05$). This effect was even greater when consumers were also shown the sodium info sheet ($P<0.05$).

Conclusions: These results indicate that Canadian consumers have a poor ability to judge what constitutes low, moderate, or high amounts of sodium based on only using the NfT. Sodium focussed messages significantly improve consumers' ability to evaluate sodium levels in food.

P3.38

Using mixed methods to evaluate an intervention to promote well-being and a healthy school day for high school students - the Healthy High Schools study

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Life course models highlight times of transition as the first high school year as possible "windows of susceptibility". Many students develop or continue unhealthy behaviors, such as unhealthy eating habits and a highly sedentary lifestyle. In Denmark few interventions have targeted high school students (age group 16-19) as a setting for promotion of healthy lifestyle and well-being. The purpose is to use mixed methods to develop, implement and evaluate a sustainable high school intervention to promote well-being and a healthy school day among students.

Methods:

Development, implementation and evaluation of the intervention will be guided by the Intervention Mapping protocol. Based on baseline data from a nationwide high school cohort, 60 randomly selected high-risk schools will be randomized into intervention- and control groups. Data will be collected at the beginning (age: 16) and end of high school (Age: 19). The effect of the intervention will be evaluated using cluster randomized controlled design with self-reported and objective baseline and follow-up measures in intervention and control schools. The implementation of the intervention will be evaluated by a qualitative and quantitative process evaluation.

Results:

Based on focus groups with high school students, interviews with teachers and existing literature we found that many students are feeling stressed, lack adequate sleep, spend most of their day sedentary and have unhealthy eating habits. The needs assessment indicated that the intervention should focus on improving sleep, eating & meal habits, physical activity, and on reducing stress and time spent sedentary.

Conclusions:

This project will provide insights on effective strategies tailored for high schools to promote well-being and a healthy school day and well-being among high school students. The needs assessment indicated that the intervention should focus on improving sleep, eating & meal habits, physical activity, and on reducing stress and time spent in sedentary behavior to improve well-being and a healthy school day.

P3.39

Bridging connections and building relationships: The role of knowledge translation and exchange in comprehensive school health research

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Comprehensive school health (CSH, also known as health promoting schools) is recognized globally as being effective in supporting physical activity and healthy eating among children and youth. CSH is achieved through a multifaceted approach involving curriculum, supportive environment and school policies with support from the whole school community. Research in Nova Scotia (Canada) is investigating how implementation of CSH impacts school culture and student well-being. The purpose of this presentation will be to illustrate how knowledge translation and exchange (KTE) facilitated interaction between researchers and knowledge users (KU) and supported CSH implementation.

Methods: Our population-based study included students in grades 4-6 (about 9-12 years old) and their parents across 18 schools in a rural school board (10 schools have adopted a CSH approach and the remaining 8 were considered comparison schools). We used a multi-method, iterative process to identify school policies, processes and built environmental characteristics that contribute to school and student well-being by integrating empirical and tacit knowledge. KU, including various levels of public sector (i.e., government, health authority and school board), were engaged in the development of research tools to ensure measures were reflective of their needs.

Results:

We collected information on students' diet, physical activity and well-being and school culture through surveys with students, parents, school leaders and teachers and an audit of the school environment. Results were shared with KU through interactive sessions and individualized school reports based on the priorities identified by KU. Schools are using their results to help inform their yearly plans to create healthier school environments. Additional research is ongoing to support emerging research questions identified by KU. Dissemination activities also include publications, conference presentations (i.e., ISBNPA) and networking with researchers and practitioners globally to expand issues that relate to KTE in school-based interventions.

Conclusions: Our research provides insight to the impact of CSH implementation on school culture and student well-being and the importance of integrating KTE in research. Ongoing exchange between researchers and KU ensured integration of relevant results to inform practice changes in schools, policy development for the school board and transferable knowledge for other jurisdictions.

P3.40

The Amsterdam school environment from the child perspective

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: School can offer many opportunities for children to be physically active. However, recent numbers demonstrate that children only spent a small amount of their school time in physical activity. Remarkably, the perspectives of children, i.e. the primary users, on the activity-friendliness of their playground are lacking in studies aimed at increasing physical activity at school. We aimed to examine child-identified determinants of physical activity at school playgrounds.

Methods: We conducted a participatory child research with children as co-researchers. At each of the three participating schools, six motivated boys and girls were selected and joined six-to-eight group meetings. With an experienced researcher as facilitator, children discussed their perceptions of their school playground using different methods such as explorative walk, drawings and peer-interviews. Data analysis was partly integrated in the process as children evaluated and presented (to a self-selected audience) their findings at the end of the project. The researcher enriched the data by making coding schemes from written reports, field notes and observation reports and clustering of related themes.

Results: Children have a large wish to play (i.e. child wording of being physically active), but only if this playing is fun. There are different aspects that can impair children's fun playing: (1) physical environment (e.g. dirt/litter, few equipment); (2) physical safety (e.g. lack of soft surface, poor condition equipment); (3) too many rules that are unclear to children (e.g. only allowed to play with a ball at the soccer field); (4) lack of positive and/or presence of negative social interaction; and (5) boredom (e.g. when playing the same games at the same playground over multiple years).

Conclusions: This study indicates that children have good and realistic ideas to increase their physical activity (i.e. playing) at the playground, and reveal aspects that are easily overlooked by adults.

P3.41

Facilitators and barriers to engagement in parenting programmes: a qualitative systematic review

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SIG: Yes, Children and families

Awards: No

Purpose: To determine the barriers and facilitators to parental engagement in parenting programmes we completed a systematic review of qualitative studies where parents were asked why they choose to commence or complete parenting programmes designed to support their parenting practices. Previous research on this topic has largely focused on the perspectives of providers, policy makers or researchers. Therefore we compared parent's perceptions with those of researchers.

Methods: We searched for studies published in English meeting the following criteria: Participants included parents eligible to participate in programmes, people delivering programmes, or researchers evaluating programmes; Interventions included programmes defined by the author as a parenting intervention and run by trained facilitators; Outcomes included features of programmes that resulted in engagement and/or retention of parents; and Studies included qualitative methods used within a range of study designs. No date or language restrictions were applied. A highly sensitive search strategy designed in Medline was adapted for use in ten other electronic databases. Citations were imported into EPPI-reviewer data management software. A combination of traditional title and abstract searching methods and text mining technology was used to identify included studies. Data were extracted by two reviewers and risk of bias was assessed against published criteria. Barriers and facilitators to parental engagement in parenting programmes were analysed and collated through framework synthesis.

Results: The electronic database search identified 16513 citations, 12,249 of which were unduplicated. Title and abstract screening and text mining using automatic term recognition yielded 15 papers reporting parent's perspectives and 9 reporting perspectives of researchers or deliverers. One study reported both parents and researchers/deliverer's perspectives. Framework synthesis identified six facilitator and five barrier themes as important influences on participation with a total of 33 sub-themes. Participants focused on the opportunity to learn new skills, working with trusted people and in known settings. Researchers and deliverers focused on tailoring the programme to individuals and staff training.

Conclusions: Parents and researchers / deliverers differed in their opinions of the most important features of programmes that act as facilitators and barriers to engagement and retention. Programme developers should consider both perspectives when designing and evaluating programmes.

P3.42

Feasibility Study - The evaluation of the PhunkyFoods Programme

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

Within schools there is a need for easily implemented interventions designed to promote healthy lifestyles through encouraging a healthier balanced diet and to increase children's physical activity. The PhunkyFoods programme (PFP), underpinned by the whole school approach is a nutrition and physical activity education intervention aimed at improving health related knowledge and behaviours in children. This study aimed to assess: the feasibility, acceptability and delivery of the PFP intervention; appropriateness of outcomes and outcome measures; recruitment, and retention.

Methods:

A cluster randomised feasibility trial consisting of eight primary schools (4 Intervention and 4 Control) in the North of England with a total of 311 pupils (175 boys; 183 girls) aged 6-9 years old). The following validated tools used at baseline, 6 months and 18 months were; anthropometric measurement, a Healthy Lifestyle Knowledge Questionnaire (HLKQ), dietary intake and physical activity using the Synchronised Nutrition and Activity Program (SNAPTM), and psychological well-being to assess intervention effect of dieting behaviours; body image; self-perceptions.

Results:

At 6 months a total of 337 (94.1%) of the original pupils remained in the trial, and this decreased to 325 (90.8%) at 18 months. There was no difference between the two groups for total knowledge score, however, for Year 4 pupils there was a statistically significant, higher mean healthy balance score from the HLKQ (mean difference 5.1, 95%CI 0.1-10.1, p=0.05). The SNAP tool identified a possible trend towards Year 2 Intervention pupils consuming fewer fizzy drinks, chocolates, sweets, biscuits and cakes compared to Control group pupils. Year 4 Intervention pupils reported higher fruit consumption at 18 months compared to the Control pupils. However, a fully powered randomised controlled trial is needed to determine if these differences are statistically significant. There was no evidence that the intervention had any detrimental effect on the psychological well-being of the Intervention school pupils.

Conclusion:

The results support the future implementation of a randomised controlled trial to evaluate the effectiveness of the PFP. Teachers found PFP to be a highly acceptable programme for teaching children about nutrition and physical activity which could possibly help tackle poor nutrition and sedentary behaviour in children.

P3.43

Lifestyles, nutritional status and lipid profile of undergraduates in a Nigerian University of Agriculture

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: To measure the lipid fractions in serum blood samples of apparently healthy undergraduates of Michael Okpara University of Agriculture, Umudike as well as assess their lifestyles and nutritional status.

Methods: A total of one hundred (100) consenting males and females aged between 19-30 years were purposively selected from undergraduates of the university. A structured and validated questionnaire was used to elicit information on the socioeconomic status, lifestyles and dietary habits. Anthropometric measurements (weight, height, waist and hip circumference) of the subjects were measured while Body mass Index (BMI) and waist hip ratio (WHR) were calculated. Serum lipid profile; total cholesterol (TC), triglycerides (TRG), high density lipoprotein (HDL-C) and low density lipoprotein (LDL-C) cholesterol were measured. Data were analyzed using descriptives, t-test, Chi square and Pearson correlation.

Results: The prevalence of overweight and obesity were 32% and 6%, respectively while 20% had high WHR. Sedentary lifestyle was found in 48% of the study participants. Consumption of pastries/ carbonated drinks and alcohol more than thrice a week was found in 48% and 52% of the subjects, respectively. High levels of TC (56%), increased LDL-C (92%) and HDL-C (96%) were found in the undergraduates; however, all subjects had desirable levels of TRG. Total cholesterol (TC) correlated with weight ($r=0.437$); waist circumference ($r=0.437$); BMI ($r=0.401$) ($p<0.05$).

Conclusion: The study revealed the subjects were overweight and had abnormal lipid profile. There is need for lipid profile evaluation as part of the orientation programs for undergraduates as well as nutrition education in order to promote healthy lifestyles.

P3.44

Shaping the direction of youth health: The COMPASS study

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SIG: Yes, Policies and environments

Awards: No

Objective: A challenge that inhibits successful population prevention is generating robust information on the health of the population and effectively translating that evidence to support action in a timely fashion. To address this challenge, we must strengthen the feedback loop between the researchers that generate new evidence and the public health system stakeholders that are responsible for implementing prevention action. The primary objective of COMPASS is to address that need within school-based prevention programming.

Methods: COMPASS is a prospective cohort study designed to annually collect hierarchical longitudinal data from a sample of 89 secondary schools and the 50,000+ grade 9 to 12 students attending those schools in Ontario and Alberta (Canada). COMPASS uses a rigorous quasi-experimental design to evaluate how changes in school programs, policies, and/or built environment characteristics are related to changes in multiple youth health behaviours and outcomes (e.g., obesity, healthy diet, physical activity, sedentary behaviour, substance use, and bullying) over time.

Results: These data will allow for the quasi-experimental evaluation of natural experiments that will occur within schools over the course of COMPASS, providing a means for generating "practice based evidence" in school-based prevention programming. In order to ensure that the COMPASS resources and infrastructure have impact and provide the largest scientific contribution possible, we are actively recruiting additional trainees and investigators from across Canada and internationally to become engaged in COMPASS by sharing the data. To foster such engagement, we have a COMPASS Data Usage Application on the COMPASS website (www.compass.uwaterloo.ca) as a means for individuals or groups to request access to the COMPASS data.

Conclusion: COMPASS is the first study with the infrastructure to robustly evaluate the impact that changes in multiple school-level programs, policies, and built environment characteristics within or surrounding a school might have on multiple youth health behaviours or outcomes over time. COMPASS will provide valuable new insight for planning, tailoring and targeting of school-based prevention initiatives where they are most likely to have impact.

P3.45

The Diet and Physical Activity Networks of College-Aged Adults

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: This study examined the composition of diet and physical activity networks among college students. Little is known about social network composition and influence among college-aged adults, although this population potentially faces many social and lifestyle changes.

Methods: Data came from 40 students attending the University of Hawaii. Participants reported on daily diet and physical activity behaviors (e.g., grocery shopping, cooking, eating out, exercise participation) and who encouraged them to eat healthy and be active. They also rated each nominee's influence on behaviors (1 = *not at all*, 10 = *greatly influences*). The number of nominations and mean influence of networks labeled as family, college friends, high school friends, significant other, and "other" were assessed.

Results: Diet networks primarily included family, significant others, and college friends, with college friends perceived as having the least influence. Encouragement to eat healthy also came primarily from these groups, with significant others perceived as most influential

($M(SD) = 8(2.5)$). College friends (40% of nominations) were less influential on participants' exercise participation ($M(SD) = 3.5(2.2)$) compared to high school friends (12% of nominations, $M(SD) = 7(2.8)$). High school friends (9% of nominations) were perceived as influential in encouraging participants to be active ($M(SD) = 6.6(2.9)$) as was the "other" group (19% of nominations, $M(SD) = 7.9(1.6)$). "Others" included coaches, doctors, trainers, and friends outside of school. Given concerns about physical activity rates among females, we looked at exercise networks by sex. High school friends made up 20% of nominations by males and 6% of nominations by females. The "other" group made up 19% of nominations by females with no nominations by males.

Conclusions: High school friends and "others" were perceived as influential for physical activity while family and significant others were perceived as influential for diet. The social context of eating and food preparation and the early establishment of exercise norms, particularly for males, may have contributed to our results. Our findings suggest that understanding how small but influential networks impact behavior may help tailor physical activity interventions by gender. In addition, diet interventions involving significant others and family may be more effective.

P3.47

Designing a smartphone application for women with gestational diabetes mellitus followed-up at diabetes outpatient clinics in Norway

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Objective: To document the process of designing a smartphone application (the Gravid+ app) to easily register blood sugar levels and to provide tailored information about healthy eating and physical activity for women with GDM receiving health care at outpatient clinics in the area of Oslo, Norway.

The prevalence of gestational diabetes mellitus (GDM) is increasing worldwide. Controlling blood sugar levels, accompanied by a healthy diet and physical activity, is fundamental to the treatment of GDM. Currently, patients register their blood sugar levels in a leaflet and receive verbal or written health information at the clinics. The increased use of smartphones may provide the opportunity for tailored and easily available health information.

Methods: This formative research included expert group discussions among health professionals, software development professionals and researchers in nutrition, physical activity, obstetrics and midwifery. Individual interviews with patients ($n=10$) were conducted to discuss the prototype of the app. The final app will be tested in a randomized controlled trial at five clinics.

Results: Preliminary results from the expert group discussions outline the importance to tailor the information in the app towards the users' blood sugar levels, food culture, physical activity level and motivation for behaviour change. A cross-platform app was developed with standardized web application interfaces. This approach allowed to extend the app dynamically in terms of content and to tailor the information towards different users. Users perceived the app as useful and easy tool to monitor their blood sugar levels. They asked for more information about the health consequences of GDM, how to eat healthy and the avoidance of jargon.

Conclusions: Involving both expert groups and patients is important when designing an app that is aimed to be a part of the health care at the clinics. Behaviour change techniques such as self-monitoring, perceived severity and benefits, as well as cues of action will be included before testing the app in a randomized controlled trial at the outpatient clinics.

P3.48

How to engage people in physical activity, sedentary behaviour and dietary change through existing allegiances and loyalty to community-based organisations: a scoping review

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: There is increasing evidence of what makes lifestyle change programmes effective, but much less about how to attract people to them and keep them engaged. Some programmes, particularly those based in sporting venues, can attract groups who do not usually participate, and existing allegiance or loyalty to the sports club appear to be an important draw. However, little is known about how to systematically exploit concepts of 'allegiance' or 'loyalty' to support behaviour change. We conducted a scoping review to identify current good practice in engaging people in lifestyle change (physical activity, sedentary behaviour, diet) through existing allegiances to community-based organisations.

Methods: We searched seven databases using terms describing intervention type, study type, and membership- or supporter-based community organisations. Full texts were included if programmes they described: were set in or worked with community-based organisations; involved the development, delivery and/or evaluation of an intervention that aimed to support PA/SB/dietary improvement; used existing loyalties/allegiances to recruit to, or as part of, the intervention. Extracted data, which included the authors' and our own interpretations of how 'allegiance' and 'loyalty' were used to engage participants, were analyzed thematically.

Results/findings: We screened 7783 titles, 568 abstracts and 159 full papers: 62 papers met our inclusion criteria, describing 37 interventions in churches, football clubs, rugby clubs, veteran's organisations and rotary clubs. Few authors focused on what it was about the programmes or setting which engaged participants; almost all focused only on effectiveness. Our analysis showed five ways in which loyalty and/or allegiance was harnessed by programme developers: a) membership or fan bases were used as a pool of potential recruits; b) existing members were involved in delivery; c) social support between members was encouraged; d) programme content was informed by the ethos of the organisation or by existing social practices; e) existing trusted relationships were used to endorse the programme.

Conclusions: Programmes to support healthy lifestyles designed to be delivered through community organisations could consider the inclusion of these 5 approaches. Increased discussion of the rationale for using community-based organisations to promote lifestyle change would better allow identification of good practice.

P3.49

School Obesity-Prevention Policy Efforts in Minnesota and Student Outcomes: A Longitudinal Cohort Study

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SIG: Yes, Policies and environments

Awards: No

Objective: The School Obesity-related Policy Evaluation Study (SCOPE Study) uses existing public surveillance data and applies a rigorous study design to evaluate the effectiveness of school policies and practices impacting student behavioral and weight outcomes. The objectives of this study are to evaluate the effect of school nutrition and physical activity policies on the weight and weight-related behaviors of students.

Methods: The SCOPE Study used a cohort of 50 junior-senior high and high schools in Minnesota (USA) to evaluate the change in weight-related policy environments in 2006 and 2012 and test the effect of policy change on students attending those schools in 2007 and 2013.

School policies about the food and beverages available in school vending machines and school stores, physical education requirements, and intramural opportunities, as measured by the School Health Profiles, a state surveillance instrument administered by the Centers for Disease Control and Prevention to school principals. Primary outcomes for this study are average school-level student body mass index percentile, obesity prevalence, daily servings of fruits/vegetables and daily glasses of soda. These variables were assessed using the Minnesota Student Survey, a voluntary, self-report state surveillance instrument administered to students every 3 years.

Results: Availability of fruits/vegetables in schools significantly increases total daily intake among all 9th grade students by 0.4 servings. Availability of soda in schools significantly increases total daily intake among 9th grade boys by 0.5 servings. As less healthy snacks and drinks are available in schools there is a small, significant, negative effect (1%) upon student BMI percentile. There were no differential policy effects by sex.

Conclusions: The SCOPE Study provides evidence that school policies and practices, especially policies that restrict vending and school store offerings, may be effective for improving nutrition behaviors and weight status among 9th grade students. This study's findings suggest that the relative decrease in obesity may be associated with the cumulative effect of several policies rather than a single policy. The time required to achieve measurable effects and resultant small effects suggests that there is more room for improvement in addressing childhood obesity both in school and out of school settings.

P3.50

"I Didn't Want to Fail Myself": Explaining Participation In A Community-Based Healthy Lifestyle Programme

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

Developing and implementing health promotion programmes is challenging at all levels particularly at the community level where the majority of programmes take place. This can stem from lack of programme awareness or being uncomfortable in an unfamiliar setting. Additional insight is required to understand how health programmes can enhance engagement and behaviour change. Fans4Life is a 10 week healthy lifestyle programme delivered in a professional football club broken down into one hour sessions focusing on health checks, dietary health, physical activity, heart health, alcohol, mental health and well-being, and interactions with health experts. The purpose of this poster is to investigate the impact of Fans4Life on participants' physical activity, health behaviours, and mental health and well-being.

Methods:

A qualitative research design utilizing inductive content analysis was used to explore the data. Semi-structured telephone interviews using open-ended questions were conducted with programme completers (n = 7). Questions focused on engagement, behaviour change, and well-being. Participants were recruited purposively via email invitation. Interviews were recorded and transcribed verbatim. Data were initially coded into a series of text units providing general themes before more detailed subthemes were derived through a process of constant comparison.

Results/Findings:

The overarching theme re-empowering emerged through data analysis which was characterised by three core subthemes of education, social interaction, and social support. Within a context of a professional sports club setting, additional subthemes included facilitators and barriers which highlighted factors that supported or hindered the re-empowering process. Re-empowering led to positive behaviour changes both for the individuals and their families. These changes included dietary habits, physical activity, health literacy, mood, energy levels, efficacy, and alcohol consumption.

Conclusion:

Participation in the Fans4Life programme leads to a process of re-empowering with multifaceted health outcomes. Critical to re-empowering are a familiar environment, loyalty to a club, social connectivity, and targeted advertising. Participants indicated positive behaviour and well-being changes and increased health literacy with secondary effects for family members. Future community-based health promotion programmes would benefit from including a holistic health approach and utilizing familiar assets, such as a professional sports club, within a local area.

P3.51

Development of a culturally adapted weight management programme for children of Pakistani and Bangladeshi origin: The CHANGE study

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose: The prevalence of childhood overweight/obesity in England is 34% in 10-11 year olds, and is forecast to continue rising. South Asian children have a higher prevalence of obesity compared to white children (23% vs. 18% in 10-11 year olds). South Asians are also more vulnerable to the cardiometabolic consequences of obesity both in childhood and adulthood. Birmingham (UK) is a culturally diverse city with 20% of children from Bangladeshi and Pakistani (BP) communities. The city offers a 7-week community weight management programme to parents of overweight/obese children aged 4-11 years (First Steps). Initial uptake of the programme by BP families is high, but completion rates are lower than average. The Child weight mANaGement for Ethnically diverse communities (CHANGE) study aims to adapt the current programme to make it more culturally suited to BP families. A qualitative study with BP parents who have experience of the weight management programme will provide the main data for programme adaptation.

Methods: We are currently recruiting BP parents to participate in interviews and focus groups to explore barriers and facilitators to participation in the existing programme and potential modifications to enhance participation and sustained engagement. We are inviting BP parents (n=30) who either declined to attend, or did not complete the First Steps programme to be interviewed, and parents (n=20) who completed First Steps to participate in focus groups. The interviews and focus groups are being undertaken by trained BP community members in the participants' preferred languages. A systematic and iterative approach to data analysis will be undertaken, based on the constant comparative method. The resulting data, together with an evidence review of effective children's weight management strategies, will inform the programme adaptation process. The framework for adaptation of health promotion programmes for minority ethnic groups developed by Liu and colleagues will guide the process.

Findings: We will report the findings from the qualitative study and describe how these have informed the process of adaptation of the children's weight management programme.

Conclusions: Key messages relating to cultural adaptation of weight management programmes and other health promotion programmes will be discussed.

P3.52

An Examination of Eating and Physical Activity Identities

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective: Self-identities shape health perceptions and behaviors. Understanding intersections between diet and exercise identities may aid obesity prevention efforts. This study examined the factor validity of a version of the Eating Identity Type Inventory (EITI), clustering of eating identity types, and associations between clusters and dietary behaviors as well as athlete identity dimensions.

Methods: Data were collected from 40 students at the University of Hawaii (33% Asian American, 30% mixed ethnicity; 65% female; M_{age} (SD) = 25.4(7.9)). Participants completed the EITI and the Athlete Identity Questionnaire (AIQ), a measure of athletic identity that encompasses exercise, sports, and physical activity participation. Principle component analysis with a varimax rotation was used to determine the factor structure of data collected using the EITI. Internal consistency of EITI type and AIQ dimension (appearance, importance, competence, encouragement) scales were assessed with Cronbach's alpha. Hierarchical cluster analysis was used to examine clustering of eating identity types. Means for fat, fruit and vegetable intake, and AIQ dimensions were compared across clusters.

Results: A 7 factor solution emerged and included: healthy, glutton overeater, emotional overeater, picky, adventurous, vegetarian, and meat eater. Internal consistency ranged from 0.69-0.88 for these scales and from 0.86-0.93 for the AIQ scales. The 5 eating identity clusters were: picky eaters; meat eaters; healthy and vegetarian (healthy vegetarians); both overeater types and adventurous (overeaters); adventurous, meat, and healthy (moderate eaters). Fat intake was highest among meat eaters and fruit and vegetable intake was highest among healthy vegetarians. Encouragement was highest among overeater and picky eaters, competence among meat eaters, importance among healthy vegetarians, and appearance among moderate eaters.

Conclusions: Findings support previous qualitative findings of eating identity type intersections as well as previous work indicating healthier eating identities are associated with better dietary behaviors. Healthy vegetarians had higher scores for athletic importance, the dimension correlated with better physical activity behaviors. The other eating identity clusters were associated with different athlete identity dimensions suggesting different eating profiles may benefit from tailored diet and physical activity materials as part of obesity prevention interventions. Additional examinations of the identity intersections and relationships with behaviors and behavior change is needed.

P3.53

Meeting the challenges of organizational recruitment in family child care homes: the KEYS Project

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SIG: Yes, Early care and education

Awards: No

Objective: To describe strategies to improve organizational recruitment of family child care homes into a randomized intervention study to improve children's diet quality and physical activity

Methods: Recruitment strategies were developed prior to trial implementation using researchers' experiences with child care centers and parents of preschool-aged children. Power calculation estimates for the two primary outcomes (children's diet quality and physical activity) suggested a sample of 150 family homes (75 intervention + 75 control) with an average of 3 children (1.5-4 years old) per home (n = 450 children). Because of this large target, four to five waves (or cohorts) of 30-40 homes each would be needed. Low enrollment, particularly after wave 2, prompted revisions and enhancements to recruitment strategies. After an all-day retreat with investigators and major personnel, adjustment to recruitment strategies included: 1) enhanced engagement of community partners working with family child care home providers; 2) in-person delivery and pick up (vs. mailed) of study information; 3) redesign of recruitment materials making them more user-friendly; 4) refined phone script with more detailed information on study benefits and demands; and 5) display posters for the family homes to facilitate parent information.

Results: During waves 1 and 2, 207 and 212 homes were successfully contacted and screened (76% and 70% of the recruitment pool). Of those, 36% of wave 1 and 28% of wave 2 were identified as eligible and interested. Capture (enrollment and measurement) of eligible and interested homes was lower than expected, 41% in wave 1 and 31% in wave 2. Following implementation of the modified recruitment strategies, 196 and 296 homes were successfully contacted and screened in waves 3 and 4 (76% and 48% of the recruitment pool), respectively. Of those, 27% of wave 3 and 29% of wave 4 were identified as eligible and interested. Capture of eligible and interested increased to 51% and 55%, respectively.

Conclusions: Organizational recruitment of family child care home providers is challenging, due in part to the intimate nature of the setting (provider's own home). Use of community agents and person-centered strategies can improve recruitment.

P3.54

Evaluating the Effectiveness of a Youth Peer-education Intervention for Increasing Physical Activity and Consumption of Fresh Fruits and Vegetables

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: The purpose of this intervention is to evaluate the effectiveness of community programs employing positive youth development strategies such as peer education, role modeling for other youth, and supporting positive behavioral changes among group members to influence outcomes associated with nutrition, physical activity, and leadership among participating youth.

Methods: Students form 4-H Healthy Living Ambassador clubs at participating high schools through which students receive training in nutrition, physical activity, and leadership. Program participants disseminate what they have learned through health fairs at their schools and other special community events such as harvest festivals and county fairs. Data are collected through pre/post survey instruments administered at the beginning and again at the end of the school year. Measures employed include the Self-efficacy for Healthy Eating scale, the Dietary Behavior and Physical Activity scales from the National Youth Risk Behavior Survey, and the Competence for Civic Action scale.

Results: 105 students from four high schools (3 urban, 1 rural), located in the southwestern United States, participated in this program evaluation. Three-quarters of the program participants identify as Hispanic and approximately 75% of program participants are below the U.S. poverty level. Results show significant changes in the desired direction in several outcome areas. Students reported increased consumption of fruits from approximately 4-6 times during the past 7 days to approximately 1 time per day during the past 7 days ($p < .05, n = 41$) and increased consumption of carrots from approximately 1-3 times during the past 7 days to approximately 4-6 times over the past 7 days ($p < .05, n = 41$). Reports of sedentary activity decreased in the desired direction with 12% of students reporting screen time of four hours or more per day at pre-survey and only 3% reporting the same amount of screen time at post-survey ($N = 105$).

Conclusions: This evaluation provides some limited, although useful, evidence that principles of positive youth development, including peer education and leadership, can be employed in school settings to affect change in sedentary behaviors and improved diet. Program evaluations such as the one represented in this poster show how research can be translated into practical applications to meet community needs.

P3.55

'You are what you choose to eat' Factors influencing young adults' food purchasing behaviour

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Objective: Data from high income countries consistently shows greater weight gain in young adults born in the last few decades, coinciding with the development of modern obesogenic environments saturated with cheap, highly palatable, processed foods. While intervening in the immediate food environments of young adults is indicated, little is known about factors influencing their food purchasing. This study aimed to measure the importance of different influences on young adults' food purchasing, and examine whether these influences differ according to adiposity or related lifestyle behaviours.

Methods: Cross-sectional survey of young adults aged 19-24 years ($N = 112$, 38% male). Survey items assessed demographics, adiposity-related lifestyle behaviours (dieting and physical activity), and perceived importance of different influences on food purchasing behaviour. Adiposity indicators (body mass index and waist circumference) were measured by trained dietetic research students. Non-parametric Mann-Whitney U and Kruskal-Wallis tests compared participants' perceived importance of different influences on their food purchasing by adiposity status, physical activity level and dieting behaviour.

Results: Taste had the most important influence on food purchasing, followed by convenience, cost, nutrition or health value, and other sensory (smell) and functional (stimulatory) properties. Participants with an elevated waist circumference (> 94 cm in males, > 80 cm in females) placed greater importance on purchasing foods to help them cope with stress ($P = 0.001$) and control their weight ($P = 0.021$). Those reporting a high level of physical activity (i.e. daily activity in the last week totalling ≥ 3000 MET-minutes) placed greater importance on the nutritional ($P = 0.008$) and health ($P = 0.049$) value of foods, but less importance on taste ($P = 0.001$). Similarly, dieters placed less importance on taste ($P = 0.049$) as well as value for money ($P = 0.023$), but greater importance on helping them control their weight ($P = 0.021$), making them feel good ($P = 0.010$) and nutritional value ($P = 0.003$).

Conclusions: This study supports health promotion strategies ensuring the ready availability of tasty, cheap, nutritious foods in young adults' immediate food environments, although some tailoring of strategies is indicated for specific health or weight-conscious sub-groups.

P3.56

Breaking the 'active couch potato' phenomenon among cardiac patients attending a Phase II cardiac rehabilitation program: a pilot, two-arm randomized controlled trial

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Aim: To test the feasibility and effectiveness of a new behavioral theory-based intervention to reduce sedentary behaviour outside the clinic in participants attending a Phase II cardiac rehabilitation programme.

Methods: A Randomized Controlled Trial (ACTRN12614000279628) is being currently conducted. We attempt to recruit 50 cardiac patients attending to a phase II cardiac rehabilitation program (25 Intervention group and 25 Control group). The intervention is conducted during the 12-week phase cardiac rehabilitation program period. The intervention consists of 3 educational sessions, which are held during weeks 2, 5 and 9 of the cardiac programme. The behavioral intervention is delivered individually based on each participant's baseline assessment of sedentary behaviour outside the clinics. Primary outcome measures are physical activity and sedentary behaviour outside the clinics hours. Secondary outcomes are cardio-metabolic health, health-related quality of life, exercise capacity, self-efficacy, and anxiety and depression. Here we present some preliminary data on the effects of the behavioral intervention in the time spent in sedentary behaviour, including the average time per day (h/d), and different domains [transport(h/d), screen time(h/d), TV time (h/d) and breaks during TV time (number)].

Results: To date, we have data on 2 participants at week 5. Participant A has reduced his sedentary time per day by 5 hours, his screen sedentary time per day by 2.5 hours, his transport sedentary time by 0.4 hours, and his TV viewing by 1 hour. He also increased the number of breaks in sedentary time during TV viewing by 4. Participant B has reduced his sedentary time per day by 4 hours, his screen sedentary time per day by 1 hour, his transport sedentary time by 0.4 hours, and his TV viewing by 1.5 hours. He also increased the number of breaks in sedentary time during TV viewing by 5.

Conclusions: The preliminary results suggest that the intervention works toward reducing sedentary behaviour in different domains among cardiac patients attending a Phase II cardiac rehabilitation program.

P3.57

Improvements in weight, fitness and dietary outcomes following lifestyle intervention: the type 2 diabetes mellitus PULSE Program randomised controlled trial for men

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: To evaluate the efficacy of the type 2 diabetes mellitus (T2DM) *PULSE Program* (Prevention Using LifeStyle Education) - a self-administered, gender-tailored lifestyle intervention for men.

Methods: A 6-month assessor-blinded, parallel-group, randomised controlled trial was conducted. Eligible men were aged 18-65 years, overweight/obese (BMI 25-40 kg.m⁻²) and at high-risk for T2DM (Australian T2DM Risk Assessment Tool). After baseline assessments, men were individually randomised (stratified by age and BMI) to the intervention (n=53) or wait-list control (n=48) groups. The intervention group received the *PULSE Program*, which contained print and video resources on weight loss (*SHED-IT Weight Loss Program*), diet and exercise for T2DM prevention. Men also received a home-based aerobic and resistance training program. The intervention was grounded in Social Cognitive Theory and tailored for men. The wait-list control group received no intervention for six months. Assessments were conducted at baseline, three and six months (primary time point). Outcome measures included: weight (primary outcome), HbA_{1c}, aerobic fitness (Ebbeling treadmill test), lower body muscular fitness (squat-to-box), physical activity (pedometers) and dietary intake (Australian Eating Survey). Generalised linear mixed models (intention-to-treat) were used to determine significant (P<0.05) group-by-time interactions.

Results: Baseline characteristics (mean ± SD) were: age (52.3 ± 9.7 years), weight (103.03 ± 13.10 kg) and HbA_{1c} (5.8 ± 0.5%). The majority of men were Australian born Caucasians (89%). Group-by-time differences at six months (mean [95% CI]) favoured the intervention group for weight (-5.50 kg [-7.40, -3.61], P<0.001, Cohen's d=0.42), HbA_{1c} (-0.2% [-0.3, -0.1], P=0.002, d=0.41), estimated VO_{2max} (3.43 mL.kg⁻¹.min⁻¹ [0.73, 6.13], P=0.013, d=0.51), lower body muscular fitness (17 repetitions [9, 25], P<0.001, d=0.74) and percentage of total energy (E%) from fruit (2.3% [0.4, 4.3], P=0.020, d=0.57) compared to controls. Physical activity (697 steps.day⁻¹ [-321, 1715], P=0.177, d=0.27), total energy intake (-1285 kJ.day⁻¹ [-2734, 165], P=0.082, d=0.38) and E% from vegetables (0.8% [-0.9, 2.6], P=0.349, d=0.22) did not differ between groups, despite significant intervention group improvements.

Conclusions: This study demonstrates the efficacy of a self-administered, gender-tailored lifestyle intervention for reducing T2DM risk factors in Caucasian men. Future research should evaluate the effectiveness of the *PULSE Program* when translated into community settings.

P3.58

Risk of Eating Disorders among Elite Young Athletes in Taipei

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Background:

Eating disorders are psychological illnesses defined by abnormal eating habits and commonly exist among athletes. Clinical symptoms of eating disorders are weakness, fatigue, weight loss, decreased bone mineral density, amenorrhoea/oligomenorrhoea in women, and failure of growth. Those symptoms may reduce performance and increase injuries in athletes.

Objective:

To assess the risk of eating disorders in young athletes in Taipei and compare the differences of eating behaviors between gender.

Methods:

We reviewed the medical charts of elite young athletes selected from National High School Athletic Games in Taiwan and had participated in sports clinics at Taipei Sports Health Management Centre in 2013. Anthropometric data (height, weight, body mass index and body fat percentage) and the Eating Attitudes Test (EAT-26) questionnaire were collected and analyzed.

Results:

156 boy (16.6±1.6 y) and 118 girl athletes (16.6±1.5 y) were included in this study. Body mass index were 21.8±3.1 and 22.1±3.1 kg/m², while body fat percentage were 12.5±5.2 and 23.3±6.1% respectively. According to the results of EAT-26, 4.3% boy and 8.2% girl athletes were at high risk of eating disorders but no significant difference between genders. To divide EAT-26 into three subscales: 1) Dieting, 2) Bulimia and Food Preoccupation and 3) Oral Control, the scores of Dieting and Oral Control in girl athletes were significantly higher than boys (Dieting: 9.7±7.1, 7.4±6.7, p<0.000; Oral Control: 1.0±2.1, 0.6±1.4, p=0.014). However, boy athletes had significantly higher score in Bulimia and Food Preoccupation subscale than girls (2.8±3.2, 2.0±2.2, p=0.008). Among 16 athletes who were at high risk of eating disorders, only one girl athletes was under the normal ranges of both body mass index and body fat percentage.

Conclusions:

The study indicated that more elite girl athletes in Taipei have appeared high risk of eating disorders than boy athletes. However, the abnormalities of eating behavior in all young athletes still should be concerned.

Keywords: young athlete, body mass index, body fat, eating disorders, EAT-26

P3.59

Changing Adolescent Health Behaviours: empirical evidence and practical ways forward

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective:

Adolescents are a key target for health intervention programmes. However, tweens and teens are notoriously difficult to reach. This paper discusses what we might consider when designing more effective interventions in the future. Coming from an ethical and philosophical perspective, the paper draws on empirical research to suggest that, rather than focussing on particular health behaviours, interventions ought to focus on adolescent self-understanding and decision-making, and the interrelations between adolescents and their social context.

Methods:

This paper draws on empirical studies and meta-analyses to identify the characteristics of successful interventions, models from developmental and health psychology, research into positive youth development, and philosophical insights in the areas of value formation and autonomy development.

Results:

There are many influences on adolescents that mean that health considerations are unlikely to weigh heavily in their decisions: the invisibility of future health, adolescents' interactions with others and their environment, their social practices, and their own attitudes and feelings. Adolescents prioritise many things over health, for example, worries about fitting in, and finding oneself. They operate within systems of consumerist norms, in the grip of marketing and a culture of branded goods. They have heightened body image, increased self-consciousness and a desire to make autonomous choices. Parental influence gives way to the influence of peer networks. All of these factors are often bound up with increased risk-taking behaviour.

Adolescence is therefore a distinctive part of development that requires specific intervention design strategies. The paper argues that an ecological approach enables a deeper understanding of the challenges that intervention designers face, and suggests ways to improve intervention strategies. In particular, programmes that enhance personal and social skills may have a positive effect on adolescents' lives, their self-perceptions and social behaviours, and reduce problem behaviours.

Conclusions:

Consideration of the complex interrelationships that influence adolescent health behaviours offers a better understanding of why they are so hard to reach. Indications are that interventions should focus less on individual health behaviour outcomes. Instead, successful interventions may include those that focus on personal and social skills, for example decision-making, planning, media literacy and consumer literacy, and self-esteem.

P3.60

Muscle, fitness and well-being: health beliefs in protein supplements of recreational athletes

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SIG: Yes, Cancer Prevention and Management

Awards: No

Objective: A large number of recreational and elite athletes use protein supplements (PS) to improve their performance. Various studies have assessed the physiological consequences of PS, however, only a few have examined the psychological factors associated with the use of PS. Investigating the beliefs associated with PS might help to determine the predictors of consumption; especially, beliefs that differentiate between users and non-users of PS or subgroups, such as competitive athletes or irregularly physically active people, require further investigation. Additionally, previous research suggests that consumers' knowledge about nutritional supplements is low, however, it is unknown whether users of PS have a generally lower applied nutritional knowledge in comparison to non-users.

Methods: The study is based on an online survey of 1,044 participants (490 users of PS and 554 non-users) conducted in the German-speaking parts of Switzerland. Participants answered various questions relating to their beliefs about PS (e.g. 'Protein supplements increase well-being'), their activity level (GPAQ) and their applied nutritional knowledge.

Results: The results showed that most of the PS users were recreational athletes. They had higher nutritional knowledge than non-users. Nevertheless, they held stronger beliefs about the muscle mass modulating and health effects of PS than non-users. Also, further analysis showed that lowly physically active people are more likely to believe in the fitness promoting effects of PS than highly physically active people.

Conclusion: PS users appear to hold various beliefs about the impact of PS on health, well-being and fitness. The perceived positive features of PS, such as muscle gain, might induce users to overestimate their overall health and performance benefits (the 'halo-effect'). Misguided beliefs might not only induce people to buy expensive PS but might also prevent them from adopting appropriate strategies aimed at achieving the desired health and fitness effects.

P3.61

Use of model wellness policies and additional resources do not increase the strength and comprehensiveness of written school wellness policies

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: The purpose of this study was to evaluate if supplemental resources and model wellness policies aid school districts in writing stronger, more comprehensive school wellness policies. We hypothesized that districts that used the state supported model wellness policy would write stronger, more comprehensive school wellness policies than schools that did not use the model wellness policy.

Methods: This cross-sectional study contacted all (n=152) public school districts in a rural Midwest state. Participants included 91 districts that elected to submit a current school wellness policy and complete an electronic survey. The survey consisted of questions that classified districts into one of four groups: districts that utilized the Department of Education supported model wellness policy from the rural Midwest state and another resource (MWP+; n=28), those that utilized the model wellness policy and no other resource (MWP-; n=28), those that did not utilize the model wellness policy but did use another resource (NMWP+; n=11), and those that did not utilize the model wellness policy nor another resource (NMWP-; n=24). WellSAT was used to assess the total strength, total comprehensiveness, total overall score, and subsection scores (Nutrition Education and Wellness Promotion, Standards for USDA School Meals, Nutrition Standards, Physical Education and Physical Activity, and Evaluation) of each written policy. All scores were compared between groups using one-way ANOVA. Statistical significance was set at $p \leq 0.05$. Data is presented as mean scores \pm SD.

Results: No differences were found in total overall score (MWP+ 72.29 \pm 40.58; MWP- 80.79 \pm 35.38; NMWP- 58.77 \pm 36.30; NMWP+ 69.27 \pm 29.83; $p=0.2005$), total strength score (MWP+ 24.14 \pm 18.96; MWP- 26.50 \pm 16.36; NMWP- 17.85 \pm 12.70; NMWP+ 21.73 \pm 13.20; $p=0.2676$), or total comprehensiveness score (MWP+ 48.64 \pm 22.23; MWP- 54.29 \pm 20.47; NMWP- 40.92 \pm 24.07; NMWP+ 47.55 \pm 17.33; $p=0.1828$). In addition, no differences were found between groups for any subsection scores (all $p > 0.05$).

Conclusions: In contrast with our hypothesis, these data suggest state model wellness policies and/or other resources may not improve the quality of written school wellness policies. Further research is needed to better understand the specific needs of school districts in order to facilitate the creation of an effective tool to guide school wellness policy development.

P3.62

Effects of a 4-week exercise intervention on gastric emptying, appetite and energy intake in overweight and obese males

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Despite cross-sectional evidence suggesting gastric emptying (GE) is faster in active compared to sedentary individuals, the direct effect of exercise on GE has yet to be explored. The primary aim of this study was to assess the effects of a short-term exercise intervention on GE in sedentary overweight and obese males. The study also investigated the relationships amongst GE, appetite, energy intake and food preferences.

Methods: Fifteen males (BMI: $29.7 \pm 3.3 \text{ kg/m}^2$) undertook a 4-week exercise intervention. Supervised exercise sessions consisted of combined continuous and high-intensity intermittent exercise on a cycle ergometer five times per week. GE was assessed by ¹³C-octanoic acid breath test, appetite and food preferences by visual analogue scales and the Leeds Food Preference Questionnaire. *Ad libitum* energy intake was assessed at lunch at baseline and >48h after the last exercise session in week 4.

Results: Despite a significant reduction in body weight and increase in cardiorespiratory fitness after the 4-week intervention ($p < 0.05$), GE was unchanged (GE half time: pre, 175 ± 22 and post, 179 ± 21 min, $p = 0.25$). Although habitual energy intake, subjective appetite ratings, eating behaviour and food preferences remained unchanged, there was a small but significant increase in *ad libitum* energy intake at the lunch test meal ($p < 0.01$) at the end of the 4-week exercise intervention.

Conclusions: Four weeks of exercise did not alter GE. It is possible that a greater volume - hence energy expenditure - is required before impacting on GE.

P3.63

Assessment of Energy Balance and Nutritional Quality in Ontario Fire Rangers and Recommendations for Fatigue Mitigation Within Existing Workplace Structure

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective: Fire Rangers have high, annual injury rates. Fatigue resulting from long shifts, without adequate recovery time in between, has been cited as a major contributor to heightened worker injury rates within inherently demanding occupations. The seasonal occupation of wildland fire-fighting in Ontario, involves long hours of physical labour for up to 14 days, amongst a variety of environmental hazards, while rest and recovery time is in unfamiliar and unpredictable conditions. The purpose of this study was to evaluate energy balance and nutritional quality, as well as recovery quantity and quality, in Ontario Fire Rangers while on deployment during a fire season in order to support the development of fatigue reduction strategies.

Methods: Comprehensive physiological data were collected during the 2014 fire season (May to September) from Fire Rangers operating out of Sudbury, Ontario. Participants wore a Zephyr BioHarness3 heart-rate variability monitor while on deployment to collect measures of energy expenditure as well as time spent engaged in physical activity, stress, and recovery. To measure energy intake and nutritional quality, individual food logs were kept using an iPod Touch and analyzed using NutriBase Pro10 software.

Results: Our results support previous research on wildland fire-fighting and similar occupations indicating that Fire Rangers exhibit daily negative energy balance. Additionally, inadequate on-deployment nutritional quality was of particular note.

Conclusions: The results provide insight into energy expenditure and energy intake as physiological determinants of fatigue in frontline Fire Rangers and will form the foundation for Fire Ranger-specific fatigue mitigation strategies based on the principles of athlete nutrition. Furthermore, our results will help inform short-term workplace activity specific training programs (i.e. nutritional workshops) with the aim to reduce injury-rates and improve worker wellbeing upon implementation. This study is the first to use this methodology in an occupational setting, measuring energy balance comprehensively while on-the-job. The use of this assessment methodology for developing fatigue management strategies is expected to be utilized extensively in future research in this and other occupational settings. This study funded by: the Ministry of Labour; and the Ontario Ministry of Natural Resources.

P3.64

Developing a tool to measure adherence for multiple behaviour change to a Nutrition and Exercise Lifestyle Intervention Program (NELIP) for obese pregnant women to prevent excessive gestational weight gain.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: To design a tool to evaluate adherence to a Nutrition and Exercise Lifestyle Intervention Program (NELIP) that represents two simultaneous behaviour changes (both nutrition and exercise) to prevent excessive gestational weight gain (GWG) in obese pregnant women. As obese pregnant women may find it more difficult to adhere to a multiple behaviour change model we wanted to identify which behaviour change (nutrition, exercise or both) these women were more likely to follow to prevent excessive GWG.

Methods: We evaluated the primary outcome of excessive GWG and stratified the women (n=58) into gained excessively (E; n=28) and not excessively (NE; n=30). Excessive GWG was defined as rate of weight gain >0.30 kg per week (Institute of Medicine 2009 GWG guidelines for pre-pregnancy body mass index of ≥ 30.0 kg/m²). Retrospectively, we evaluated adherence to the nutrition component (1 point for each nutrition goal met) and to the exercise component (1 point for each exercise goal met). Points were summed to provide a nutrition score (3 points maximum), exercise score (3 points maximum) or total score (6 points). These scores determined which component (nutrition, exercise or both) was most important for behaviour change to prevent excessive GWG.

Results: Rate of weight and total weight gained while on the 18 week program were less in the NE group (0.17±0.18 kg; 2.97±3.0 kg) compared to the E group (0.58±0.14 kg; 10.0±2.5 kg; p<0.05, respectively). Of the women in the NE group, 73% achieved a score of 3 meeting all nutrition goals with only 27% of the women meeting all of the exercise goals (score of 3; p<0.01); with 87% of the women achieving a total score of 4 or higher. In the E group, 61% met all the nutrition goals, and 54% met all the exercise goals (p>0.05), with 89% of the women achieving a score of 4 or higher.

Conclusions: Obese women who did not gain excessively were more likely to adhere to the nutrition component of the intervention, while women who gained excessively may over report achieving both nutrition and exercise goals.

Funded by: Canadian Institute of Health Research, Rx&D Health Foundation

P3.65

Application of PRECEDE-PROCEED in HomeStyles: A Childhood-Obesity Prevention Intervention

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: PRECEDE-PROCEED is a comprehensive planning model that guides health promotion program development, implementation, and evaluation. Here is detailed how each phase of PRECEDE was used to create HomeStyles, a program that enables parents of preschool children to re-shape their home environments and lifestyles to prevent childhood obesity.

Methods: The four phases of PRECEDE were implemented to create an educational "diagnosis" to guide the development of the HomeStyles behavior change intervention.

Results/Findings: During phase one (Social Assessment), survey and focus group data from 138 parents of preschool children indicated that many parents practiced healthy behaviors, yet many barriers to healthy behaviors and home environments existed (e.g., time constraints, limited knowledge healthy portion sizes and cooking methods, perceived cost of healthy foods, concerns about neighborhood safety vis-a-vis outdoor play, neophobic eaters). The Epidemiological phase, based on survey and focus group data, and literature reviews, revealed parents' priorities were health and happiness of their children and families, and household harmony. Parents' own childhood experiences (e.g., forced to clean their plates, being rewarded with sweets) and grandparents who "spoiled" grandchildren and ignored the parents' wishes were common barriers to behavior change. The Educational and Ecological Diagnosis phase showed that key predisposing factors were knowledge and value placed on being healthy. Reinforcing factors commonly named were information and encouragement from doctors, friends, books, and online resources. Enabling factors included desire to be good parents with happy, cohesive families. These findings indicated that the principles of Adult Learning Theory (especially recognizing parents' life experiences) and Social Cognitive Theory constructs (especially self-efficacy and outcome expectations) should underpin the HomeStyles program. The final PRECEDE phase, Administrative and Policy Diagnosis, suggested that the intervention materials needed to be sensitive to parents' desire for family harmony, "comfort zone" for making changes children would accept, time and money constraints of families and researchers, and cultural and prior experiences.

Conclusion: The PRECEDE findings provided a clear "diagnosis" of parents' needs and interests that guided the development of HomeStyles. The value of PRECEDE is demonstrated by formative evaluation results indicating HomeStyles is well accepted by parents. Funding: USDA NIFA #2011-68001-30170.

P3.68

Qualitative research identifies intervention needs of military parents to prevent childhood obesity.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Abstract:

Purpose: Obesity is affecting US military service members and their children at rates similar to civilians. To determine intervention needs, focus group discussions were held at one Air Force and one Army Military Base in the Southwestern US. Parents of children ages 3-5 who attend Base Child Development Centers (CDC) participated.

Methods: Using modified principles of motivational interviewing, researchers asked parents about challenges to meeting recommendations to prevent childhood obesity, specifically these 7 Healthy Habits: eating more whole grain foods and more fruits/vegetables; getting more physical activity; consuming fewer sweet drinks; having less screen time; sleeping more; and having more family meals. Twenty-two parents (active military or spouses) participated.

Results/findings: Themes suggested that parents struggled with effective parenting skills including how to deal with picky eating. In addition, time demands of balancing parental responsibilities interfered with achieving the 7 Healthy Habits: homework, and bathing and bonding time, versus time spent in meal planning, especially when the latter could be accomplished by selecting fast food. Single parent households (and those who become single parents due to spousal deployment) appeared to face greater struggles in meeting the 7 Healthy Habits. Another common source of stress in these military families was meeting the annual military fitness requirements-which may contribute to body image issues for the entire family as per this parent quote to son who doesn't want to exercise "you do not want to end up big and fat." We found that blended families with large age gaps between children are common, resulting in a need for child health information that includes a wide age range. Parents expressed greater concern for their older children's health, as they perceived themselves to have less control over their health habits as compared to those of the preschool age children, and they felt that the Base CDC were already providing adequate nutritional and physical activity support for their younger child.

Conclusions: Overall, the study shows the need to address nutrition needs for the whole family (children of other ages and parental stressors), in interventions targeting military families, to better meet their needs for obesity prevention.

P3.69

Factors associated with the resolution of elevated blood pressure in the time between childhood and adulthood: the Childhood Determinants of Adult Health Study

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Children with elevated blood pressure (BP) tend to maintain their elevated BP into adulthood and have a higher risk for early indicators of cardiovascular disease. In contrast, those who are able to amend their trajectory to normal BP in adulthood are not at increased risk. The modifiable factors that alter the trajectory of elevated BP from childhood to adulthood are not well known. We aimed to identify the potentially modifiable factors that differ between children who maintain their elevated BP status into adulthood versus those who resolved their elevated BP status by adulthood. We hypothesized that relative improvements in adiposity, diet, physical activity, cardiorespiratory fitness, smoking, and socioeconomic position (SEP) would be related to resolution of elevated BP.

Methods: This study used longitudinal data from 245 participants (53% female) who had BP measurements collected at baseline, when aged 9 to 15 years, and at follow-up 20 years later. Modifiable factors available at both examinations included body mass index (BMI), fruit and vegetable intake, alcohol consumption, physical activity, cardiorespiratory fitness, smoking and SEP. Two BP trajectory groups (resolution, persistent elevated) were defined according to elevated BP status (prehypertensive or hypertensive) in childhood and adulthood. Associations between change in modifiable factors with the dichotomous outcome of BP trajectory group was examined using logistic regression.

Results: 48% of individuals with elevated child BP resolved this status by adulthood. Relative to those with persistently elevated BP, participants in the resolution group significantly ($P < 0.05$) decreased their BMI and alcohol consumption z-scores, and increased their vegetable consumption z-score by adulthood. Moreover, the proportion of participants with upwardly mobile SEP was significantly higher in the resolution (41.6%) versus the persistent elevated (27.5%) group. Though not statistically significant, there was a trend suggestive of a higher increase in cardiorespiratory fitness in the resolution group compared with the persistent elevated group.

Conclusion: Resolution of elevated BP in the transition from childhood to adulthood appeared to be partially determined by adoption of a healthy lifestyle. Promotion of these factors to children with elevated BP, predicted to be approximately 15% in the US, may reduce long-term cardiovascular disease risk.

P3.70

POWERPLAY: A feasibility study protocol and baseline findings of a gender-sensitive workplace intervention targeting active living and healthy eating in men

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SIG: Yes, Motivational Dynamics

Awards: No

Objective: Men who experience proportionately high rates of chronic illness (e.g., men in rural communities) can be hard to reach; yet few health promotion programs have targeted men. The purpose of this presentation is to describe the design protocol and outline baseline findings of the POWERPLAY program, a feasibility study examining a gender-sensitive workplace intervention targeting physical activity (PA) and dietary behaviour among rural based men.

Methods: The POWERPLAY program was developed through consultations with employers, community-based organizations, and potential end-users. Offered in workplaces, POWERPLAY focusses on male-dominated professions (i.e., truckers, terminal workers, and municipal services) using masculine messaging, friendly competition and self-monitoring as a means to promote sustained self-management. Mix-methods including focus groups, interviews and survey questionnaires are used to determine program feasibility and an estimate of behaviour change effectiveness. Baseline assessments were collected via computer assisted telephone interviewing, and follow-up feasibility and outcome assessments will be collected at the end of the program.

Results/findings: Baseline measures were completed by 139 men ranging in age from 18-66 (mean = 43.71) across four worksites. On average participants' had a Body Mass Index of 28.7 (SD=4.36), with 44% of participants reporting at least one health issue (e.g., high blood pressure, cholesterol, diabetes, heart problems). Baseline data also showed low fruit and vegetable consumption, with an average of 3.32 (SD = 2) servings of fruit and vegetables per day. Although 61.9% of participants stated that they met minimum recommended PA guidelines, they also indicated that they spent an average of 53.5% (SD = 28.46) of their workday sitting. In addition, a majority of participants stated that they were either interested, or extremely interested, in learning about being physically active (64.8%) and eating healthy (69.1%).

Conclusions: The POWERPLAY program will provide an estimate of the effectiveness of a gender-sensitive workplace initiative to improve PA and dietary behaviour of men working and living in rural communities. Study outcomes will also provide information on the feasibility and acceptability of this approach in a hard to reach and under serviced population.

P3.71

Physical activity and healthy eating in older Chinese immigrants to Australia: a qualitative study of environmental barriers and facilitators

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SIG: Yes, Policies and environments

Awards: No

Objective:

Compared to their Western counterparts, Chinese older adults living in their country of origin are more active and follow a healthy diet. The health of Chinese who migrate to Western countries often deteriorates over time as they adopt Western dietary patterns and reduce their levels of physical activity. This is likely due to environmental factors. We need to identify potential environmental barriers and facilitators of healthy eating and engagement in physical activity among older Chinese immigrants to Western countries, such as Australia.

Methods:

Chinese older adults born overseas (N=59, 66% female) and living in areas of Melbourne (Australia) stratified by walkability were recruited. Nominal group technique (NGT), a structured multi-step brainstorming technique, was used to generate responses. Participants were asked to list things about places where Chinese elders live that would make it easy/difficult to engage in physical activity and healthy eating. Written prioritised responses were collected and classified into thematic categories by two independent researchers.

Results:

Seven NGT groups (range 8-13 per group) generated 11-16 and 6-15 responses per group for barriers/facilitators of engagement in physical activity and healthy eating, respectively. Availability of affordable/reliable public transport; access to shops and facilities; availability of recreational centres and parks; cheap parking; social support from family and the community; electronic media at home; traffic safety; access to Chinese community centres; and presence of Chinese-speaking neighbours and staff were thought to impact the ability to engage in physical activity in Australia. Access to grocery stores and open markets; access to affordable public transport; Chinese press publishing articles on healthy eating; strict food regulations and policies; restaurants serving healthy options; affordable health foods; family members following a healthy diet; and community seminars on healthy diets were thought to impact healthy eating.

Conclusions:

Accessibility and affordability of relevant services and public transport, social support from family members and the community, and communicational barriers were identified as major factors affecting the ability to maintain a healthy lifestyle by older Chinese immigrants living in Melbourne, Australia

P3.72

Feasibility and initial effectiveness of 'Just4Mums' - a community based healthy eating and physical activity course for obese pregnant women.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Introduction:

A free six week group-based course for obese (BMI ≥ 30) women was developed to support women to eat healthily and keep active during pregnancy. During a two year pilot 429 women self-referred or were referred to the course by their midwife. The service was delivered during the day on a weekday in different community locations for two hours each week and provided information on healthy eating and opportunities for physical activity. The aim of this evaluation was to provide evidence on feasibility through uptake and attrition rates and preliminary evidence on efficacy.

Methods:

Obese pregnant women were asked to self-report their healthy eating, physical activity (PA), walking and screen time behaviours at the beginning and end of the course. Mental wellbeing and mediating variables (intention, self-efficacy and attitude towards fruit and vegetable intake and moderate PA) were also assessed.

Results:

Sixty women (14% of those referred) started the course, and 34 (57% or 8% of those referred) completed the course. There were no differences between completers and dropouts at baseline. After attending the course, the intention-to-treat analysis showed an improvement in the women's healthy eating (increased fruit and vegetable intake and reduced fast food intake, both $p < 0.01$) but no change in walking or moderate physical activity. There was a reduction in reported screen time ($p = 0.006$) and participants' mental wellbeing improved ($p = 0.008$). Lastly, the participating women reported an increase in their attitude, intention and self-efficacy towards engaging in PA and intention to eat fruit and vegetables (all $p < 0.05$).

Conclusions:

Very few women started the course and of those, only 57% completed it. This suggests that the course is not feasible in its current format. Findings from the women completing the course suggest it may influence short-term behaviour change and those constructs that determine health-related behaviour change. The course may also have a short-term effect on mental wellbeing and screen time. More research is needed to understand the low uptake of these types of antenatal weight management services and how uptake and retention can be improved.

P3.73

Family Health Climate and Parenting: exploring family environmental influences on children's health behavior

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Purpose:

The family environment is important in the development of children's health behaviors. In previous studies the relevance of general parenting (parent-child interactions across situations) and specific parenting practices (context-specific parental behaviors regarding children's eating and physical activity) has been shown. However, since these concepts are based on explicit behaviors of parents, they lack information on (1) the family as a whole, and (2) relevant perceptions and cognitions underlying the behaviors. The concept Family Health Climate (FHC) is a family-level variable which is defined as shared perceptions and cognitions concerning a healthy lifestyle within a family. A questionnaire was developed and validated in Germany (Niermann et al., 2014). It has been shown that the FHC is related to determinants of children's health behavior (e.g. intrinsic motivation) as well as to their health behavior. The present study will focus on the relation between general parenting, parenting practices and the new concept FHC, both in Germany and the Netherlands.

Methods:

An online questionnaire will be distributed in the Netherlands. Parents of 10-12 years-old children are asked to fill out questions regarding general parenting (Comprehensive General Parenting Questionnaire; Sleddens et al. 2014), food parenting practices (Gevers et al.), the Family Health Climate and child snacking behavior. Correlation and regression analyses will be conducted to determine the relations between the concepts. We hypothesize that FHC is positively related to 'healthy' parenting behavior and adds to the explanatory value of parenting in explaining child snacking. Furthermore, cross-national comparisons are made with the German data, in order to further validate the questionnaire.

Results:

The Dutch data were not available at the moment of Abstract submission. The German data demonstrated good psychometric quality of the scale (Cronbach's $\alpha = 0.86$); Confirmatory Factor Analyses showed acceptable fit and measurement invariance across different samples.

Conclusions:

Next to general parenting and food parenting practices, the FHC may be an important addition to general parenting and parenting practices in explaining children's health-related behaviors. We assume that linking different concepts representing attributes of the family environment will contribute to progress in studying mechanisms affecting the development of a healthy lifestyle in children.

P3.75

The Student Lifestyle Study: physical activity and dietary habits of North East of England University students

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SIG: Yes, Policies and environments

Awards: No

Objective:

The university environment presents an important transitional life period for young people, with potential for unhealthy lifestyle behaviours to be established. Limited UK data exists concerning the impact of factors such as gender, degree subject or University accommodation on key health-related behaviours. The Student Lifestyle Study (SLS) is a multidisciplinary investigation into physical activity, dietary habits, perceptions of the local environment and body composition in North East of England University students; here, gender and degree-course differences in physical activity (PA) are considered along with initial dietary intake information including influence of residence-type.

Methods:

Using a cross-sectional design, 118 undergraduate students (20±1.2 years) were recruited, according to the most popular JACS code subject areas. All completed the 7-day International Physical Activity Questionnaire long form. Data were analysed as walking, moderate, vigorous and total PA min/day, mean MET min/day and total MET min/week. An initial subsample (n=29) completed a validated Food Frequency Questionnaire. Gender-differences were assessed using t-tests for PA and dietary variables; degree subject area differences in PA were analysed using one-way ANOVA.

Results:

Males reported greater vigorous PA than females (155.5±117.1 v 85.2±108.2 min/day, p<0.01). Sport (n=30) and Business (n=36) subject students reported greater vigorous PA than Psychology (n=52) students (172.3±116.7 v 141.9±133.3 v 72.4±88.0 min/day respectively, p<0.05). Sport students also reported greater mean daily MET min and total MET min/wk compared to Psychology. Overall, 69% of students were classed as high, 24% moderate and 6% low activity level. Initial dietary findings indicated that 55% of students exceeded the EAR for energy intake and 97% of all students exceeded the RNI for total sugar intake. Students residing in the family home reported greater carbohydrate, total sugar, energy and fat intakes (p<0.05) compared to those living with fellow students.

Conclusions:

University students in the North East of England appear to meet current PA recommendations regardless of degree subject, however we suggest that objectively measured PA comparison data would provide clarification around any potential social desirability bias present in this group. Further investigation of food intake is required, specifically around factors influencing elevated energy and sugar intake.

P3.76

PhotoVoice: Engaging the School Community in School Wellness Efforts

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Introduction: Currently there are no interactive tools that allow school communities to assess their school wellness needs and foster interest in wellness efforts. PhotoVoice is a participatory action research methodology commonly used in public health that utilizes photography to document and showcase community strengths and weaknesses in order to promote change.

Purpose: The purpose of this study was to gather perceptions of a school community after using PhotoVoice to document school wellness efforts (SWE).

Participants: High school students (n=103) and school community members (i.e., residents of community, school faculty) (n=188) were recruited across three school districts.

Methods: High school students were asked to attend four educational sessions about how to use PhotoVoice. Students were then asked to use PhotoVoice to capture the strengths and weaknesses regarding SWE at their school and these photographs were displayed in photo-exhibits (n=3). High school students (i.e., those who used PhotoVoice (n=49) and those who did not (n=67)) and school community members (i.e., residents of the community/parents) (n=54) and school faculty (n=18) were asked to attend the photo-exhibits and complete an open-ended survey immediately following the photo-exhibit. Data was analyzed using content analysis theory to identify themes.

Results: The most common theme reported after viewing the photo-exhibit was an increase in awareness of SWE (n=54). A small number of participants reported no change in awareness (n=14). A report of no change in awareness was less likely in students who used PhotoVoice (2%) compared to students that did not (13%). The photo-exhibit increased participants' motivation to take action (i.e., wanting to discuss SWE with others) (n=26) or made them willing to do something (i.e., need to get more involved with the school) (n=20) to improve SWE. School faculty (22%) and students who used PhotoVoice (18%) responded with the most motivation to take action to improve SWE. Motivation was lower in students who did not use PhotoVoice (13%) and residents of the school community/parents (7%).

Conclusion: These data suggest PhotoVoice may help increase awareness and motivate members of the school community to improve SWE, all while creating a positive transdisciplinary project based learning experience for participating students.

P3.77

Parenting and home environment as targets in childhood overweight prevention: results from the ChecKid study

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SIG: Yes, Children and families

Awards: Yes, for the Early Career Award

Aim: Parents play an important role in the dietary and physical behaviour of young children; they are not only role models, but also have a big influence on the direct home surroundings. Aim of this study is to find indications for the prevention of childhood overweight and obesity in the context of parenting and the home environment.

Method: A cross-sectional study was carried out among 4,072 children aged 4-13 years in the city of Zwolle, the Netherlands. In these children, data were available on measured height, weight and waist circumference, and from a parental questionnaire, on socio-demographic characteristics, nutrition, physical activity and sedentary behaviour. Associations were studied using logistic and linear regression analyses, adjusted for potential confounders.

Results: Watching television >1,5 hours, short sleep duration and not eating vegetables daily were related to childhood overweight. The results further show that there are four main themes that seem to be important when creating a favourable home environment. These main themes are a physical home environment, having rules, structure and routine in the household and by parents and children doing things together.

Conclusion: Parents are an important focus for interventions and should be supported by professionals in creating or maintaining a favourable home environment and with that contribute to a healthy upbringing. Pedagogues could play an important role in this. They have skills to discuss sensitive subjects with parents and are trained to support parents in parenting issues.

P3.78

The Use of Mobile and Social Media Messaging in a Randomized Obesity Prevention Trial for American Indian Families with Preschool-Aged Children.

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SIG: Yes, e- & mHealth

Awards: No

Objective: Among low-income US preschoolers, American Indian (AI) children experience the highest rates of childhood obesity and risk of related future chronic disease. To address this disparity, our previously successful Healthy Children, Strong Families (HCSF) intervention was modified to test the effectiveness of our mailed healthy lifestyles curriculum augmented with text messaging and Facebook support. Previous studies have demonstrated the efficacy of mobile and web-based interventions in other populations, but HCSF is the first randomized trial to engage AI families using this approach.

Methods: HCSF is a two-year family-based randomized trial currently recruiting AI children (2-5 years) and their primary caregivers from 5 urban and rural tribal communities nationally. HCSF utilizes a crossover design: during Year 1, child-caregiver pairs are randomly assigned to the Wellness (intervention) or Safety (active control) Journey, and families transition to the other Journey for Year 2. The Wellness intervention includes monthly mailed healthy lifestyle lessons (consisting of newsletters, books, games, etc.) complemented with wellness-focused text messages twice per week and health promotion posts three times per week to community-specific private Facebook groups. Social media and text messaging engagement is being assessed using Facebook tracking, surveys and open-ended questions.

Results: To date, 378 child-caregiver pairs have been enrolled; mean child age 3.3+1.0 years (51.2% female), with 46.2 % being overweight/obese; mean adult age 31.5+ 8.7 years (94.7 % female), with 86% overweight/obese. Participant surveys indicate high levels of satisfaction with mailed intervention delivery, including Facebook and text messages. Optional Facebook membership was chosen by 90% of intervention families, with significantly lower overall Facebook engagement by viewing/commenting on content, mean 55%, with site ranges of 38-67% engagement. Moreover, text messaging and Facebook proved useful for study visit reminders and follow-up. Significant challenges include frequent interruption of service (including phone number changes) and wide variation in engagement with Facebook. Future work is planned to examine factors related to participant engagement with mobile and social media support (e.g., age, geographic location, education).

Conclusion: Mailed healthy lifestyle interventions augmented with mobile messaging and social media content may be an acceptable way to approach childhood obesity prevention efforts with AI families.

P3.79

Shaping sons and daughters of the king: How Orthodox Jewish childhoods navigate food and fitness

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective:

This paper offers novel insights into practices of nutrition and physical activity during Orthodox Jewish childhoods. Particular Orthodox sub-communities are considered 'hard to reach' by health authorities, and remain relatively understudied compared to other ethnic and religious minority groups. The lives of Orthodox Jewish children are circumscribed by religious and educational obligations, notably *kashrut* (religious law applying to food) and an elongated school day which curtails recreational opportunities. What opportunities and challenges then exist in taking up NHS preventive health guidelines, such as the '5 a day' and suggested physical activity levels? Moreover, how do intricate socio-religious differences within Jewish Orthodoxy give rise to specific responses to health recommendations?

Methods:

A range of qualitative methodologies have been exercised to explore the specific socio-religious contexts in which nutrition and physical activity are practiced in a cross-section of Orthodox Jewish communities clustered in a major conurbation in the UK. In-depth ethnographic research has been conducted with Jewish families, community institutions, and a state-aided Orthodox primary school. Semi-structured informal interviews with children and parents provide further insight into *Haredi* (typically considered as ultra-Orthodox) families.

Results:

Nutritional practices and opportunities for physical activity during youth are contextualised by interpretation and observation of socio-religious codes of conduct, indicating that the uptake of health messages are impacted by intra-community differences. The uptake of health information relating to nutrition and physical activity is affected by a range of socio-religious issues including cost, gender sensitivities, and perceptions of what activities are considered to be 'Jewish' or not. This paper goes on to present novel observations of the newly introduced Free Schools Meal programme in a local Orthodox Jewish school, and claims that the difference between what is offered and what is consumed means that nutritional guidelines for infants are not always met through school channels.

Conclusions:

Campaigns to increase the uptake of preventive health messages within Orthodox Jewish communities in the UK must consider its inherent diversity. Understanding the lifestyles of Orthodox children can have a direct impact on attempts to reduce inequalities in access to health information and opportunities to optimise child health and development.

P3.80

A Multisite 2-Arm Randomized Obesity Prevention Trial for American Indian Families with Preschool-Aged Children.

Adams A., Cronin K., Prince R., Parker T., Tomayko E., Berns, R., Kim, K. and the Healthy Children, Strong Families Research Group

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objective: American Indian (AI) children experience high rates of obesity and risk of future chronic disease. To address this disparity, our previously successful Healthy Children, Strong Families (HCSF) intervention was modified to test the effectiveness of our mailed healthy lifestyles curriculum augmented with text messaging and Facebook support. HCSF is the first multisite, randomized trial addressing diet, activity, screen time, stress, and sleep in AI families.

Methods: HCSF is currently recruiting AI children (2-5 years) and their primary caregivers from 5 urban and rural tribal communities nationally. During Year 1, child-caregiver pairs are randomly assigned to the Wellness (intervention) or Safety (active control) Journey, and families transition to the other Journey for Year 2 in a randomized crossover design. The Wellness intervention includes monthly mailed healthy lifestyle lessons (consisting of newsletters, books, games, etc.) complemented with wellness-focused text messages and posts to community-specific Facebook groups. The trial design was developed collaboratively with the participating communities with the primary outcome as change in child and caregiver BMI. Child and caregiver anthropometric, diet recall, physical activity, sleep, stress and socioeconomic survey measures are collected every 6 months for 24 month

Results: To date, 378 child-caregiver pairs have been enrolled (child age 3.8±1.0 years, 51.2% female; caregiver age 31.5±8.7 years, 94.7% female). Participant surveys indicate high satisfaction with the intervention. High levels of overweight and obesity (OV/OB) were observed at baseline of 46.2% for children and 82% for caregivers. Despite high OV/OB, caregiver concern for their child's weight status is low (30%) but was higher for themselves (71%); caregiver concern regarding chronic diseases (cardiovascular and diabetes) was also low. However, most were moderately or very confident in making lifestyle changes. Food insecurity was common (57%) and was significantly higher in urban families (82%, p<0.01). Increased child BMI was associated with lower household income (p<0.05) but associated with food insecurity only in urban families (p<0.01). Future work is ongoing to assess interactions among these factors.

Conclusion: HCSF is a novel multi-modal healthy lifestyle intervention for AI families demonstrating the critical need for early intervention and highlighting the significant challenges facing these families.

P3.92

Physical Activity and Health Related Factors in a National Sample of Gay, Lesbian and Bisexual College Students

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Previous studies have indicated that sexual minority college students (those who identify as gay, lesbian or bisexual) have unique health-related issues and may be less physically active than their heterosexual peers. Understanding the relationships between sufficient amounts of physical activity (PA) and other health-related factors in sexual minority students is important for professionals who design interventions to promote PA in college students.

Objective: The purpose of this study was to examine the associations between PA and other health-related factors in a national sample of sexual minority college students.

Methods: College students from 157 campuses in the United States completed the National College Health Assessment during the 2008-2009 academic year. Participants were categorized as meeting the current PA recommendation if they engaged in ≥ 75 minutes of vigorous PA, ≥ 150 minutes of moderate PA, or ≥ 150 minutes of moderate to vigorous PA weekly. Hierarchical binary logistic regression was used to examine the contribution of variables in predicting whether or not participants met the PA recommendation. Variables were entered into the model in three steps: 1) gender, age and race; 2) club and intramural sports participation; and 3) 14 health-related behavior/characteristic variables (general health, seatbelt use, physical fighting, smoking, marijuana use, binge drinking, prescription drug misuse, number of sexual partners, fruit and vegetable consumption, depression, suicide ideation, stress, sleep and BMI).

Results: There were 3,246 sexual minority students (58.3% female, 68.1% white) included in the analyses. The addition of the 14 health-related variables at step 3 resulted in a statistically significant improvement in the model, [$\chi^2(14, N = 3,246) = 90.81, p < .001$, Cox & Snell $R^2 = .05$]. The highest adjusted odds ratios (AOR) were for fruit and vegetable consumption (AOR = 2.34) and perceived general health status (AOR = 1.62). Seatbelt use, cigarette smoking, use of marijuana, binge drinking, prescription drug misuse, depression, contemplating suicide, sleep and stress level did not contribute significantly to the model ($p > .003$).

Conclusions: Five of the 14 health-related variables significantly predicted meeting the PA recommendation in this national sample of sexual minority college students.

P3.93

Developing Physical Activity Model for Primary Schools in Qatar: Qatar Active Schools

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SIG: Yes, Policies and environments

Awards: No

Physical activity (PA) is one of the key health indicators. The increasing trends of overweight and obesity among children ensure the need to promote PA and reduce sedentary behaviors. Daily PA is essential to child's development and important for children of all ages.

Childhood overweight and obesity rates continue to rise across the State of Qatar. In 2012, the prevalence of overweight and obesity among children and adolescents in Qatar was 37%, 9% respectively. The 2011 Qatar GSHS showed only 15% of school children were physically active, 30% attending physical education (PE) classes and 49.5 were showing sedentary lifestyle behaviors.

School is an ideal setting for teaching children and adolescents how to adopt and maintain active healthy lifestyle. Schools play a critical role by establishing a safe and supportive environment including policies and practices that promotes healthy behaviors and practice PA for lifetime. Although high-quality PE is the cornerstone of a school's PA program; still PA can be incorporated into the school curriculum in many ways beyond PE sessions. School-based PA program, in partnership with families and communities, play a major role in promoting active healthy living of children and adolescents, and can help to increase the level of PA that children need.

Qatar Active School Program (QAS) is an evidence-based best practice model that is targeting elementary schools in the State of Qatar. It is initiated by Healthy Lifestyle Program of Aspetar with the aim to enhance physical, mental, and social development of children in Qatar by incorporating PA into the culture of schools and sustaining it through school, family and community partnerships.

This work is going to discuss the development of an activities approach logic model for school-based PA program by describing the target population, the strategic plan of work, in addition to the core components of the model and the development process.

P3.94

Feasibility of an accelerometer calibration protocol for children with intellectual disabilities

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

Accelerometry has not been calibrated for the estimation of physical activity in children with intellectual disabilities (ID), thus raising validity questions regarding the interpretation of accelerometer data in this population. Various protocols and criterion measures have been used in calibration studies involving typically developing (TD) children; however, the suitability of these activities and measures for children with ID is unknown. Therefore, the purpose of this study was to test the feasibility of a laboratory-based calibration protocol for children with ID. Specifically, the feasibility of activities, measurements, and recruitment was investigated.

Method:

A convenience sample of five TD children (12.40 ± 0.01 years) was initially recruited to test the suitability of the protocol and allow comparison. Five children with ID (10.20 ± 0.98 years) were recruited from two additional support needs schools, where eligible children received a study information pack inviting them to participate. Participants performed a free-living and treadmill-based activity protocol during two laboratory-based sessions. Activities were performed for 5 minutes and ranged from sedentary to vigorous intensity. Treadmill activities ranged from 3 to 8 km/h and free-living activities included watching a DVD, passing a football, and jumping jacks. Resting energy expenditure was measured and a graded exercise test was used to assess cardiorespiratory fitness. Breath by breath respiratory gas exchange and accelerometry were continually measured during all activities. Feasibility was assessed using observations, activity completion rates, and respiratory data.

Results:

All TD participants and one participant with ID completed the protocol. The physical demands of the treadmill-based activities affected the completion rate for participants with ID. No participant met the maximal criteria for the graded exercise test or attained a steady state during the resting measurements. Limitations were identified with the usability of respiratory gas exchange equipment and the validity of measurements. The school-based recruitment strategy was not effective, with a participation rate of 6%.

Conclusions:

Due to issues with the usability and validity of breath by breath respiratory gas exchange and recruitment, a laboratory-based calibration protocol is currently not feasible for children with ID. An alternative field-based protocol with a non-invasive criterion measure should be considered for future studies.

P3.95

Physical Activity Policies and Environmental Supports in Rural and Urban Kansas Communities

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SIG: Yes, Policies and environments

Awards: No

Purpose: The purpose of the study was to assess the prevalence of policies and environment supports that promote physical activity in rural and urban Kansas communities using a community-based participatory tool that has not yet appeared in the literature.

Methods: The Centers for Disease Control and Prevention's CHANGE (Community Health Assessment aNd Group Evaluation) tool was administered to 32 communities in Kansas. Community coalitions in each of the 32 communities completed the CHANGE tool, which included 14 items related to physical activity policies and 14 items related to physical activity environments. Each coalition rated their community's physical activity policies and environment, using a scale ranging from 1 (least present) to 5 (most present). For analysis, communities were stratified into 'rural' and 'urban' based on the known population densities of their counties (fewer or greater than 40 people per square mile). A one-sided Wilcoxon-Mann-Whitney rank sum test was conducted on each of the 14 physical activity policy and environment items to ascertain differences on the 28 items between urban and rural communities.

Results: There were significant differences between rural and urban communities for 13 of the 28 physical activity items. Urban communities were more likely than rural communities to require sidewalk construction (mean=4.67, 2.69, $p = 0.0167$), require bicycle facilities for all new developments (mean=2.67, 1.38, $p = 0.006$), and requiring Americans with Disabilities Act compliant sidewalk routes (mean=5.00, 3.67, $p = 0.0462$). Conversely, rural areas were more likely than urban areas to provide access to parks, shared-use paths, and trails (mean=4.23, 3.33, $p = 0.05$).

Conclusions: While there were differences in the degrees to which urban and rural areas supported physical activity policies and environmental supports in their communities, there was not a clear direction to this pattern. Rather than a consistent advantage or disadvantage in supporting specific physical activity policies and environmental supports for physical activity, rural and urban communities seemed to support the policies and environments which best fit their communities. This study suggests that physical activity policies and environmental supports need to consider rural-urban status, based on community size and population density.

P3.96

Validation of Physical Activity Survey for During School Activities in Urban Children

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: To evaluate the reliability and validity of a new self-reported during school physical activity (PA) scale added to the Physical Activity Survey (PAS) among underserved urban children.

Methods: A sample of 81 fourth grade students (mean age=9.23 years, SD=0.62; 39 girls) was recruited from two urban Minnesota elementary schools in Fall 2014. The majority was African American (54.3%), followed by 30.9% non-Hispanic White. A battery of valid questionnaires assessed children's PA intentions, outcome expectancy, social support, and self-efficacy as well as before and after school PA (Gesell et al., 2008). Children's during school PA was measured by a newly created self-report scale and objective accelerometers. Internal consistency was calculated to discern reliability of this new scale. Regression analyses were used to evaluate the predictive validity between the new scale and accelerometer-determined PA in addition to the concurrent validity of the new scale for before and after school PA. Finally, a regression analysis was performed to surmise the relationship between children's self-reported during school PA and PA intentions.

Results: Internal consistency of the new scale was acceptable ($\alpha = 0.83$). Marginally significant results for criterion validity were seen between the new scale and accelerometer-determined during school PA, $\beta = 0.20$, $p = 0.08$, with 4.0% of the variance in accelerometer-determined PA attributable to the self-reported scale. Further, children's self-reported during school PA was a significant predictor of their before school PA, $\beta = 0.59$, $p < 0.001$, and after school PA, $\beta = 0.30$, $p = 0.006$, explaining 34.3% and 9.0% of the variances in before and after school PA, respectively. Finally, self-reported during school PA was a significant predictor of PA intentions, $\beta = 0.44$, $p < 0.001$, accounting for 19.0% of the variance in PA intentions.

Conclusions: The newly established during school PA scale appears to have acceptable reliability as well as sufficient criterion validity. Further, self-reported during school PA appears to be a significant predictor of PA intentions suggesting that incorporating PA into all aspects of the school day may increase the likelihood a child is physically active in other contexts.

P3.97

Systematic review of the validity and reliability of field-based measures for assessing movement skill competency in lifelong physical activities

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: It has been suggested that young people should develop competence in a variety of 'lifelong physical activities' to ensure that they can be active across the lifespan. However, there is a lack of consensus regarding what are lifelong physical activities. Therefore, the aims of this systematic review were to provide a clear definition of lifelong physical activities and assess the methodological properties, validity, reliability and test duration of current field-based measures for assessing movement skill competency in lifelong physical activities.

Methods: Four online databases (Scopus, SPORTDiscus, Proquest and Pubmed) were searched for process-oriented tests of lifelong physical activities assessing movement skill competency and reporting at least one type of validity and/or reliability.

Results: Sixteen articles were included in this review, consisting of eight different lifelong physical activities (i.e., resistance training, badminton, tennis, cycling, racquetball, swimming, golf and dance). All of the studies reported moderate to excellent levels of at least one type of reliability. Inter-rater reliability (75%) was most commonly reported, followed by intra-rater reliability (44%) and test-retest (25%) reliability. Conversely, validity was only reported in nine of 16 studies with content validity (38%) being the most commonly reported, followed by construct (25%) and criterion (13%) validity. Test duration ranged from one to 45 minutes, but was only reported in eight studies.

Conclusions: Further development and evaluation of tools assessing lifelong physical activity movement skill competency are needed. Moderate to excellent levels of inter- and intra-rater reliability were addressed in the majority of studies. However, only one of these studies focused on within participant variation and change in mean. Validity results were less reported than reliability and only two studies examined criterion validity. Further study of the predictive validity of lifelong physical activity movement skill competency is needed to support the assertion that such activities provide the foundation for a lifetime of activity.

P3.98

School-time moderate-to-vigorous physical activity among elementary school-children in Qatar

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Recently a questionnaire based survey reported that 49% of the Qatari school-children do not meet daily recommended physical activity (PA) guidelines. Since children spend most of their daytime at school, it is important to objectively assess their PA during school hours.

Objective: This study aimed to determine levels of moderate-to-vigorous PA in Qatar elementary schools.

Methods: a cross-sectional epidemiological study was conducted in four randomly selected elementary schools in Qatar. Two classes representing grade 1 and grade 4 were randomly selected within each school. Out of the 200 school-children, 194 (93 boys and 101 girls) gave parental consent. PA was assessed using three-axial accelerometer (ActiGraph® wGT3X-BT). Participants wore accelerometers in their non-dominant wrist during the school-time (7AM to 1PM) for five consecutive school days of the week. Moderate-to-vigorous physical activity (MVPA) was scored and classified according to Evenson (2008) and Troiano (2008) for grade 1 and grade 4 respectively. Children were classified as overweight (body mass index > 95th percentile) or risk of overweight (> 85th percentile) using CDC growth charts. Linear mixed models was used to assess association of MVPA parameters with day of the week, ethnicity, gender and grade.

Results: Our results showed, percentage of MVPA (%MVPA) on the first day of the week (20.4±0.6%) was generally 5% less compared to other weekdays except the day before weekend (P<0.001). Total step count and %MVPA among Qatari children (5323±91 and 22.4±0.5%) was similar to non-Qatari children (5355±172 and 22.4±1.0%) P>0.867. Grade 4 students were more active than grade 1 (P<0.001). The interaction of Grade × Gender (P=0.004) suggested that %MVPA between boys and girls was similar in grade 1 while grade 4 girls were less active (22.9±7.3 %/day) than grade 4 boys (31.4±11.0%/day), P<0.001. Neither overweight children nor children with risk of overweight showed any association with MVPA parameters.

Conclusion: This is a first study to assess objective measures of PA during school hours among elementary school-children in Qatar. Further interventions are needed to promote activities among grade 4 girls during school hours.

P3.99

The Role of Nurses in Physical Activity Promotion: A Systematic Review of Nurse-delivered Physical Activity Interventions in Primary Care

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

Nurses are uniquely positioned to motivate patients towards health behavior changes. The specific role of nurses in physical activity (PA) promotion is understudied. The purpose of this systematic review is to describe primary care nurse-delivered PA interventions and determine intervention attributes which led to positive changes in PA.

Methods:

A search of intervention studies conducted by primary care nurses was conducted through: CINAHL, PubMed, PsycINFO, SportDiscus, Cochrane. Key words included *physical activity or exercise or walking and primary health care*. Titles and abstracts were screened independently by two reviewers for inclusion criteria: published in English between 1990-2014, used a nurse-delivered intervention delivery and directly measured overall PA, exercise, or walking.

The five steps of the constant comparison data analysis method were used: data reduction, data display, data comparison, conclusion drawing, and verification. Quality of evidence was classified according to American Association of Nurses' levels of evidence hierarchy.

Results/findings:

Initial search yielded 1,736 citations. After removing duplicates, screening titles and abstracts, 392 potentially relevant studies remained. After full-text readings, 377 were excluded. Four additional studies were identified through ancestry searches. The final sample included 19 articles.

Seven studies were conducted in the U.S. Ten were guided by health behavior theories. Eleven used a single delivery mode: face-to-face (n=9), telephone (n=1), or web-based (n=1). Eight used a combination of delivery modes. The role of nurses varied including: leading exercise training or monitoring programs, counselling, and providing motivational communication. Fifteen studies reported greater PA in intervention subjects.

Conclusions:

The most common nurse-delivered intervention was PA counselling with supportive, motivational contacts. No single intervention component consistently produced successful outcomes. Mixed findings suggest that additional primary research is necessary. To further support the role of nurses in promoting PA, future studies need to specifically examine the influence of the nurse interacting with patients for health behavior change.

P3.100

Built environment correlates of walking from metro in Beijing

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SIG: Yes, Policies and environments

Awards: Yes, for the Early Career Award

Purpose: This study reports a test of associations between built environment characteristics on walking from metro to destination. The study focused on the concern that station local environment planning has given little consideration to walking conditions in the larger environment and the integration of built environment with station facilities.

Methods: Walking behaviors and built environment perceptions (N=493) were collected at six study stations in three distinctly different physical settings in Beijing—two hutong, two danwei and two xiaoqu (built after 1980). We accompanied willing participants to record walking routes from the metro station until they arrived at their destinations. Evaluations of the built environment, in terms of perceptions of pavement infrastructure, motor traffic along the walking path, and design aesthetics, were collected using a questionnaire after the participants arrived at their destinations. A geographic information system (GIS) was used to map walking routes and code built environment variables. Walking behavior outcomes were measured in walk time from metro exit to participant's destination. A multivariate linear regression model was used to test for associations between built environments and walks from the metro.

Results: In the xiaoqu built environment, metro riders needed to walk a longer distance to their destinations compared with hutong. There is a variation on walking time in the danwei built environment. Retail, entertainment, and institutional land use destinations have shorter walking time compared with residential land use. Greater visual connectivity predicts a shorter walking time, while less motor traffic predicts a longer walking time.

Conclusions: Quantitative and qualitative aspects of the built environment around metro stations influence walk time from metro to destination. Visual connectivity and non-residential land uses around the metro station are associated with shorter walking time and may capture more metro riders.

P3.102

Examination of the physical activity levels at Glastonbury Festival using GPS and an accelerometer-based Actigraph monitor

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Despite the popularity of outdoor music festivals in the UK, no evidence exists of the volume or intensity of movement that occurs through attendance at these festivals and the potential health benefits this may provide. The aim of this case study was to accurately record the amount of physical activity at Glastonbury Festival.

Methods: Case study design. One male wore an Actigraph GT3X+ activity monitor and an iGotU GPS data-logger, both selected due to continuous recording period and battery life of greater than six days, to the 2013 and 2014 Glastonbury Festivals. Activity data was collected in 10 second epochs whilst GPS sampling rate was 0.016Hz (1 per minute). GPS data sampling was validated against a high frequency (10Hz) Catapult Minimax device with short battery life. Total and daily distances travelled, movement speeds and durations were recorded. Activity levels were identified based on step counts per minute thresholds and the total duration spent in moderate to vigorous intensity physical activity (MVPA) was calculated and compared against current NHS guidelines.

Results: A sampling error of <2% for the iGotU device and a low overall GPS data loss of 4.5% was found. Total distances of 259.06km and 236.74km and average daily movement durations of 11 hours 32 minutes and 11 hours 14 minutes were recorded at the 2013 and 2014 festivals respectively. Daily average speeds ranged from 1.4 to 3.25 km/h. In 2013 the participant performed a total of 1091 minutes of MVPA over the six day festival period, with 714 minutes recorded in 2014.

Conclusions: Large movement distances of over 200 km and MVPA five to seven times greater than the recommended guidelines for health benefits were found, highlighting the potential use of festivals as a novel way of promoting physical activity. This case study provided a unique opportunity to record the volume of physical activity that occur at an outdoor UK festival using objective measures of GPS data and accelerometer-based movement analysis. Additionally it proves a robust measurement protocol for further study of physical activity at festivals across a range of populations and festival types.

P3.103

Physical activity experiences for children under five years of age in the home and early childhood education setting

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SIG: Yes, Early care and education

Awards: No

Purpose: The primary purpose of the study is to investigate physical activity provision for children under five years of age, in both their home and early childhood education setting. The main research question is "What does physical activity provision look like within and between the home and early childhood education setting? There is no previous research that has been carried out in this area. Whilst there has been research into what physical activity occurs in early childhood education settings, and there has been limited research into what physical activity looks like in the home setting for children under five years of age, there is no research performed that looks specifically at physical activity provision in a child's home *and* early childhood education environment. The concern being that everybody may be assuming that others are providing for young children's physical activity experiences. This is evident in the Irwin, Bouck, Tucker and Pollett, (2005), and Tucker, Irwin, Bouck and Pollett, (2006), which shows that whilst parents may be assuming physical activity requirements are being met at the early childhood settings, the early childhood teachers are not prioritising this area of development as they presume it is being catered for in the home environment.

Methods: Engeström's (1987, 1999) Cultural Historical Activity Theory underpins the notion of *contradictions*. This concept will be used to identify 'tensions' and differences in physical activity provision within and between the home and early childhood education settings. This qualitative study will draw on the four levels of contradictions or 'tensions' in physical activity provision. There will be a small number of parents and early childhood education teacher participants. The teachers will work at the early childhood education centre the parent's child attends. A case study approach will be used. The methods of data generation are participants recording physical activity by taking photographs, and filling out recording sheets. Semi-structured and unstructured interviews will help make meaning of the participants data.

Results/Findings/Conclusions: As the PhD investigation will occur during 2015 the results and findings are pending.

P3.104

Perceived barriers, motivators, and benefits of physical activity in Qatar

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SIG: Yes, Motivational Dynamics

Awards: No

Aim:

Epidemiological surveys suggested low level of physical activity among adults living in Qatar. To ensure the success of physical activity promotion programs, a better understanding of the motivators and barriers to physical activity is needed. This study aims to identify barriers and motivators.

Method:

This survey was conducted through semi-structured questionnaire build based on the elements of behavioral theories. Data were collected from 300 adult subjects from different workplaces. In addition to the perceived health benefits, the questionnaire included perceived personal and environmental barriers, personal and social motivators to physical activity.

Results:

Subjects mean age was 35.3±10.6 years, with 53% were females and 51% were local Arabs. In general subjects identified. Playing sports with friends and keep body shape, or reducing weight have been identified as main motivators for being physically active. While subjects have identified hot climate, absence of facilities in their neighborhoods and work commitment as the main barriers. While males considered work commitments as main barriers to do physical activity, females identified family commitments as main barrier. Although local Arab people considered hot climate as main barrier, non-Arab expatriates don't considered as barrier. Subject reported feeling happiness, reduction of stress and feeling more energetic as the main benefit is to be active.

Conclusion:

Programs and campaigns promoting for physical activity in Qatar need to address the following motivators and barriers to ensure higher participation and maintains of active behaviors.

P3.106

Correlates of participation and interest in extreme sport/adventure activities in gynecologic cancer survivors

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SIG: Yes, Cancer Prevention and Management

Awards: Yes, for the Student Competition

Objective: Most exercise oncology research has focused on traditional forms of exercise such as walking, biking, or weight training. Recent research has suggested that participating in alternative forms of exercise such as extreme sport/adventure activities may also improve health outcomes in cancer survivors. To date, however, no study has examined the correlates of extreme sport/adventure activity in any cancer survivor group. The purpose of this study was to examine the demographic, medical and behavioral correlates of participation and interest in extreme sport/adventure activities in gynecologic cancer survivors (GCS).

Methods: Using the Alberta cancer registry, a random sample of endometrial, ovarian, and cervical cancer survivors were mailed self-report questionnaire assessing medical, demographic, and behavioral variables and participation and interest in extreme sport/adventure activity.

Results: Of 621 GCS who responded, only 12.1% reported participating in extreme sport/adventure activity in the past year. Of 309 GCS interested in a future exercise study, 41.1% were interest in trying an extreme sport/adventure activity. In multivariate analyses, GCS were more likely to have participated in extreme sport/adventure activity if they were meeting the aerobic exercise guidelines (OR=1.75 [95%CI: 1.02 to 2.99], p=0.041) and had better general health (OR=1.71 [95%CI: 1.01 to 2.90], p=0.048). GCS were borderline significantly more likely to participate in extreme sport/adventure activity if they had cervical or ovarian cancer (OR=1.95 [95%CI: 0.97 to 3.93], p=0.062), were employed (OR=1.71 [95%CI: 0.95 to 3.08], p=0.074), and were healthy weight (OR=1.58 [95%CI: 0.93 to 2.68], p=0.089). Moreover, GCS were more likely to be interested in trying an extreme sport/adventure activity if they had cervical or ovarian cancer (OR=1.76 [95%CI: 0.94 to 3.27], p=0.077) and were meeting the strength exercise guidelines (OR=1.68 [95%CI: 0.95 to 2.98], p=0.076).

Conclusion: Medical, demographic, and behavioral variables predict participation and interest in extreme sport/adventure activity in GCS. These correlates generally indicate greater participation and interest in extreme sport/adventure activities among GCS with better physical functioning and greater financial means. Strategies to help GCS overcome these barriers will be necessary to increase participation rates in extreme sport/adventure activities, and potentially improve health outcomes.

P3.107

Designing an Exercise Intervention: Exercise Behaviour and Preferences in Chronic Kidney Disease (CKD).

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SIG: Yes, Motivational Dynamics

Awards: No

Objective:

Chronic kidney disease (CKD) is a long-term progressive condition which increases the risk of all-cause mortality and reduces quality of life. National guidelines recommend exercise to manage comorbidities and symptom burden, as well as to improve functional ability yet the majority of people with CKD continue to be inactive. This project aimed to understand the patients' perspective on exercise to inform the development of a self-directed intervention to encourage exercise participation. This approach has been shown to be effective in the management of other long-term conditions and hence represents an area for development in CKD to improve quality of life and health outcomes for patients.

Methods:

Questionnaire data was collected in General Nephrology and Pre-dialysis outpatient clinics on 3 sites (Leicester, Northampton and Kettering). This included the Leisure Time Exercise Questionnaire (LTEQ) and free text comments regarding preferred activities and barriers/motivators to engaging in exercise. Clinical data was obtained from the participants medical records. The qualitative data from the free text comments were subjected to thematic analysis in NVivo.

Results:

1357 patients with CKD not requiring renal replacement were sampled (722 male; median age 68 years; median eGFR 29mL/min/1.73m²). 1104 participants were inactive (81.4 %) as defined by the LTEQ. Participants identified their preferred exercise modality, with walking being the preferred activity for the majority of participants.

Qualitative data analysis of free text comments from 333 participants generated themes regarding barriers and motivators to exercise. Barriers identified were physical (fatigue, non-specific, co-morbidities) psychological (reduced motivation, anxiety) and social (time and cost); whilst motivating factors included support, education, gentle exercise and motivation.

Conclusions:

This project has demonstrated that this population is inactive and would benefit from an exercise intervention. A preference for walking has been identified whilst factors that affect participation in exercise have been evaluated. This knowledge of the patient perspective will aid the design of an intervention rooted in appropriate behaviour change theory. This project has shown that a walking intervention, combined with an educational manual, has the potential to facilitate people with CKD to become more active.

P3.108

Exploring Physical Activity Levels in Chronic Kidney Disease: the role of Exercise Self-Efficacy and Stages of Behaviour Change.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Chronic kidney disease (CKD) is a global public health problem and is associated with a range of physiological and psychological complications that impact on patient quality of life. Physical activity (PA) is beneficial for patients with CKD and is recommended in national guidelines, but patients tend to lead insufficiently active lifestyles. Low exercise self-efficacy (ESE) and a lack of readiness to change have been identified as contributors to physical inactivity in the general population and other chronic diseases. However, this has not been explored in the U.K. CKD population.

Methods: 1351 CKD patients from the U.K. were recruited to complete a survey consisting of 4 validated questionnaires: General Practice Physical Activity Questionnaire (GPPAQ) to screen for inactivity, Duke Activity Status Index (DASI) to estimate functional capacity, Stage of Change Questionnaire (SOCQ) to identify patients' readiness to incorporate increased activity levels into their daily routine, and the Self-Efficacy Questionnaire (SEQ) to explore patients' confidence with regard to regular activity. Additional information was extracted from clinical records (721 male; median age 68 [range 16-99]; median eGFR 29ml/min/1.73m² [range 5-90]).

Results/Findings: The GPPAQ identified that 74% were 'Inactive' and 90% were eligible for a 'Brief Intervention in PA' according to NICE guidelines. The SOCQ identified that 39% were in the 'pre-contemplation stage', suggesting that 61% were interested in increasing their level of activity. Those who were in the 'pre-contemplation stage' had significantly lower levels of ESE in comparison to the other stages of change ($P < 0.05$). Correlations showed that SEQ and SOC were both positively correlated to: GPPAQ ($P < 0.05$) and DASI ($P < 0.05$) when controlling for: age and eGFR.

Conclusions: This study highlights widespread physical inactivity amongst the UK CKD population but demonstrates high patient interest towards the idea of increasing PA. The findings suggest that Transtheoretical Model based interventions informed by the dominant stages of change, that focus on enhancing levels of ESE have the potential to effectively increase levels of PA in this predominately sedentary population.

P3.109

An Examination of the Relationship of Various Modes of Physical Activity with Academic Achievement for Post-Primary Adolescents.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Previous studies have documented the relationship of physical activity and academic achievement, however no studies have looked at the collective relationship of average physical activity, physical education, active commuting, extra-curricular and community based sport with academic achievement. The purpose of this study was to determine the effect of various modes of physical activity on academic achievement in post-primary (junior and leaving certificate) students in Ireland.

Methods:

Students ($n=269$; 50.9% male; mean age= 15.76 ± 1.35 , range=13-18) from post-primary schools (47.2% secondary, 34.9% vocational, 17.8% community) participated in a cross-sectional study. A valid and reliable questionnaire assessed students' demographics, physical activity levels (past 7 days), mode of commuting to school, total physical education time, extra-curricular and community based sport participation. Academic achievement score was acquired through individual results on state examinations in English and Mathematics, which were then used to generate a Total Academic Score (TAS). Pearson correlations and linear regressions were used to determine associations between the types of physical activity and academic achievement; and explain which types of physical activity best predicted academic score.

Results/findings:

For males a significant positive relationship was found between average physical activity and Mathematics ($p < .05$, $r=0.20$) and TAS ($p < .05$, $r=0.20$). A positive relationship was also found between physical education participation and English ($p < .01$, $r=0.32$), Mathematics ($p < .01$, $r=0.39$) and TAS ($p < .01$, $r=0.39$). For females a positive relationship was found between physical education participation and English ($p < .01$, $r=0.44$), Mathematics ($p < .01$, $r=0.42$) and TAS ($p < .01$, $r=0.48$). Regression analysis, controlling for school type and age, showed that physical education participation was a significant predictor of TAS for males showing 37% of the variance ($F(7,126)$, 10.62, $p < .01$) and females showing 32% of the variance ($F(7,116)$, 7.65, $p < .01$).

Conclusions:

Overall physical activity had a positive effect on academic scores for males highlighting the benefits of increased physical activity. Physical education participation was seen to have a positive association, and be a predictor of academic scores in both males and females. This highlights the positive effects of structured physical activity as part of the school curriculum and how it can be beneficial towards academic achievement.

P3.110

Strengthening Knowledge Mobilization to Improve Physical Activity Behaviours in People with Schizophrenia and Diabetes

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: Providing physical activity information to individuals with schizophrenia and diabetes has been suggested as a strategy to increase levels of physical activity, improve health, and prevent early mortality. This study examined preferred messengers, methods, and types of physical activity information required to help people with schizophrenia and diabetes become active.

Methods: This study followed a knowledge mobilization framework designed by Martin Ginis and colleagues (2012). Three focus groups and two interviews were conducted with 20 individuals diagnosed with schizophrenia and diabetes. Participants were asked about their preferred messengers and methods of physical activity information as well as what information is needed to become active, when that information should be delivered, and how that information should be tailored to meet the needs of people with schizophrenia and diabetes. Focus groups and interviews were audio recorded, transcribed verbatim, and analyzed thematically.

Results: Participants pointed to social workers, physicians, and friends and family as preferred messengers of physical activity information. Participants identified individuals who were accessible and who could provide personalized information. Participants identified several different passive methods to deliver physical activity information, including calendars, newsletters, flyers, e-mails, and websites. Participants preferred paper based methods, like flyers and calendars, as opposed to online sources. Individuals warned that online information was often inaccurate and difficult to access. Participants mentioned that information should focus on programs available to clients. This would include information on activity types, costs, locations, times, and transportation options. Participants noted they would like information on the physical and mental health benefits of physical activity, specific exercises to achieve different fitness goals, and ways to exercise to accommodate different abilities. Participants mentioned that physical activity information should always be available, but that greater efforts should be made to deliver it to people when they are diagnosed with schizophrenia.

Conclusions: Healthcare professionals need to work with family and friends of individuals with schizophrenia and diabetes to provide personalized physical activity information. Service providers need to implement strategies that provide physical activity information to clients in an accurate, accessible, and personalized manner as quickly as possible after a mental health diagnosis is made.

P3.111

Web-based methods are more cost-effective than print-based methods to attract people to a physical activity intervention. Web-based methods are more cost-effective than print-based methods to attract people to a physical activity intervention.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: Identifying cost-effective and efficient methods to attract people to web-based health behaviour interventions is required. Traditional methods including leaflets, posters and newspaper advertisements remain popular despite the expanding range of web-based methods which have the potential to reach larger numbers at lower cost. This study compared the cost-effectiveness of web-based and traditional print methods to attract people to a web-based physical activity (PA) intervention.

Methods: A range of traditional print (newspaper advertisements, leaflets and posters) and web-based (Facebook advertisements, Google AdWords and posts in community forums) methods were applied to attract participants to a web-based PA intervention in Australia. The cost, number of first time website visits, sign ups, and demographics of participants were recorded for each method. The demographics of people reached through web-based and print methods were compared using chi square analyses and t-tests.

Results: A total of 207 people signed up to participate in the PA program. The print methods amounted to an average of AUD \$78 per sign up. More specifically, letterboxing totalled AUD \$162, newspaper advertisements AUD \$112, and posters AUD \$52 per sign up. The web-based methods amounted to AUD \$43 per sign up. More specifically, Google AdWords totalled AUD \$215, non-targeted Facebook advertisements, AUD \$58, targeted Facebook advertisements, AUD \$40, and community forums AUD \$0 per sign up. Community forums however reached only 4 eligible participants. Facebook advertisements targeting females, over 45 years, focusing on 'improving health' resulted in the lowest cost per website visit (AUD \$0.66) and sign ups (AUD \$35). The participants reached through web-based methods were significantly older ($M=57\pm8.82$) than participants reached through print methods ($M=45\pm13.04$). This may be due to the Facebook advertisements which more successfully targeted older adults.

Conclusions: Overall web-based methods were more cost-effective than print-based methods to attract people to a web-based PA intervention. Facebook in particular was a low cost and efficient method. However, creating targeted advertisements that don't result in a biased sample is a challenge of Facebook advertising.

P3.112

Steps to Treat Type 2 Diabetes: A Pilot Study in a Low Socioeconomic Area of Southern Spain

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Aim: To test the feasibility and effectiveness of a behavioral theory and pedometer based intervention to increase physical activity levels among a group of people with type 2 diabetes living in a low socioeconomic area of Southern Spain.

Methods: A pre-experimental design (pre to post) was conducted with 19 volunteers with type 2 diabetes. The intervention took part over a 12-wk period (here are presented data on the first 5 weeks) in 2014. A clinical exercise physiology practitioner met participants once per week (60 minutes each session). Different behavioral technics were applied to increase physical activity levels of participants in the study. At the very beginning of the intervention participants were given a pedometer and were informed about how to use it. The main goal that was given to the participants was to increase the number of steps without any specific goal in terms of number of steps they should daily reach. In each session, number of steps was reviewed to check if the goal was reached or not. Potential barriers were then discussed. Outcome measures were number of daily steps, daily covered distance, and fasting blood glucose. The effects of the intervention on those outcomes were tested and the relationship between changes in outcomes was reported.

Results: After 5 weeks, participants of the study increased daily steps (+ 3840 steps) and daily walked distance (+2 km). Fasting blood glucose decreased at 5-week (- 20 ml/d). A relationship between the change in number of steps and the change in fasting blood glucose was found ($r^2 = 0.73$).

Conclusions: The preliminary results suggest that the intervention works toward increasing the number of steps done by participants in the study and suggest that the intervention is effective on managing type 2 diabetes by reducing fasting blood glucose at 5 week. Long-term effects have to be explored.

P3.114

Exploring associations between parental and peer variables, personal variables and physical activity among adolescents: a mediation analysis

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: This study aimed to investigate how parental and peer variables are associated with moderate- to-vigorous intensity physical activity (MVPA) on week- and weekend days among Australian adolescents (13-15y), and whether perceived internal barriers (e.g. lack of time), external barriers (e.g. lack of others to be physically active with) and self-efficacy mediated these associations.

Methods: Cross-sectional data were drawn from the Health, Eating and Play Study, conducted in Melbourne, Australia. Adolescents (mean age = 14.11 ± 0.59 years, 51% girls) and one of their parents completed a questionnaire and adolescents wore an ActiGraph accelerometer for a week (n = 134). Mediating effects of perceived barriers and self-efficacy were tested using MacKinnon's product-of-coefficients test based on multilevel linear regression analyses.

Results: Parental logistic support was positively related to MVPA on weekdays ($\tau = 0.035$) and weekend days ($\tau = 0.078$), peer interest ($\tau = 0.036$) was positively related to MVPA on weekdays, and parental control ($\tau = -0.056$) and parental concern ($\tau = -0.180$) were inversely related to MVPA on weekdays. Internal barriers significantly mediated the association between parental logistic support and MVPA on weekdays (42.9% proportion mediated). Self-efficacy and external barriers did not mediate any association.

Conclusions: Interventions aiming to increase adolescents' MVPA should involve parents, as parental support may influence MVPA on weekdays by reducing adolescents' perceived internal barriers. Longitudinal and experimental research is needed to confirm these findings and to investigate other personal mediators.

P3.115

Association between perceived socio-environmental factors and physical activity in Czech, German and Polish adolescents

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SIG: Yes, Policies and environments

Awards: No

Objective: The purpose of this study was to examine the association between perceived socio-environmental factors and meeting the moderate-to-vigorous intensity physical activity (MVPA) recommendation among adolescents in three European countries: Czech Republic, Germany, Poland.

Methods: Data were collected from 11-, 13- and 15-year olds by means of standardised self-reports within the 2013/14 cross-national Health Behaviour in School-aged Children survey (HBSC). Compliance with the recommendation of a minimum of 1 hour/day of MVPA served as the dependent variable. Seven items of the perceived environment (safety [1 item], social [2], built [2], parental rules [2]) were used as independent variables. These items have been previously validated within the European Youth Heart Study. Separate logistic regressions for each variable were computed, adjusted for sex, age and family affluence.

Results:

The following findings should be considered preliminary since not all procedures of the international HBSC 2013/14 dataset have been finalised. Adolescents from the Czech Republic: n=4410 (48.8% boys), Germany: n=5961 (50.9%) and Poland: n=4545 (49.8%) aged 11-, 13- and 15-year old were included. The prevalence of adolescents meeting PA recommendation was low in all three countries: 21.2% [Czech Republic], 15.5% [Germany] and 24.2% [Poland]. We found a significantly positive association between the social environment in terms of significant others nearby or at home to play with and the PA recommendation in all countries (Odds Ratio [OR] ranging from 1.27 to 1.44). The built environment (schools with playgrounds or playground/parks close to home) was significantly related to PA in the Czech Republic (OR=1.18) and Germany (OR=1.18). Perceived safety was only significantly associated with PA in the Czech Republic (OR=1.27). Parental rules for going out from home were not significantly associated with PA recommendation in any of the countries.

Conclusions:

The most consistent environmental factors of meeting MVPA recommendation among adolescents in three European countries are connected to the social environment. Since the association between built environment as well as safety with PA varies between the countries, it might be important to understand these environmental features within its cultural and country-specific infrastructures and conditions. The parental rules for going outside appeared unimportant among this age group.

P3.116

Digital interventions in self-determined exercise motivation - interdisciplinary innovations.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose:

There is a need for scientifically sound and theory based tools and services in e-health. In this project knowledge from the field of psychology will be complemented by expertise in information technology and innovation science in designing a digital intervention based on Self-determination theory (SDT) aiming to facilitate exercise motivation.

Methods:

The intervention will be tested by a three wave RCT design in a population of e-health clients (n = 200) in a web based exercise service. Sensors (step counters) and self-reports (Godin Leisure-Time Exercise Questionnaire) will be used to measure objective and subjective exercise behavior while instruments based on SDT (Basic Psychological Needs in Exercise Scale and Behavioral Regulation in Exercise Questionnaire-2) will measure factors related to motivation. Advanced mediation variable analyses (MVA) and latent growth curve models (LGCM) will be used to explore motivational processes, changes and profiles in relation to exercise behavior.

Expected Results:

Based on the SDT process model, it is hypothesized that a (digital) environment supporting basic psychological need satisfaction will facilitate internalization and enhanced self-determined motivation, which in turn will have a positive effect on exercise behavior.

Conclusions:

Clarifying mechanisms and indirect effects provide knowledge of how intervention effects could be interpreted and understood. Combining high level research design like RCT and advanced analyses as MVA provides valuable contributions to the understanding of theoretical mechanisms of motivation that could inform the tailoring of effective interventions promoting healthy exercise behaviours. In addition, the project might form a prosperous interdisciplinary fusion generating innovative and theory based digital solutions for e-health.

P3.117

Changes in mode of transportation to work or school from pre-pregnancy to early pregnancy in the Norwegian Fit for Delivery study

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SIG: Yes, Children and families

Awards: No

Purpose: Reduction in the amount and level of physical activity is the norm from pre-pregnancy into pregnancy. Active transportation (walking, biking and public transport) is a feasible way to incorporate physical activity into daily life and has substantial environmental benefits. Furthermore, people who use active modes of transportation to work seem to increase their daily level of physical activity compared to those who use private transport. We wanted to describe changes in mode of transportation to work or school from pre-pregnancy to early pregnancy, and examine associations with educational level.

Methods: Between September 2009 and February 2013, 606 healthy pregnant nulliparous women were included into a randomised controlled trial (The Norwegian Fit for Delivery trial). At inclusion in median gestational week 16 (range: 9-20) the women reported their current and their pre-pregnancy mode of transportation to work or school. Data were analysed by multilevel mixed models with dichotomized modes of transportation as dependent variables.

Results: Pre-pregnancy, 58% used private transport to work or school, compared to 64% in early pregnancy ($p=0.001$). The percentage of women who biked decreased significantly from pre-pregnancy to early pregnancy (11% v. 5%, $p<0.001$), while the percentage of women who walked (10% v. 8%, $p=0.239$) and used public transport (22% v. 24% $p=0.267$) were not significantly different comparing pre-pregnancy to early pregnancy. From pre-pregnancy to early pregnancy lower-educated women increased their use of public transportation compared to higher-educated women, and higher-educated women increased their use of private transportation compared to lower-educated women.

Conclusions: Private transport was the dominant mode of transportation to work and school both pre-pregnancy and in early pregnancy. Furthermore there was a change towards less active transportation in early pregnancy. Walking and biking for transportation are practical and effective ways to engage in physical activity. Thus, encouraging women to continue with or initiate active travel in early pregnancy might be one approach to maintain and even increase physical activity levels in pregnancy.

P3.118

"Putting school travel on the map": Facilitators and barriers to effective school travel planning implementation in Canada

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Introduction: A School Travel Planning (STP) model is the most common approach in Canada for promoting active school travel (AST) among elementary school children. However, evaluations regarding its effectiveness are limited. This is the first study to qualitatively explore facilitators and barriers to effective implementation.

Methods: Telephone interviews were conducted with 34 STP 'facilitators' from seven Canadian provinces. Participants were predominantly female, occupied within the health sector, and had implemented STP in the province of Ontario. Participants were interviewed regarding: i) perceptions of STP success; ii) the facilitators and barriers to effective STP implementation; and iii) recommendations for improving STP in Canada. A thematic analysis was employed to inductively code and categorize raw data units into themes.

Results: All facilitators perceived STP to be successful in their respective schools although definitions of 'success' varied. Factors facilitating effective STP implementation included the well-designed STP model, multidisciplinary collaboration between community and school-level stakeholders, and the facilitators' leadership role. Conversely, the lack of stakeholder involvement at some schools, from principals, parents, and students, was identified as a barrier to effective implementation. However, the primary factor that hindered effective implementation was the lack of time given by funding organizations to implement STP. To observe more sustainable STP interventions in Canada, the facilitators acknowledged the pressing need of government funding (i.e., Federal, Provincial/Territorial, Municipal) to support STP interventions by developing the appropriate infrastructure needed for AST, funding facilitators, and implementing policies that enable greater AST.

Conclusion: This novel study contributes important insight into the STP process. STP was considered primarily successful by starting a conversation about school travel among community and school-level stakeholders that lead to multidisciplinary consideration of potential solutions to promote AST. However, there was also some evidence to suggest that the existing STP model is likely a short-term 'band-aid' solution to increase AST given the lack of time and sustained funding to support its implementation. Findings further call for greater investment in resources and capacity to support STP interventions across all levels of government.

P3.119

Combining 4-weeks of high intensity interval and continuous exercise in overweight and obese males does not alter NEAT

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective: To assess the effects of combining 4 weeks of high intensity interval (HII) and continuous exercise on VO₂max, health markers and non-exercise activity thermogenesis (NEAT) in overweight and obese males.

Methods: Fifteen males (BMI: 29.7 ± 3.3 kg/m²) completed a 4-week exercise intervention, consisting of alternating sessions of time-matched continuous (50% VO₂max) or HII (30 second intervals at 100% VO₂max) exercise sessions on a cycle ergometer, five times per week. Body composition was assessed by air displacement plethysmography, VO₂max by indirect calorimetry and NEAT by accelerometry. Heart rate, ratings of perceived exertion (RPE) and blood pressure were also assessed.

Results/Findings: Body weight (-0.9 ± 1.1 kg), waist circumference (-2.3 ± 3.5 cm) and percent body fat (-0.9 ± 1.1 %) were modestly reduced, while fat free mass was maintained after the intervention. Systolic (-6.2 ± 8.4 mmHg) and diastolic (-5.8 ± 2.2 mmHg) blood pressure were significantly reduced and VO₂max increased (+4.4 ± 2.1 ml/kg/min) by 12.8%. NEAT did not differ in the final week of intervention (week 4) compared to baseline, and did not differ in the 24 hours after a continuous compared to a HII exercise session.

Conclusions: A combination of continuous and HII exercise has beneficial effects on body composition, blood pressure and VO₂max in overweight and obese males and appears not to alter NEAT. In addition, combining both types of exercise provide variety. Randomized controlled trials directly examining the efficacy of a combination of continuous and HII exercise compared to continuous and HII exercise only interventions would be of interest for future investigations.

P3.120

Relationship between self-determined motivation towards physical activity and physical fitness among university students

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Purpose: Some students experience a significant amount of weight gain during university life. Decreased physical activity is certainly involved in this weight gain. As physical activity plays an important role in the health and well being, it is important to support implementation of strategies aimed at helping young adults to achieve or maintain physical activity recommendations. In this regard, it has been proposed that autonomously motivated exercise behavior contributes to improved physical activity level. Thus, the objective of this study was to investigate the relationship between self-determined motivation towards physical activity and physical fitness.

Methods: For that purpose, self-determined motivation towards physical activity was evaluated in a sample of 78 university students (55 women and 23 men) from 18 to 30 years of age (20.7 ± 2.0 years). Adiposity indices, cardiorespiratory endurance, muscular strength and muscular endurance were also measured.

Results/Findings: As a group, subjects were not obese and were not characterized by a poor physical fitness. However, men have a better physical fitness compared to women (p<0.03). Both men and women have a self-determined motivation for physical activity (22.7 ± 9.7 and 19.5 ± 10.0, respectively) with no significant difference between men and women. In order to further explore the contribution of self-determined motivation to physical activity on physical fitness, men and women were divided as having lower or higher autonomous motivation (using the 50th percentile). Adiposity indices (BMI, fat mass and waist circumference) were significantly higher in women with lower self-determined motivation towards physical activity (p<0.05). Furthermore, women with lower self-determined motivation also presented a poorer physical fitness (cardiorespiratory endurance, muscular strength and muscular endurance) compared to women with higher self-determined motivation towards physical activity (p<0.006). However, this relationship was not observed for men.

Conclusions: University life is a critical period of risk for weight gain. Although several factors are certainly involved in this weight gain, this research provides further support for the need of developing strategies aimed at helping university students to improve their autonomous motivation towards physical activity.

P3.121

Pregnancy and Exercise: An In-Depth Review of the Historical and Modern Viewpoints on Prenatal Fitness

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Objective:

What are the limits of physical training during pregnancy? It is accepted that prenatal exercise provides the mother with positive physical and physiological effects (Clapp & Little, 1995). However, one of the gaps in research are the upper limits of exercise frequency and intensity required to potentially render a negative effect, if any. It is hard to ignore the growing participation of pregnant women in sports and fitness activities, particularly in the area of high-intensity, functional training.

Methods:

This paper takes a qualitative exploring the discourse on prenatal exercise. It begins with a literature review of the shifts in medical opinion and its relation to socio-cultural trends, notions of power, and control over the female body during the different decades beginning with the 1950s until the present. Discourse analysis is conducted from questionnaires, observation, and anecdotal experience gathered from three participants who engaged in high-intensity, functional training during their pregnancies. The aim of this paper is to bring awareness to the idea that most of our notions regarding "safe" exercise during pregnancy are hypersensitive and dated.

Results:

Analysis of the questionnaires and the observational experience reveal some common themes amongst the three participants. The expectant mothers all expressed that never did they feel their fetuses or themselves were put at risk by engaging in high-intensity, functional training. A positive mental state of mind is also revealed as a common theme, as well as a consistent positive body image during the pregnancy. Each participant also stated they would partake in high-intensity, functional training for future pregnancies.

Conclusion:

Scientifically valid experimentation through randomized controlled trials may never be feasible for studying this special population due to ethical reasons. However, this research indicates that women are capable of tolerating much more exercise intensity without harmful consequences than what was once thought. Most prenatal exercise research is limited, dated, and has not been particularly neutral or objective (Jette, 2011). Observational, case study, and anecdotal evidence should continue to be used as methods of research for this growing, special population.

P3.122

School neighborhood built environment characteristics associated with physical activity behaviors and mediators in urban youth

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Benefits of physical activity (PA) for health and wellbeing are well established and many school-based interventions promote PA, yet little is understood about how built environments around schools relate to elementary school-aged youth's PA. The purpose of this study was to examine the associations of school neighborhood built environment characteristics with PA behavior and psychosocial mediators.

Methods: Data was collected from 5th grade students at 20 public elementary schools in New York City (n=952) with a self-report questionnaire to measure PA behaviors and theory-based psychosocial mediators (self-efficacy, behavioral intention, habit strength), as baseline data from Food, Health & Choices a school-based childhood obesity prevention study. School neighborhood built environment characteristics data (park access, public transportation density, walkability and total crime) were obtained through local government agencies for the area surrounding the school designated as the attendance zone. Data analyses were performed for boys and girls separately using multilevel linear regression models (HLM version 7.0).

Results: For boys, there were significant negative associations between PA duration and total crime ($\beta = -0.0045$, $p = 0.012$). Medium PA frequency was negatively associated with public transportation density ($\beta = -0.0076$, $p = 0.028$) and positively associated with park access ($\beta = 0.0048$, $p = 0.026$). Girl's light PA frequency was positively associated with park access ($\beta = 1.5517$, $p = 0.045$). For mediators, behavioral intention and habit strength were negatively associated with total crime, and habit strength was positively associated with public transportation density for boys ($p < 0.05$). These findings were not consistent for girls. Walkability was not associated with any outcome variables. Heavy physical activity, typically sports teams and other organized activity, was not associated with any environment characteristics.

Conclusions: The built environment surrounding schools appears to be associated with physical activity behaviors and psychosocial mediators. Partnerships between those in public health and public policy with school administrators could shape the school neighborhood, specifically related to decreasing crime rates and increasing park access to promote PA in school-aged youth. Additionally, it is warranted for those who conduct school-based interventions that promote PA to learn about the environment surrounding their schools and use this to shape how they approach PA in their interventions.

P3.123

Mediators effecting moderate-to-vigorous physical activity and inactivity for girls from an intervention program delivered in an organised youth sports setting

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: There is a need to evaluate strategies for increasing moderate-to-vigorous physical activity (MVPA) in organised youth sport (OYS). The purpose of this study was to test two separate models where it was hypothesised that coaches' physical activity (PA) levels, lesson context (management, knowledge delivery), and coaches' behaviours (promoting PA, demonstrating PA, discouraging PA) mediated the effect of players' MVPA (Model 1) and inactivity (Model 2).

Methods: Participants were 76 girls, (aged 9-12y, mean±SD 10.5±1.0y) and 8 coaches (aged 18-21y, mean±SD 19.3±1.1y). A 5-day basketball program was delivered where the intervention group received coaching from coaches who attended two coach education sessions versus a no-treatment control group. Coach education sessions were designed to increase MVPA and decrease inactivity of participating players during training. Each player and coach wore an accelerometer from baseline (day 1) to follow-up (day 5). The System for Observing Fitness Instruction Time was employed to generate lesson context and coach behaviour data. Multilevel mediation models were used to explore the research hypotheses.

Results: In Model 1, the intervention effect on all proposed mediating variables was significant ($p<0.05$). There was a significant effect between coach MVPA and player MVPA (coeff= 0.26, 95% CI=0.14 to 0.38) which coincided with a significant indirect effect (coeff= 1.80, 95% CI=0.85 to 2.85). The relationship between all remaining mediators and changes in player MVPA were not statistically significant. In Model 2, the intervention effect on coach inactivity, management, and knowledge delivery was significant ($p<0.05$). Of the aforementioned mediating variables, only coach inactivity was significantly linked with player inactivity (coeff= -0.23, 95% CI= -0.14 to -0.31). Decreased coach inactivity significantly mediated the effect of the intervention on player inactivity (coeff= -3.20, 95% CI= -0.14 to -0.31). No significant effects were found on any path of the mediation model for discouraging PA.

Conclusion: A significant intervention effect was found for all hypothesised mediators except coaches' discouraging PA behaviour. Additionally, coach MVPA and inactivity significantly mediated the effect of the intervention on player MVPA and inactivity, respectively. OYS may present an important opportunity for researchers to concurrently promote players' and coaches' MVPA as they appear to be linked.

P3.124

'At least 50% of young people experiencing a first episode psychosis should be engaged in age-appropriate physical activity'. Achieving a Healthy Active Lives target for physical activity participation

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Physical inactivity is a critical, modifiable risk factor contributing to the 'scandal of premature mortality' for people experiencing psychotic illness. Despite the numerous physical, and mental health benefits of physical activity (PA) including a reduced burden of cardiometabolic disease, and improved symptomatology, people experiencing psychosis are less likely to be physically active. Delivering PA interventions to young people experiencing first-episode psychosis (FEP) is pivotal to achieving the Healthy Active Lives 5-year targets for age-appropriate physical activity goals (Shiers & Curtis, Lancet Psychiatry, 2014).

Methods:

We conducted a systematic review to identify the program variables associated with physical activity interventions in FEP. From 1,190 records identified, 105 articles were assessed. After excluding articles that did not examine FEP participants (n=66), did not involve an intervention (n=18), did not involve a PA component (n=5) or where data had been reported elsewhere (n=5), eleven eligible studies remained.

Results:

PA intervention variables that were identified included program duration, physical activity/exercise modality, intensity, session/ bout duration and frequency, group or individualized mode of delivery, qualification of instructors/clinicians, and outcomes assessed. Among the small number of eligible studies identified, a wide variety of PA interventions were employed, including supervised 'lab-based' prescriptions, yoga, mobile phone apps and motivational programs. Few studies specifically assessed PA participation as an outcome measure.

Conclusions:

No clear gold-standard method of increasing physical activity among people experiencing FEP was identified in the existing literature. Future research should focus on PA interventions that reflect core principles of exercise science incorporating progressive overload, aerobic and resistance components as well as individualised and tailored sessions.

Reference: Shiers, D & Curtis, J (2014) Cardiometabolic health in young people with psychosis. *Lancet Psychiatry*, 1, 492-493.

P3.125

Physical activity, health and quality of life among those experiencing, or at risk of homelessness in an urban setting.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Objective: In middle-high income countries, the least well off suffer the greatest burden of non-communicable disease and lowest levels of physical activity (PA). People at risk of/experiencing homelessness are among the most disadvantaged, yet little is known about PA, health and quality of life (QOL) in this population.

Methods: The PRECEDE PROCEED model informed a descriptive, correlational design to examine associations between PA (Validated Single Item and IPAQ Long), cardiovascular disease prevalence and risk (ESSA Screening tool), mental health (K10) and QOL (SF12) among adults at risk of/experiencing homelessness, frequenting an urban social service provider. A preliminary analysis for eight (target sample 40) participants is presented.

Results: Participants were mostly male (75%; 50.0 ± 15.1 yrs), with > 12 years education (75%), unemployed (62.5%), in social housing (62.5%), with 37.5% considered homeless (crisis accommodation). Physical (36.2 ± 11.0) and mental (41.2 ± 13.0) health-related QOL were below norm. Risk of anxiety/depressive disorders was moderate (K10; 25.8 ± 12.1). Prevalence of cardiovascular disease was high (75%) with an average of 3.3 ± 2.0 cardiovascular risk factors. Single item PA (62.5%) and IPAQ (28.6%) measures differed markedly in terms of those categorized as insufficiently active. Most PA occurred in the transport domain (2459.6 ± 3195.1 met/mins), then recreation (676.0 ± 771.3 met/mins), household (232.9 ± 344.6 met/mins) and work (0.0 ± 0.0 met/mins). One over-reported IPAQ dataset was removed. Significant negative associations existed between; physical QOL and cardiovascular risk factors ($r = -0.76$, $p < 0.05$); mental QOL and K10 ($r = -0.73$, $p < 0.05$); single item PA and cardiovascular risk factors ($r = -0.71$, $p < 0.05$).

Conclusion: This study demonstrates a high disease burden, and low QOL for those at risk of/experiencing homelessness. Investigations into cardiovascular disease risk factor reduction for health benefits are indicated. Significant challenges remain however, in obtaining valid and reliable PA measures in disadvantaged populations. Evidence suggests that the IPAQ over-estimated PA, yet elicited vital active-transport information not reported in the single item question.

P3.126

Sport in people aged 50+ years: participation, types of sport and contribution to health enhancing physical activity

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: The proportion of people doing sufficient physical activity (PA) for health benefits decreases with age. Sport clubs may provide an encouraging setting for people to keep active as they age. However, little is known about sport participation in people aged 50+ years, what sports they play, if they play in clubs, and the contribution of club-based sport to health-enhancing PA levels in this age-group. This is examined in this study.

Methods: Data were used from 8,596 Australian adults aged 50+ years, who participated in the 2010 phone-based Exercise, Recreation And Sport Survey (ERASS). They responded to questions about the types of activities they did in the last year, and the setting and frequency of these activities. Activities were classified as sport if they were administered by a state or national Australian sporting association. Furthermore, only activities of at least moderate intensity (≥ 3.5 metabolic equivalents) were classified as health-enhancing. Data were analysed using descriptive statistics.

Results: Overall, 76.4% of respondents participated in some PA in the past year. Of these, 40.7% participated in organised activity, of which 30.3% was club-based. The most frequently played sports, played by more than 5% of men and women who did club-based activities, were golf, lawn bowls and tennis. Larger proportions of men (67.6%) than women (40.5%) reported participation in club-based sports. Respondents collectively reported 10,607 types of health-enhancing activities in the previous year. Of these, 37.8% ($n=4,006$) were sports activities and 62.2% were non-sport activities. The proportion of all health-enhancing activities that were sport activities was 1.5 times higher in men than in women (45.5% in men; 29.9% in women, $p < .001$). Of all health-enhancing sports activities, 28.5% ($n=1,143$) were club-based and 78.9% ($n=3,148$) were done at least 12 times/year.

Conclusion: Sport contributes to almost half of the health-enhancing PA in men and one third in women aged 50+ years. However, just over 10% of all health-enhancing PA was club-based sport. Thus, there is potential for sporting clubs and organisations to develop and implement sport-based programs to increase PA participation in adults aged 50+ years.

P3.127

Social Ecological Intervention to Promote Active Commuting to Work in Finland

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Objective:

Cycling and walking to work is a natural way of increasing physical activity in working population. However, the evidence on the effectiveness and cost savings of promoting active commuting is thin. This study is a cluster-randomized, controlled trial aiming to promote active commuting to work with environmental, social and behavioral strategies in a large workplace area in Tampere, Finland.

Methods:

Recruitment of the workplaces for the study has started in September 2014. In the first phase of the study a quality pathway for walking and cycling through the workplace area will be built. Its effects on active commuting to work and travel routes are assessed after immediate and mid-term (6 months) exposure with the same measures as at baseline before the construction work (questionnaires, travel diaries, accelerometers, Geographic Positioning System, traffic calculations and auditing). In the second phase, the workplaces are randomly assigned to intervention and comparison group. Each workplace in the intervention group is supported to develop and implement multilevel strategies to promote employees' active commuting to work. The effects are assessed after immediate and mid-term exposure with the same measures as at baseline and after the quality pathway. Health Economic Assessment Tool for Cycling and Walking is used to assess cost savings of the intervention after the environmental change and the social and behavioral strategies. The process and impact evaluation will be conducted by utilizing RE-AIM and MaxSumo. Workplaces in the comparison group will be offered the same support as for intervention workplaces at the end of the study.

Results and Conclusions:

The study has started in September 2014 and majority of the findings will be reported in 2017. The number of workplaces participating in the study will be approximately 15 with the total number of 1500 employees. The study initiates interdisciplinary collaboration between the experts of transportation, urban planning and physical activity promotion, which is a novel approach to promote active travel in Finland and highly warranted both nationally and internationally. The findings thus benefit all stakeholders interested in promoting active commuting to work in urban context.

P3.128

Assessing the relationship between the physical and mental health of school-aged adolescents in a post conflict setting: a case study in Kilinochchi, northern Sri Lanka

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose:

Adolescent and Child mental health (MH) is under-researched, particularly in low and middle-income countries, and a crucial component of wellbeing. Exposure to conflict, and post-conflict environmental stressors are well-recognised risk factors for poor adolescent MH. Despite this, research in this context remains scant. Coordinating an appropriate response to the challenges that mental disorders present requires an understanding of determinants, resources and effective interventions that influence MH

There is a growing body of evidence for various positive impacts of sport and PA on the physical, mental and social wellbeing of young people in peaceful settings. The focus of this research was to assess the relationship between physical fitness and mental health in adolescents in a post conflict setting.

Methods:

The case study site selected was Kilinochchi district, northern Sri Lanka. 539 adolescents aged between 12-13 years across 10 schools were assessed for physical and mental health parameters in a cross sectional study. Schools were stratified by type (1AB, 1C and ii) and randomly sampled according to the ratio they existed in the district.

Physical health was assessed using the Multi stage fitness test (MFT) and BMI for age (BMI). Mental health was assessed using a validated, emic measure of psychosocial health, the 'Sri Lankan Index for Psychosocial Stress - Child Version' (SLIPS-C).

Results:

The mean MFT and BMI score for girls were 3.9 (95% CI: 4.0, 3.8) and 21.5 (95% CI: 21.1-21.9), respectively. The mean MFT and BMI for boys were 5.5 (95% CI: 5.3-5.8). The mean SLIPS-C score was 61.6 (95% CI: 58.9-64.4) for girls and 63.4 (95% CI: 64.5 -70.3) for boys. The correlation coefficients (CC) for MFT:SLIPS-C score were -0.197 for boys and -0.013 in girls.

Conclusions:

Adolescents in Kilinochchi district are of a healthy weight. The study identified a weak correlation between fitness and positive mental health score in boys. This relationship is not seen in adolescent girls. Repeat measures are required to further elucidate the relationships between fitness and mental health in this context initially identified in this cross sectional study.

P3.129

The Role of the Primary School Day in the Promotion of Children's Physical Activity Levels

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Objective:

The aim of the research was to measure the physical activity (PA) levels of children throughout the primary school day, including physical education (PE) lessons, and to explore teachers' perceptions of children's PA opportunities. The school environment has been placed at the forefront of preventative public health as a key setting to increase children's PA levels (Hyndman *et al.*, 2014). Understanding children's PA behaviours during the school day can help to inform future interventions. The study addresses the need for mixed method research designs, utilising both quantitative and qualitative data.

Methods:

Full data were obtained from 96 children (aged 7-9 years) and 7 teachers across two primary schools within the West Midlands (UK). Data were collected during April - July 2014, through a convergent parallel mixed methods design. School day PA behaviours were assessed using pedometer step counts and the System for Observing Fitness and Instruction Time (SOFIT). Individual semi structured interviews were employed to explore teacher's perceptions of barriers to children's PA behaviours at school. Descriptive statistics and t-tests were used to analyse the quantitative data and Interpretative Phenomenological Analysis (IPA) was used to analyse the interview transcripts.

Results/findings:

Children accumulated an average school day step count of 6187 (+1539) for boys and 4821 (+1717) for girls. With significant gender differences in total school week step count ($t(94) = 4.09, P < 0.001$). SOFIT findings indicated that the average length of a PE lesson was 38.6 + (6.68) min, in which children were engaged in MVPA for 42.37+ (12.49) % of the lesson time. The teachers reported a number of barriers that schools face when trying to promote children's physical activity including: limited subject knowledge, low confidence and curriculum restrictions.

Conclusions:

The low number of steps accumulated reinforces the need for intervention research to promote children's school day PA. Future interventions need to draw upon both qualitative and quantitative data in order to gain a greater understanding of the restrictions placed upon schools which limit their ability to promote an active school environment.

P3.130

Sophia Step Study- a structured behavior-change-program focusing on physical activity in persons with pre-diabetes and type 2 diabetes

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SIG: Yes, Motivational Dynamics

Awards: No

Objective:

The purpose is to describe Sophia Step Study- a behavior-change-program at two levels aimed for the primary care to support patients with pre-diabetes and type 2 diabetes to increase their physical activity level. The hypothesis is that both intervention levels have effect on physical activity, metabolism and cardiovascular risk factors, with the more intense intervention having superior effects.

Methods:

The Sophia Step Study is a randomized controlled trial and participants are randomly assigned to either a multicomponent intervention group (A), a pedometer group (B) or a control group (C). In total, 310 patients will be included and followed for 24 months. Group A are offered a pedometers and a website to register and follow their own steps, physical activity on prescription with yearly follow ups, motivational interviewing (10 occasions) and group consultations based on the Transtheoretical model (including walks, 12 occasions). Group B are offered pedometers and a website to register and follow their own steps. Group C are offered usual care. Both the multicomponent intervention (group A) and the pedometer intervention (group B) is using several techniques for behaviour change such self-monitoring, goal setting, feedback and relapse prevention.

Measurements are made at week 0, 8, 12, 16, 24, month 9, 12, 18 and 24, including metabolic and cardiovascular biomarkers (HbA1C as primary health outcome), accelerometry, daily steps and questionnaires evaluating; dietary intake, physical activity, perceived ability to perform physical activity, perceived support for being active, quality of life, anxiety, depression, well-being, perceived treatment, perceived stress and diabetes self-efficacy.

Results:

The study started 2013 as a pilot study with 16 participants and acceptability and feasibility in the primary care setting was established. To date 83 patients have been enrolled.

Conclusions:

Sophia Step Study is a two-year intervention using mixed approaches and we expect that this may enhance the likelihood of maintenance of increased physical activity and long term effect on health parameters.

P3.132

Impact of simple written exercise prescriptions in primary care: A systematic review

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Primary care is regarded as an essential component of a comprehensive strategy to increase population-level physical activity (PA) (Foster et al., 2005). Previous research suggests that PA counseling by physician directly and positively impacts patients' behaviours (Ribero et al., 2007; Pinto et al., 1998). While support mechanisms through patient counseling may be related to uptake and maintenance of PA, support in the context of family medicine poses a number of challenges – in particular, physician demands and time pressures. The current study is a systematic review of a more practical way of integrating PA promotion in primary care, using short written exercise prescriptions for adult patients.

Methods: Fourteen studies (5 high quality) met the inclusion criteria, including: a short written prescription given to patients (with minimal counseling); a sample absent of specified chronic conditions; and a mean sample age between 18-to-65 years. In order to assess bias and assess study quality, the Effective Public Health Practice Project tool was used.

Findings: All studies included were either prospective studies (n=3; 21%) or controlled clinical trials (n=11; 79%). Results found that a simple exercise prescription was modestly effective in increasing patients' PA both in the short-term (6 of 7 studies, 86%; follow-up < 12 months) and long-term (7 of 7 studies, 100%; follow-up > 12 months). A simple exercise prescription was also related to improvements in physical fitness (2 of 3 studies; 67%) and health-related quality of life (3 of 4 studies; 75%); however, was not consistently related to other health outcomes (weight, blood pressure, cardiovascular risk).

Conclusions: Indeed, a brief physician-based intervention can be effective in increasing population-level PA, physical fitness, and quality of life. There was, however, considerable heterogeneity in the self-reported PA measures used, and no study that used objective PA measures. Future research must better understand the impact of a brief written prescription using objective measures of PA and longitudinal analyses, as well as the effect of an exercise prescription in combination with other pragmatic support mechanisms.

P3.133

Moderate Physical Activity Level Is Associated With SPPB In Not Disable Community-Dwelling Elderly

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Early Career Award

Purpose: To determine the relationship between physical function and objectively measured physical activity in daily life.

Methods: Data from 197 participants at InCHIANTI-FU4, 102M and 95F, 79.5±6.3ys (range 65-92ys) with MMSE≥24, no ADL disability, able to maintain balance for 10 sec in semi-tandem stance. Physical function was assessed according to Short Physical Performance Battery (SPPB). 3 groups were selected with SPPB score 12-10, 9-6 and below 6. Daily activity was recorded by 3-axial accelerometer built in Samsung Galaxy SII/III (S) placed in a belt pocket on the back. Only days with more than 10h of recording time over 5 days period were considered. Moderate intensity activities in daily life (MIA, min/day), were obtained by the Sasaki method. MIA is time spent in activities which produces a signal consistent with walking at 1.30m/sec. Analysis was conducted by multiple linear regression models (MLRM).

Results: Well functioning older subjects use to spend in average 29.5±23.0min/day in MIA. Those in the intermediate and lowest groups use to spend in average 12.9±17.1min/day and 1.8±3.5min/day respectively (p<0.001, adjusted-R²=0.14). MLRM adjusted for multiple confounders (age, gender, MMSE, CESD, BMI, diseases and drugs) confirm the association (p<0.001, adjusted-R²=0.34).

Conclusion: The measure of physical performance is able to quantify the habitual moderate physical activity level in older subjects free of disability, independently by multiple confounders. These results underline the relevance of the physical performance in the assessment of the physical function in elderly in order to promote increased time in MIA during daily life.

P3.134

Locations of physical activity and the explanatory socio-demographic and environmental factors

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective: Physical activity is important for health and healthy ageing. However, worldwide percentages of adults meeting physical activity recommendations are low. Therefore, it is of great importance to develop adequate health policy and interventions that stimulate physical activity. One of the determinants that is seen as a facilitator, but also as a barrier to physical activity is the physical environment. Although there are many studies investigating the association between physical activity of adults and the physical environment, most have focused on the residential neighborhood. However, since adults spent a large amount of their time outside the neighborhood, it is important to study not solely the effect of the residential environment, but also the effect of other environments (e.g. work environment, recreational environments) on physical activity. In light of the theory of time-geography by Hägerstrand, this study aims to provide insight in how different environments for physical activity are used throughout the day. Furthermore, it is investigated what socio-demographic and environmental factors determine the locations that adults use for physical activity.

Methods: This study is part of PHASE (Physical Activity in Public Space Environments), which uses accelerometers and GPS-devices to collect objective and detailed data on physical activity of adults aged 45-65 years. Participants in Rotterdam and Maastricht (The Netherlands), wore the devices for seven consecutive days.

Results and Conclusion: Results on the locations and intensity of physical activity will be presented, as well as the explanatory socio-demographic and environmental factors.

P3.135

Longitudinal associations between social support and physical and mental health in African American adults

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: African Americans report a greater number of modifiable risk factors, such as overweight/obesity, physical inactivity and poor dietary habits, putting them at increased risk of developing and dying from chronic diseases. These risk factors are also associated with poorer health-related quality of life. The purpose of this study was to examine health-related quality of life in African American men and women over 2 years and determine how health patterns are affected by social support.

Method: African Americans enrolled in a longitudinal church-based cohort completed the 12-item Interpersonal Support Evaluation List (ISEL-12) to assess social support and the 12-item short form (SF-12) Health Survey to assess physical and mental health at baseline (Year 1) and two years later (Year 3). Linear mixed models (LMM) were used to examine physical and mental health patterns over time, adjusting for gender, age, BMI, education, income, employment and marital status, and number of children.

Results: Participants ($N=1270$) were mostly female (74.6%), middle-aged ($M=45.2$ years, $SD=12.9$) and obese (M BMI=31.6 kg/m², $SD=7.3$). Most participants were unmarried (58.4%), had 1 or more children (69.4%), and were currently employed (73.9%). Nearly half (48.5%) had a college degree, and 35.3% reported an annual household income $\geq \$80,000$. Social support significantly decreased over time ($\Delta=-2.7$, $t=-18.2$, $p<.001$) while mental health ($\Delta=1.5$, $t=4.949$, $p<.001$) improved. Changes in social support were positively associated with changes in physical (Estimate=0.173, $SE=0.028$, $p<.001$) and mental health (Estimate=0.480, $SE=0.607$, $p<.001$).

Conclusions: Changes in social support were associated with favorable changes in physical and mental health. Further research is needed to explore interactions between social support and demographics, such as gender, socioeconomic status and weight status, and potential psychosocial mediators and how they influence physical and mental health patterns in African American adults. Health promotion efforts to increase social support may positively impact physical and mental health, and interventions capitalizing on the existing support within a church-based cohort may lead to further improvement in health in African Americans, reducing health disparities.

P3.136

Effects of the Teacher-Pupil Relationship on Pupils' Motivation and Well-Being

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SIG: Yes, Motivational Dynamics

Awards: No

Objectives: To test the applicability of the 3+1Cs conceptualisation of relationships in the physical education (PE) context. To examine the influence of the quality of the teacher-pupil relationship on pupils' motivation and well-being in PE.

Method: Employing a cross-sectional research design, 377 pupils from Years 7, 8 and 9 of secondary schools in East England completed a multi-section questionnaire assessing the quality of the teacher-pupil relationship (direct and meta), self-determined motivation, positive and negative affect, self-esteem, and self-efficacy for PE.

Results: Initial analyses indicate that both meta and direct perspectives (closeness, commitment and complementarity) of the teacher-pupil relationship were positively associated with pupils' positive affect, self-esteem and self-efficacy and negatively associated with negative affect. A mediational model in which motivation mediates the effects of the quality of the teacher-pupil relationship on indicators of well-being will be tested.

Conclusions: Initial analyses suggest relationship in PE can be characterised by the constructs of closeness, commitment and complementarity. Higher quality relationships that are characterised by trust, respect and appreciation, cooperative and effective interaction and high levels of connection are important for pupils' well-being in PE. Implications for future research and physical education practice will be discussed.

P3.137

Effects of the Teacher-Pupil Relationship on Teachers' Well-Being

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Early Career Award

Objective: To examine the influence of the quality of the teacher-pupil relationship on teachers' well-being in physical education (PE).

Method: Employing a cross-sectional research design, 68 PE teachers (male and female) from secondary schools in East England completed a multi-section questionnaire assessing the quality of the teacher-pupil relationship (direct and meta perspectives), positive and negative affect and their overall well-being. The questionnaire was completed with regards to one randomly selected pupil in their class.

Results: Initial analyses indicate that the effects are different for meta rather than direct perspectives. With all three meta aspects, closeness, commitment and complementarity having a positive influence on teachers' well-being and a negative influence on their negative affect. Closeness and commitment meta perspectives also have a positive influence on the teachers' positive affect. For direct perspectives, all three aspects had a negative influence on negative affect, while closeness and commitment had a positive influence on teachers' well-being. Regression analyses will be used to determine the predictive nature of these relationships.

Conclusions: The initial analyses suggest that higher quality relationships as characterised by cooperative and effective interaction, high levels of connection and respect, trust and appreciation were important for teachers' positive and negative affect and their overall well-being. Implications for future research and for physical education teacher training and practice will be discussed.

P3.138

Move to Achieve: Establishing A Statewide Baseline of Physical Education and Physical Activity Practices and Examining Impact on Elementary Students' Academics and Health

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SIG: Yes, Policies and environments

Awards: No

Objective: Despite the well documented link between school-based physical activity and student outcomes such as higher academic achievement, improved classroom behavior, and various health indicators, schools struggle with making physical activity an integral part of their mission. In 2014, West Virginia (WV) enacted policy aimed at increasing time requirements for physical activity to supplement existing physical education requirements. To capitalize on the opportunity of this natural experiment, a study was designed to retrospectively assess existing physical education and physical activity practices in WV elementary schools and to examine these practices in relation to academic achievement, classroom behaviors, and various health indicators.

Methods: Principal reports from 2012-2013 recounting the physical education and physical activity practices, resources, challenges, and achievements were collected for all elementary schools including fifth grade classrooms. A complementary survey from principals and physical education teachers is also being collected to assess challenges associated with the new requirements. Aggregate student standardized academic test scores and behaviors (suspensions, attendance) will be compared with the principal reports to examine associations between practices and student outcomes.

Results: Data from more than 500 elementary schools (n~ 15,000 fifth grade students) will illustrate physical activity and physical education practices and their association with academic achievement, classroom behaviors, and various health indicators. Moving forward, these baseline data will enable longitudinal tracking of the impacts of the 2014 enacted additional physical activity time requirements.

Conclusions: WV is joining other states in heeding the Institute of Medicine's call for more physical activity during the school day, but has not yet established a baseline of current practices. These findings will meet that need as well as explore the implications of increasing physical activity in terms of students' academics and classroom behaviors and will outline potential practice and policy recommendations.

P3.139

CrossFit Participation Decreases Systolic Blood Pressure: an Examination by Age

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Hypertension is a key risk factor for cardiovascular problems, especially stroke, and risk increases with age. In previous research, high-intensity interval training has significantly decreased systolic blood pressure (SBP), lessening stroke risk. Exercise is one of the treatments to decrease SBP, along with anti-hypertensive drugs and dietary changes. A newer type of high-intensity exercise program, CrossFit, incorporates functional movements and temporally combines aerobic and resistance exercises. The purpose of this study was to examine the effects of CrossFit participation on reductions in SBP across age groups.

Methods: Members of a university CrossFit gym consented to participate in a 12-month program evaluation study (n=88). Age ranged from 18 to 66y (M=30±11y) and 53% were female. Sixty-minute classes were offered seven days per week. BP measurements and questionnaires were administered at baseline, 2-, 6-, and 12-months. Questionnaires asked participants to indicate their likelihood for the item "I intend to do CrossFit to decrease my BP" on a scale from -3 "very unlikely" to +3 "very likely." Data were analyzed using IBM SPSS 20. Age was dichotomized as 18-29y or 30-66y. Repeated measures ANOVA was calculated for within and between-group differences in SBP. Independent samples t-tests were used for questionnaire comparisons.

Results: Most participants that adhered for 2-months or more (69%, n=41) saw decreases in SBP throughout the study; 1.5% (n=1) maintained and 29.5% (n=17) saw slight increases. Complete data were available for 20 participants. SBP significantly decreased over time for participants, $F(3)=5.0$, $p=.004$. Although these differences did not significantly vary by age ($p=.171$), ages 18-29y saw the largest decrease in SBP between baseline to 2-months and the largest decrease for ages 30-66y was between 6- to 12-months. Ages 30-66y were significantly more likely to intend to do CrossFit to decrease BP ($t=2.1$, $p=.038$; $m=0.85\pm1.79$) than ages 18-29y ($m=-0.02\pm1.44$).

Conclusions: Participation in CrossFit exercise significantly decreased SBP for both age groups, although reductions took longer for those ages 30-66y. Since that age group was more likely to link this health improvement to exercise intentions, encouraging patience for decreases in SBP is important.

P3.140

A Scale to Assess Low-Income Tweens' Perceived Barriers To Physical Activity

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SIG: Yes, Socioeconomic inequalities

Awards: No

Objectives: To develop and validate a scale to assess low-income tweens' (children in grades 6-8) perceived barriers to physical activity (PA).

Methods: Low-income tweens (n=443) completed a self-reported survey that included 110 potential PA barrier items, a PA (PAQ-C) scale, and demographic questions. The barrier items scale's construct validity was established using principal components analysis (PCA) with varimax rotation. Cronbach-alpha scores determined the scale's internal consistency. Test-retest reliability (alpha-correlations) was assessed for a sample of 45 students who completed the survey twice in a 2-wk period. Criterion validity was established by determining the correlations between PAQ-C and barrier scale's scores.

Results: Tweens were: 67% 6th-graders, 47% males, 52% Blacks, and 16% Hispanic/Latinos. PCA yielded 5 factors and accounted for 17% of the total variance. The factors extracted were: participation in competing activities (7 items), lack of self-efficacy (10 items), personal barriers (8 items), social environmental barriers (6 items), and physical environmental barriers (5 items). Internal consistency scores of the scales were good (0.82, 0.82, 0.72, 0.70, and 0.72 respectively). The test-retest scores were acceptable (0.73, 0.65, 0.58, 0.62, and 0.54 respectively). Physical activity scores decreased as barrier scores increased (-0.34, -0.34, -0.30, -.22, and -0.21 respectively). Females had lower PA scores (3.14 ± 0.83 , $F=2.89 \pm 0.77$, $p<0.0001$, Range: 1-5) and higher PA barrier scores ($M=1.61 \pm 0.55$, $F=1.74 \pm 0.55$, $p<0.0001$, Range: 1-5).

Conclusions: Multiple, measureable barriers prevent low-income tweens from engaging in regular physical activity. However, further research is warranted to confirm the scale's validity.

P3.141

The impact of Psychological stress on Physical Activity participation: Implications for Physical Educators.

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: It is widely recognised that there is a relationship between Physical Activity (PA) and stress and that this has an effect on repelling the negative effects of psychological stress, the extant literature predominates in this area (1).

Recent literature has highlighted that the relationship between stress and physical activity are bidirectional (1). Furthermore, it has been suggested that the stress response may impede the levels of participation in PA (2). There is a paucity of evidence investigating the effects of stress on the uptake of PA.

Aim:

To determine the difference in PA levels between adolescents who have experienced greater life stress in comparison to those who have not.

To investigate the relationship between stressed adolescents and PA.

Methods:

A purposive sampling strategy was employed, with adolescents from a low SES background who had experienced life changing stress, compared with those from a background that was not deemed as underprivileged. PA patterns were measured using the 'Physical Activity Questionnaire for High School (PAQA)' (3) Stress scores were assessed using the 10 item perceived stress scale (PSS-10). Statistical analysis was conducted using SPSS V21.

Results/findings:

A significant difference was detected between groups for PA levels. PA scores were significantly different ($p<0.05$), with the low SES group significantly less active on every day ($p<0.05$) except for Saturday, where the Mann-Whitney U was found to be 31.0 ($Z=-1.594$, $p>0.05$). Furthermore, Spearman's correlation showed there was a negative relationship between total stress levels and PA during spare time ($r_s = -0.61$, $n=10$, $p= <0.05$). A similar relationship was evident for: PA levels during lunchtime, ($r_s = -0.69$, $n= 10$, $p= <0.05$), evenings ($r_s = -0.57$, $n= 10$, $p= <0.05$) and for overall PA over a seven day period ($r_s = 0.81$, $n= 10$ $p= <0.05$).

Conclusions: These findings add to the evidence that stress may impede PA uptake during the transition phases of life. Physical Educators should understand the stress remediating effects of PA, whilst incorporating more leisure based activities to promote sustainable PA targeting adolescents who have been exposed to higher stress loads during critical developmental periods.

P3.142

Increasing Physical Activity Levels among Girls in Russia: A Cross-Over Trial

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Purpose: Insufficient physical activity (PA) levels can increase children's risks for developing chronic diseases. Where both boys and girls decline in PA levels during adolescence, girls tend to decrease more rapidly and at a younger age than boys. Reducing this decline could reduce negative health consequences. The objective of this study was to determine the impact of two types of organized PA instructional conditions (structured, choice) on girls' PA levels, as compared to free play at a summer camp in Russia. We hypothesized that free play would elicit the highest levels of physical activity, based on previous literature.

Methods: This study used a within-subjects cross-over trial design. Thirty-two girls (mean age \pm SD = 10.7 \pm 0.6yr; mean BMI percentile \pm SD = 47 \pm 31) at a Russian summer camp attended daily 35-minute PA sessions for three weeks. Using the evidence-based Coordinated Approach to Child Health physical activity box, a different type of PA instructional condition (choice, structured, free play) was implemented each day. Step count data were collected with Actical PA monitors. Paired t-tests with Bonferroni correction (α = 0.05) determined differences in step counts by instructional condition.

Results: Among 32 participants, 25 attended all sessions, and 31 girls attended at least 2 of the 3 sessions for each condition. No participant missed more than two sessions in total. Both the structured (mean=1,066 steps/session; 95% CI=954-1,177; p <0.01) and choice conditions (mean=1,156 steps/session; 95% CI=1,024-1,287 steps/session; p <0.01) were significantly higher than free play (mean=758 steps/session; 95% CI=663-854). The choice condition was also significantly higher than the structured condition (p =0.015).

Conclusion: Both types of instruction were superior to free play, with choice condition highest in PA level. Although contrary to the hypothesis, our results fit with Self-Determination Theory in that providing choice may have increased enjoyment of activity, which may have facilitated higher levels of PA. Results suggest that evidence-based instructional interventions can promote PA, and adolescent Russian girls may be more active in PA sessions where instructors provide choice and loosely structured games. Future research should test applications of these findings in other settings.

P3.143

Two-eyed Seeing : Enhancing the Relevance of Physical Activity Research with Indigenous Communities

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SIG: No, this does not fit in any of the special interest groups

Awards: No

Objective: Western/Mainstream approaches alone cannot address the health disparities that are the legacy of colonization of Indigenous peoples. Culturally meaningful frameworks and decolonizing methodologies are needed to engage communities in a process of reclaiming health. The academic mainstream needs to become more welcoming of Indigenous perspectives to promote healthier communities and needs to become more involved in creating and nurturing opportunities for meaningful engagement by Indigenous peoples and communities within the academy. This presentation will present a Two-Eyed Seeing approach to physical activity research, which involves seeing from one eye with the strengths of Indigenous ways of knowing and from the other eye with the strengths of Western/Mainstream ways of knowing, as an approach to physical activity (PA) intervention and research in Indigenous communities.

Methods and Results: Drawing on examples from Communitybased Participatory Research projects conducted with different Indigenous communities across Canada, this presentation will highlight the underlying principles and methodologies employed within a Two-Eyed Seeing approach to conduct PA research with Aboriginal communities in Canada. An overview of Two-Eyed Seeing will be provided by drawing on the distinct history, values and worldviews that underlie each perspective. Next, examples of research methods being applied within the context of PA intervention research in Canada will be discussed.

Discussion and Conclusions: Strategies for enhancing awareness of and appreciation for Two-eyed seeing will be discussed.

P3b.22

Nutritional quality of meals offered to young adults and comparison with meals available in the five largest chain restaurants in the UK.

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SIG: Yes, Policies and environments

Awards: No

Objective: Eating out of home has been associated with the increasing prevalence of obesity. Chain restaurants have been particularly criticised both for the food they provide, provide and the way they advertise their products especially to children. Chain restaurants account for only approximately 25% of the total sales of food eaten outside home, while small independent catering facilities account for the remaining 75% in the UK. More importantly, catering facilities in institutions such as universities, hospitals, and schools that usually provide more than one meal/day to service users are not subject to any nutritional control posing a greater risk for the development of obesity and diet-related diseases. While some chain-restaurants provide nutritional information for their products, smaller independent catering facilities usually do not. The study aimed to assess the nutritional suitability of meals provided to young adults at an independent catering facility and compare them with meals provided by chain restaurants.

Methods: Analysis of meals provided to students in catered hall of residence and comparison with menus from the five largest chain-restaurants in the UK in relation to targets for macronutrients and micronutrients

Results: 2,056 meal-combinations were analysed, 210 from the independent restaurant and 1,846 from five largest national chain-restaurants in the UK. Outlets of all these five chain-restaurants were in a radius of one mile from the independent catering facility. Mean (SD) nutritional content was; independent restaurant: 1193(269)kcal, fat 52.0(22)g, saturated fat 24.5(14.5)g, protein 42.4(28.5)g, carbohydrate 117.0(30)g, chain-restaurants: 922(160)kcal, fat 40.0(9.7)g, saturated fat 14.5(5.8)g, protein 31.2(6.5)g, carbohydrate 104.2(16.6)g. Analysis by ANOVA showed that the catered hall meal-options, presented significantly more calories than the menus in all the five chain restaurants ($p=0.0015$).

Conclusions: Meals provided in the independent restaurant serving young adults contained was higher in calories and saturated fat than chain restaurants and both exceeded the 30% of energy requirements. Regulating or setting nutritional standards for meals at all places that provide food could help to avoid unwanted weight gain and diet-related diseases.

P3b.24

Evaluating the diets and school environments of secondary school pupils in rural Sri Lanka

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose:

Schools are recognized as effective and efficient settings through which to prevent malnutrition, but further work is needed to understand the mechanisms and best approaches to nutrition promotion in schools, particularly in low and middle income countries. Traditionally, schools have followed a didactic approach to health promotion, focussing on curricula which teach students about healthy eating. However, school policies, practices and environmental characteristics may also have an influence on pupil dietary choice. This project measures school environments and student health behaviours in three rural districts of Sri Lanka, a country experiencing an epidemiological transition.

Methods:

Data was collected in August 2014 from a random selection of secondary pupils aged 12-18 years ($n=1500$) and principals ($n=50$) from 50 schools in three rural districts of Sri Lanka. Student health outcomes were measured using the World Health Organization's Global School-Based Health Survey and food frequency questionnaires, completed by students in the classroom setting. Features of the school environment were identified via semi-structured interviews with school principals using a tool developed from the World Health Organization's Nutrition Friendly Schools Initiative, a framework that outlines actions that schools should take to promote healthy eating and nutrition.

Results:

Multi-level analysis showed significant variation between schools in pupil dietary choice. This included a range in the percentage of pupils in school drinking soda from 8% to 74%, with an overall percentage of 29% reporting to drink soda regularly. Furthermore, 11% reported never eating fast food, with the percentages in schools ranging from 0 to 57%. While most of the schools offered classes on the benefits of healthy eating, there was variation between schools in the availability of food (e.g. provision of school meals), school facilities (e.g. toilets) and within-school messaging towards nutrition (e.g. advertising of food and beverages in school grounds).

Conclusions and Implications:

Schools play an important role in nutrition promotion in rural and impoverished areas of Sri Lanka. An improved understanding of their role will contribute to better health promotion interventions in Sri Lanka and other low and middle income countries.

P3b.26

Associations between structure-related and non-responsive feeding practices and eating behaviours of children aged 1-10 years

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose: Providing a structured mealtime environment and using responsive feeding practices are proposed to promote healthy eating patterns and help children retain their innate ability to self-regulate energy intake[1]. The aim of this study was to identify associations between structure-related and non-responsive feeding practice and children's eating behaviours, and examine how these associations relate to child age.

Methods: Parents (n=407) of 1-10 year old children completed an online questionnaire including the Feeding Practice and Structure Questionnaire (FPSQ)[2] and the Children's Eating Behaviour Questionnaire[3]. The following FPSQ subscales were used in analysis: Family Meal Setting, Structured Meal Setting, Structured Meal Timing and Non-responsive Feeding Practices, combining Distrust in Appetite, Reward for Behaviour, Reward for Eating, and Persuasive Feeding. Associations between parental feeding practices (independent variables) and children's eating behaviours (dependent variables) were tested using multiple linear regression models, adjusting for parent age, education level, child age and gender.

Results/findings: Parental use of Family Meal Setting, Structured Meal Setting and Non-Responsive Feeding Practices increased with child age. Family Meal Setting was negatively associated ($\beta = -.290$, $p < .001$), and Non-Responsive Feeding Practices were positively associated ($\beta = .349$, $p < .001$) with Fussiness. Family Meal Setting ($\beta = .275$, $p < .001$), Structured Meal Setting ($\beta = .112$, $p = .025$) and Structured Meal Timing ($\beta = .112$, $p = .020$) were positively associated, and Non-Responsive Feeding Practices ($\beta = -.211$, $p < .001$) were negatively associated with Enjoyment of Food. Non-Responsive Feeding Practices were positively associated with all other children's eating behaviours. When examined for age differences, the association between Structured Meal Setting and Enjoyment of Food was significant only for younger children ($\beta = .201$, $p = .003$), Non-Responsive Feeding Practices and Satiety Responsiveness ($\beta = .163$, $p = .026$) and Slowness in Eating ($\beta = .215$, $p = .003$) were significant only for older children and Structured Meal Timing was negatively associated with Emotional Undereating ($\beta = -.248$, $p = .002$).

Conclusions: Providing parents with guidance to provide a structured mealtime environment and recognise and respond to their child's hunger and satiety cues may help promote healthy eating behaviours in their children. Longitudinal research to determine the direction of these associations is warranted.

References:

- [1] Eneli. *Obesity*. 2008;16(10):2197-204.
- [2] Jansen. *Int J Behav Nutr Phys Act*. 2014;11:72.
- [3] Wardle. *Child Psychol Psychiatry*. 2001;42(7):963-70.

P3b.28

Systematic Review on the determinants of Fruit and Vegetable consumption in young children (aged 0-6)

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Purpose: A diet rich in fruit and vegetables (F&V) is known to reduce the risk of obesity and obesity-related diseases¹. Identifying determinants, including barriers and facilitators, of F&V consumption, is an important step when designing effective and sustainable interventions to prevent obesity in young children.

Methods: A systematic review of both quantitative and qualitative evidence was carried out to identify determinants of F&V consumption in young children. Eight electronic databases were searched in June 2012. Prospective and intervention studies investigating change in fruit and vegetable consumption in children and qualitative studies exploring barrier or facilitators to F&V consumption were included. Studies in clinical populations and laboratory-based studies were excluded. Data was extracted, quality assessed and synthesised. Quantitative data was summarised using either forest of harvest plots and supported by narrative synthesis. Qualitative data was analysed using thematic synthesis.

Results: 49 papers provided evidence for this review (intervention n=29, prospective cohort n=7, and qualitative n=13). Evidence from intervention studies showed that increased parental knowledge, education, higher socioeconomic status, and children's liking/preference for specific F&V, were all positively associated with an increase in F&V consumption. Intervention studies (n=2) relating to policy change in nursery school showed no improvements in F&V consumption.

Evidence from prospective cohort studies demonstrated that maternal feeding practices, particularly modelling of healthful dietary behaviours, were positively associated with a higher F&V consumption in young children. In contrast, parental pressure to eat healthy foods, or restricting the consumption of unhealthy foods was found to have a detrimental effect, presenting a decrease in child F&V consumption.

In the qualitative studies commonly identified barriers and facilitators to F&V consumption including; accessibility, costs of food, temperament behaviours of the child, lack of transport, convenience of unhealthy food and time constraints.

Conclusions: The available evidence suggests that maternal feeding practices, in particular modelling of healthful dietary behaviours, appear important determinants of F&V consumption in young children. These, along with barriers and facilitators identified in the qualitative studies may be considered important targets of consideration, particularly for interventions which aim to tackle obesity in young children.

¹Christian et al, 2013. *J Epid Comm Health*; 67:332-338.

P3b.29

Environmental and peer influences on adolescents' dietary habits

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Environmental influences outside of the home are thought to have an impact on adolescents' eating habits. The objective of this paper was to determine the influence that peers and eating outside of the home have on the diet quality of overweight/obese teens who presented for obesity treatment.

Methods: 176 overweight/obese teens (11-17 yrs) and one parent completed a baseline visit for enrollment into a 34-week E-Health program designed to improve behavioural (physical activity, dietary habits, and sedentary behaviors) and weight outcomes. At the baseline visit, participants completed questionnaires about their dietary habits over the past week and three web-based 24-hour dietary recalls. Dietary quality was assessed by the Healthy Eating Index (HEI), a score out of 100 that was calculated based on Canadian Food Guideline recommendations. A higher score indicated a more healthful diet. A generalized linear model, with relevant covariates, was used to determine whether HEI scores were associated with peer modeling, eating out with friends, purchasing snacks from vending machines, and eating meals away from home.

Results: Among adolescent participants, 56% were female, the mean age was 13, the mean Body Mass Index was 31 (mean z-score=2.7), and the mean HEI score was 63.9. Univariate analyses suggest that eating more meals away from home ($\beta=-0.26$, $p=0.003$) and purchasing at least one snack from vending machines per week ($\beta=-0.20$, $p=0.01$) are significantly associated with a lower HEI score among teens. In addition, purchasing meals or snacks with friends outside of school was also associated with a lower HEI score ($\beta=-0.17$, $p=0.03$). Finally, older teens were more likely to have a lower HEI score ($\beta=-0.23$, $p=0.002$). In the multivariable model, only purchasing meals away from home remained a significant predictor of an adolescent's HEI score ($\beta=-0.26$, $p=0.01$).

Conclusions: The results demonstrate the importance of influences beyond the home on adolescents' dietary quality. Peer influences and meals eaten outside of the home should be targeted to promote healthier diets in adolescent obesity treatment programs.

P3b.31

Influence of Health Claims on Appetite Sensations according to Sex, Weight Status and Restrained Eating

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Health claims may help people to adopt healthier eating habits, but little is known about the potential cognitive effects of such claims on appetite sensations. The main purpose of this study was to investigate the effects of healthy, satiating and hedonic claims on appetite sensations, and to evaluate if these effects are modulated by sex, weight status and restrained eating.

Methods: According to a three (healthy vs satiating vs hedonic) by two (restrained or not restrained) by two (normal-weight or overweight/obese) factorial design, 164 males and 188 females aged 18-65 were invited to taste and rate oatmeal-raisin cookies in a blinded and ad libitum context. Visual analog scales (mm) were used to evaluate desire to eat, hunger, fullness and prospective food consumption before and over a 1h post-consumption period. BMI and Restraint Scale were used to categorize participants according to their weight and restraint status. MIXED procedures for repeated measures were performed to assess differences between experimental conditions. Bonferroni corrections were made for multiple comparisons.

Results: No main condition effect was observed for any of the four appetite sensations. However, subgroups analysis revealed a greater decrease among normal-weight unrestrained women in desire to eat, hunger and prospective food consumption in the satiating condition (31.4 ± 26.9 mm, 24.2 ± 22.1 mm, 35.2 ± 23.5 mm) compared to the healthy condition (53.1 ± 36.6 mm, 52.2 ± 36.3 mm, 54.7 ± 35.3 mm; $ps < 0.0215$). Among overweight unrestrained men, the satiating condition rather increased satiety (96.9 ± 33.3 mm) more importantly than the healthy and hedonic conditions (64.0 ± 33.6 mm and 68.8 ± 28.8 mm; $ps < 0.0476$). A main effect of sex was also observed for all appetite sensations with men reporting higher levels of desire to eat (51.5 ± 33.8 mm), hunger (49.0 ± 34.0 mm) and prospective food consumption (61.3 ± 33.4 mm) and lower levels of satiety (76.4 ± 35.2 mm) than women (43.8 ± 35.4 mm, 39.7 ± 34.4 mm, 46.0 ± 33.3 mm, 83.6 ± 38.2 mm; $ps < 0.0076$), independently of experimental conditions and estimated energy needs.

Conclusions: While satiety claims could be seen as a public health strategy to enhance satiety among overweight people, the present results suggest that this effect could be observed only among unrestrained men. These findings highlight the importance of considering individual characteristics such as sex when assessing the impact of health claims on appetite sensations.

P3b.33

Individualized nutrition interventions in youth with first episode psychosis: a novel strategy for the prevention of diabetes and cardiovascular disease.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective:

Youth with psychosis commencing antipsychotic medication experience rapid weight gain, and significantly increased risk for cardiovascular disease and diabetes, the most significant driver of the 20-year mortality gap. Over 75% of youth experiencing a first-episode of psychosis (FEP) gain clinically significant weight (mean 12kgs) in the first 2-years following treatment initiation, however physical health interventions in this population are scarce. Common traits of FEP youth include insatiable hunger, cravings for sweet foods and drinks, low levels of physical activity and low levels of motivation. In addition, people with psychotic illness consume diets higher in calories, saturated fat, and sweet foods and drinks, and lower in fruit, vegetables and milk. This is first study to assess the impact of individualised dietetic intervention on nutritional intake in FEP to reduce the risk of clinically significant weight gain and subsequent cardiometabolic complications.

Methods:

A 12-week prospective, pragmatic evaluation of an individualised lifestyle intervention was conducted at a specialist community-based early psychosis treatment programme. The Keeping the Body In Mind (KBIM) lifestyle intervention was delivered by specialist clinicians (nurse, dietitian and exercise physiologist) to youth experiencing FEP within one-month of commencing antipsychotics. The dietitian offered weekly individual consultations, and a weekly group session (shopping tour and cooking group). Changes in energy intake, sodium intake, discretionary food intake, glycaemic load and diet quality were evaluated. Clients completed the Dietary Questionnaire for Epidemiological Studies in a pre-post design that evaluated energy intake, sodium intake, discretionary foods and glycaemic load. Diet quality was calculated using the Australian Recommended Food Score.

Results:

The KBIM intervention (n=18) resulted in significant reductions in energy intake [-454kcal (458), t(17) = -4.2, p = <0.001], sodium intake [-713mg (703), t(17) = -4.3, p = <0.001], glycaemic load [-33 (28), t(17) = -5.0, p = <0.001] and discretionary food intake [-94g (92), t(17) = -4.3, p = <0.001], whilst improving diet quality [3.6 (6.7), t(17) = 2.3, p = 0.04].

Conclusion:

The integration of a specialist dietitian into youth FEP programs can improve nutritional intake, reducing the risk for weight gain and cardiometabolic complications at the commencement of antipsychotics.

P3b.34

What is the effect of a behaviour change intervention on the diets of women attending Sure Start Children's Centres in Southampton?

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SIG: Yes, Policies and environments

Awards: No

Background: A major component of the UK government response to the obesity epidemic is for action in communities to improve people's health behaviour. Women of lower educational attainment have diets of poorer quality than women with higher levels of attainment. Exploration of the barriers to healthier behaviours within this group has shown that these women feel they lack control over the food choices they make for themselves and their families, and have lower self-efficacy for healthy eating.

Objective: To evaluate the effects of a community-based behaviour change intervention on the diets of women from disadvantaged backgrounds attending UK Sure Start Children's Centres (SSCC).

Methods: Participants were 527 women attending SSCCs in Southampton (intervention) and 495 women attending Centres in Gosport and Havant (control). The intervention consisted of training for SSCC staff in behaviour change skills that would enable them to empower women to improve their health behaviours. The primary outcome was dietary quality. Self-efficacy and sense of control were intermediate outcomes. All outcomes were assessed before, and one year after, the intervention.

Results: One year after training, staff in the intervention area were using skills to support behaviour change significantly more than in the control area (p<0.001). In both the intervention and control groups, between baseline and follow up, there were significant reductions of 0.1 SD in women's dietary quality, and reductions in their levels of self-efficacy and sense of control. There were no significant differences between the intervention and control groups in the magnitude of the change in dietary quality. However, the decline in self-efficacy and control was significantly smaller in the intervention women than in the women from the control areas.

Conclusion: The intervention led to sustained increase in skills to support behaviour change among SSCC staff, but did not result in improvements in women's diets. However, it had a protective effect on women's self-efficacy and sense of control. This suggests that more prolonged exposure to the intervention may improve diet and, given the challenges of evaluation in a community setting, that further evaluation in a more controlled setting is needed.

P3b.35

Girls' higher vegetable preferences can be tracked to their previous vegetable intake and psychosocial factors

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SIG: Yes, Children and families

Awards: Yes, for the Student Competition

Purpose:

Taste preferences strongly determine vegetable intake among school-children and, moreover, are found to explain the higher vegetable intake among girls. The aim was to examine whether the same determinants increase vegetable preferences similarly among both genders and which factors can explain the higher vegetable preferences among girls.

Methods:

In the PRO GREENS project 424 Finnish 11-year-old children participated both at baseline in 2009 and in the follow-up 2010 (response rate 83%). In both study years children filled in a validated questionnaire about their vegetable preferences as well as environmental and psychosocial factors: modelling vegetable intake of mother, father and friends, parental verbal encouragement and demand to eat vegetables, eating vegetables together with the family, home vegetable availability, perceived barriers to eat vegetable and knowledge of healthy diet. Children's vegetable intake (times/day) was assessed with a validated food frequency questionnaire. Associations were examined with linear regression analyses and mediation analyses with Mplus.

Findings:

Vegetable preferences were predicted equally among girls and boys by higher levels of modeling vegetable intake of father ($\beta=0.13$, CI95% 0.02-0.24), parental encouragement ($\beta=0.12$, CI95% 0.03-0.20) and demand ($\beta=0.19$, CI95% 0.12-0.26), eating vegetables with the family ($\beta=0.33$, CI95% 0.23-0.44), availability ($\beta=0.24$, CI95% 0.15-0.33), knowledge ($\beta=0.19$, CI95% 0.10-0.28) and previous vegetable intake ($\beta=0.34$, CI95% 0.25-0.42) as well as lower level of barriers ($\beta=-0.26$, CI95% -0.39--0.16). Girl's higher preferences were explained by higher parental demand to eat vegetables ($\beta=0.02$, CI95% 0.00-0.04), absence of barriers ($\beta=0.05$, CI95% 0.03-0.07) and higher previous vegetable intake ($\beta=0.08$, CI95% 0.04-0.12).

Discussion:

To increase boys' low vegetable preferences, and through that also their low vegetable intake, attention has to be paid mainly on diminishing the barriers to eat vegetables and on supporting vegetable intake to become a habit. It can be beneficial to encourage parents of boys to set gentle but firm rules concerning tasting and eating vegetables.

P3b.37

Adopting Healthy Habits: Nutrition educators collaborate to change nutrition and activity environments by expanding roles to include policy, systems, and environmental change

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SIG: Yes, Policies and environments

Awards: No

Purpose: Using a formative, community-based participatory approach, we identified programmatic supports necessary for nutrition educators, both professional and paraprofessional, to extend their impact by expanding their roles beyond direct education of individuals to include development of and engagement in policy, systems, and environmental (PSE) changes that help make healthy choices easier in the environments where children and adults live, learn, work, and play.

Methods: Over 5 years, Adopting Healthy Habits (AHH), a state-wide learning collaborative, provided partial funding for existing nutrition educators in 7 diverse New York county Cooperative Extension associations. The 16 staff participating in AHH translated statewide strategies involving staff development, worksite wellness, changes in partner organizations, and engagement in local coalitions, into local, site-based activities driven by local needs and opportunities. Process and output data were collected from yearly work plans, periodic focus groups and interviews with staff and partners, community readiness and other needs assessments, minutes of coalition meetings, and monthly documentation of project activities. These data were analyzed to identify site-specific successes and challenges and programmatic supports and resources required for adoption of expanded staff roles. Further analyses identified emergent themes across overall AHH initiative.

Results/Findings: With guidance, dedicated time, and supported skill development, nutrition educators can expand their role from provision of direct education to agents of PSE efforts in multiple community environments. Results led to documentation of best practices for work with partners in primary sectors, i.e. schools, community based organizations, and coalitions. Variation between localities led to site-specific case studies that may serve as roadmaps for others beginning PSE efforts. Specific successes and challenges elucidated additional needs regarding effective broad-scale evaluation tools, resources to support dedicated time for PSEs, and staff training relevant to multiple community roles undertaken by both professional and paraprofessional staff.

Conclusions: As current state and federal policy shifts provide opportunities for public health nutrition staff to implement PSEs through multiple funding streams, lessons learned from AHH pinpoint opportunities within current partnerships, methods and tools for transitioning into these efforts, and additional research needs related to development of sensitive and effective evaluation tools.

P3b.81

The Family Life, Activity, Sun, Health and Eating Study: A novel opportunity to evaluate multilevel influences on obesogenic behaviors among parent-teen dyads

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: To provide an overview of the FLASHE study, a forthcoming public-use resource that evaluates multilevel influences on multiple health behaviors (diet, physical activity, sedentary behavior, sleep, sun safety, tobacco use).

Methods: FLASHE is a U.S.-based sample of parents and teens drawn from a Consumer Opinion Panel. Cross-sectional data were collected between April-October, 2014 using a web-based platform. FLASHE focuses on multilevel correlates of health behaviors among parent-teen dyads (12-17 years old) with an oversampling of Non-Hispanic Blacks. Objective physical activity was measured in a subsample of teens. Constructs include psychosocial factors (e.g. self-efficacy, motivation, emotional regulation), interpersonal factors (e.g. parenting style and parenting practices), and characteristics of the home and neighborhood environments among others (e.g. food insecurity, housing, employment). Data collected allow for individual- and dyadic-level analyses.

Results: The FLASHE study enrolled 1944 parent-teen dyads, of which 1251 were randomized to receive only the FLASHE surveys and 693 to receive the FLASHE surveys plus a physical activity monitor to be worn by teens for 7 days. For parent participants, 17.8% were Non-Hispanic Black, 24.8% were fathers, 58.5% were employed for wages, and 23.6% of the sample reported income <\$35,000USD. In the teen sample, 49.6% were boys. Initial findings demonstrate several opportunities for testing relationships across multiple levels of influence. For example, availability of fruits and vegetables (FV) in the home was associated with controlled ($r_s \geq .09$) and autonomous motivation ($r_s \geq .26$), as well as self-efficacy for eating fruits and vegetables ($r_s \geq .27$) in teens and parents ($p_s < .001$). Similarly, availability of activity equipment in the home and activity facilities in the neighborhood, were associated with self-efficacy ($r_s \geq .13$) and motivation ($r_s \geq .09$) for being physically active among teens ($p_s < .001$).

Conclusions: FLASHE is a unique, public-use resource to evaluate research questions focused on parents, teens, and parent-teen dyads across levels of influence on multiple health behaviors. Future directions for FLASHE include a geospatial initiative, calibration of the physical activity self-report instrument to assess minutes of moderate-vigorous physical activity, and the integration of FLASHE survey data with extant data resources (e.g. school policy data).

P3b.82

Family concerns: Reducing lifestyle associated cancer risk in people attending NHS Genetic Service Family History clinics

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SIG: Yes, Cancer Prevention and Management

Awards: No

Objective: For people who are at greater risk of cancer due to a family history of the disease (which may reflect shared genetic and behavioral profiles) it is important to follow recommendations for screening and lifestyle. The current work aimed to assess health behaviours and perceived control of breast/colorectal cancer amongst attendees of family history clinics (FHC).

Methods: Participants attending the East of Scotland Genetics Service FHC's were mailed a study invitation and invited to complete a questionnaire (demographic data, weight and height, health behaviours and psycho-social measures of perceived control) and to participate in an in-depth interview.

Results: The questionnaire was completed by 237 (49%) of attendees, ranging from 18 to 77 years (mean age 46 (+10) years) of which 88% were female.

Most (54%) had a BMI >25kg/m², and 23% had a BMI >30 kg/m², 39% did not meet physical activity targets, 50% ate <5 portions fruit and vegetables per day and 64% had low fibre intakes. Reported smoking rates were low (11%) whilst 30% of women and 25% of men reported consuming more alcohol than recommended. Participants believed their risk of developing cancer is high but also perceived that they have some control over their health. In-depth interviews from 20 attendees (95% female, age range 32 to 71 years) reported that:

- Recall of having been offered lifestyle advice varied, with many seeing any advice as an incidental part of the conversation with staff.
- There were some doubts expressed as to the link between lifestyle and cancer and when prompted few were familiar with the current evidence.
- There was little appetite for general (non-tailored) lifestyle advice

Conclusions: Despite increased cancer risk, reported health behaviours were inconsistent with current recommendations for cancer risk reduction. The findings on perceived risk are consistent with people who recognise the importance of personal action to reduce risk such as seeking guidance from health professionals (hence clinic attendance). Intervention design needs to take account of illness beliefs related to disease control and prevention and be personalised to specific disease risk factors. Family support for behaviour change remains to be explored.

P3b.83

Overweight in homeless children and associated socio-demographic and socioeconomic covariates: the French ENFAMS study.

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SIG: Yes, Socioeconomic inequalities

Awards: No

Purpose: Health outcomes and their social determinants have been understudied amongst excluded, hard-to-reach populations in France. We aimed to describe overweight and obesity prevalence in homeless children, along with the associated socio-demographic and socioeconomic factors.

Method: This analysis included 478 children aged 2-13 y from the ENFAMS cross-sectional study, which was performed in 2013 among a random, representative sample of families sheltered in emergency centres for asylum-seekers, emergency housing centres, social reinsertion centres and social hotels in the Paris metropolitan area. Data were collected during face-to-face interviews conducted in 17 languages. Measurements included anthropometrics were performed by a nurse. Chi square analysis was undertaken to assess the associations between child overweight (including obesity) and maternal factors (education level, geographical origin, French proficiency, marital status, BMI category and depression), as well as household factors (housing centre type, health insurance, income, homeless duration, food insecurity).

Results: Overall 25.6% (95%CI 19.5-31.7) of homeless children living in the Parisian area were overweighted, including 4.0% (95%CI 1.7-6.3) obese. While no significant relationship was observed with gender, 6-13 y-o children were more likely to be overweighted than their younger counterparts (34.8% vs. 18.0% in children aged 2-5 y, $p=0.002$). Overweighted children were more likely to be born to mothers with the lowest education level (i.e. no diploma) (33.0% vs. 13.4% in children of mothers with a university degree, $p=0.05$) and experiencing depression (36.3% vs. 21.8% in the absence of maternal depression, $p=0.02$). Overweight prevalence in children was positively associated with homeless duration: 14.8% when <14 months vs. 30.3% when >35 months ($p=0.04$). No other significant relationship was observed with the covariates studied.

Conclusion: Child overweight is a major concern in homeless families, with rates overall 10 points higher than in the general paediatric population. While further multivariable analyses will allow us to assess the independent associations with each of the social covariates addressed, these preliminary descriptive findings suggest the deleterious influence of homeless living conditions on child overweight and provides important insights for the implementation of socially targeted obesity prevention interventions.

P3b.84

Patterns of Use and Pregnancy Weight Gain Outcomes for An Online Intervention Designed for a Diverse Population

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SIG: Yes, e- & mHealth

Awards: No

Objective: To describe the use of an integrated mobile phone and online healthy lifestyle intervention by pregnant women and relate tool use to pregnancy weight gain outcomes. The study builds on patterns of use identified in a previously published paper, *J Med Internet Res* 2014; 16(8):e194.

Methods: Development of the intervention was guided by the Integrative Model of Behavior Prediction and Fogg's Behavior Model for Persuasive Design. Effectiveness was tested in a 3-arm randomized controlled trial with pregnant women with normal, overweight, and obese class 1 body mass indices (BMI) and low and higher household incomes. Anthropometric and medical data were collected through a medical record audit. Use of intervention features was automatically logged by the project website. A subsample of 1,331 randomized, eligible, and participating women from the original 1,689 randomized are analyzed for this presentation.

Results: Among normal and overweight BMI women, low income women were more likely to be non-users than higher income women ($p<0.01$). Among obese women, there were no differences in use by income. Super and medium users used all intervention tools, including diet and physical activity goal setting, health information, resources and blogging and they consistently used the weight gain tracker. The weight tracking women consistently used this feature and rarely used other tools. Among normal BMI women in both income groups, a significantly greater proportion ($p=0.05$) were in the weight tracker group compared to the super or medium user group. Few significant associations were found between increasingly consistent use of intervention tools and weight outcomes. A noted exception was in obese women where being a super or medium user was significantly associated ($p<0.05$) with increased risk of excessive weight gain compared to being a weight gain tracker.

Conclusions: Use of intervention tools was associated with income in normal and overweight BMI women, but not in obese women. Only normal BMI women were more likely to be weight trackers than super or medium users. Use of intervention tools was significantly related to weight outcomes only among obese pregnant women where greater use was associated with increased risk of excessive pregnancy weight gain.

P3b.85

The 'Be Positive Be Healthe' eHealth weight loss program for young women: A pilot study

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SIG: Yes, e- & mHealth

Awards: Yes, for the Early Career Award

Purpose: Weight gain is a major health problem for young women. However, traditional weight loss programs do not appeal to them. This study aimed to evaluate feasibility, and preliminary efficacy of 'Be Positive Be Healthe', a weight loss intervention for young (aged 18 to 30 years) women delivered using eHealth technologies.

Methods: A single arm pre-post test study in 18 women (Mean: Age 22.8±3.2 years, BMI 27.3±1.6kg/m²) was conducted from September to December 2013 in the Hunter region of New South Wales, Australia. 'Be Positive Be Healthe' aimed to achieve modest weight loss (5 to 10% reduction) over 3-months by supporting participants to make changes to key eating and physical activity behaviors associated with weight gain among young women (i.e. promoting fruit and vegetable intake; boosting moderate to vigorous physical activity; decreasing energy-dense, nutrient-poor food intake, including alcohol and fast-foods; and reducing the amount of sitting time). 'Be Positive Be Healthe' was delivered using a variety of eHealth technologies, (website, online quizzes with individualized email feedback, an online discussion forum, smartphone application, email newsletters and text messages). Women were assessed at baseline and 3-months for weight, BMI, waist circumference and fat mass. Participants completed a process evaluation survey to evaluate the acceptability of the intervention after 3-months.

Results: Retention was 66.7% post-program. A significant reduction in mean ± SD weight (-1.5±2.4kg or -2.0%, p=0.02), BMI (-0.5±0.9kg/m², p=0.02) and waist circumference (-0.7±1.4cm, p=0.04) from baseline to 3-months was observed in the intention-to-treat population (n=18). There was a trend for a reduction in fat mass (-2.9 ±4.6kg, p=0.07 or -3.3±5.7%, p=0.08) for completers only (n=12). Participants overall satisfaction with the program was moderate (Mean satisfaction: 3.4±1.0 [max 5]). The email newsletters and online quiz with feedback were the most acceptable, and the online discussion forum the least acceptable program components.

Conclusion: 'Be Positive Be Healthe' participants achieved statistically significant improvements in key weight-related outcomes at post-intervention. Therefore, confirmation of efficacy in a randomized control trial is warranted. Further consideration of new and innovative strategies to engage and retain young women in weight loss interventions is still required.

P3b.86

HomeStyles: Development and Formative Evaluation of an Obesity Prevention Intervention for Families with Preschool Children

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SIG: Yes, Policies and environments

Awards: Yes, for the Student Competition

Purpose: Health behavior change programs personalized to the wants and needs of their audiences have an increased likelihood of success. The purpose of this study is to develop and formative test HomeStyles, an obesity prevention program designed to motivate and enable parents of preschoolers to reshape home environments and lifestyle practices to reduce obesity risk.

Methods: Development began by identifying key factors in the home environment affecting childhood obesity. Focus groups with 138 parents in 2 geographic locations investigated parents' weight-related cognitions, behaviors, barriers to performing healthier behaviors, and strategies for overcoming barriers. Focus groups also verified which intervention topics, structure, materials, and approach were most desired and in what format. Next, instructional guides were developed by experts in nutrition education/communication, behavior change, obesity prevention, child development/psychology, parenting, exercise, community-based participatory research, instructional design, motivational interviewing, and cultural competence. Drafted materials were cognitively tested with 209 parents via interviews to determine overall impressions, helpfulness, usefulness, and acceptability. Guides were then refined, reviewed by experts, and graphically designed. The near final draft underwent additional cognitive testing with 201 parents to ensure the content and appearance resonated with parents. The guides were finalized, proofread, and published. These same steps were followed to create the materials in Spanish.

Results/Findings: This process resulted in 12 brief (~15 minutes each), interactive mini-magazine "guides" suitable for delivery via home visitation sessions or self-guided online learning. Each guide focuses on realistic strategies parents can use to shape one aspect of the home environment and lifestyle (e.g., family meals, active play, adequate sleep). Most guides are accompanied with materials for facilitating the changes the guide promotes (e.g., measuring cups to support serving age-appropriate portions). Motivational interviewing techniques are incorporated to facilitate parents' own ideas and motivation. Formative testing results indicate parents find the materials helpful, fun, interesting, and useful.

Conclusion: Investing in formative evaluation that characterizes the target audience's needs, interests, and preferences as well as establishing the usability and acceptability of materials is critical to creating materials that resonate with the audience. Funding: USDA NIFA #2011-68001-30170.

P3b.88

Parenting Intervention Reduces Use of Feeding To Soothe Infant Distress (Project INSIGHT)

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SIG: Yes, Children and families

Awards: No

Purpose: The Intervention Nurses Start Infants Growing on Healthy Trajectories (INSIGHT) Study is an ongoing, longitudinal, randomized, controlled trial designed to promote responsive parenting for the primary prevention of pediatric obesity. Infant crying tends to elicit greater use of food to soothe infant distress leading to overfeeding, thereby influencing obesity risk. We examined the effect of the parenting intervention on maternal use of food to soothe infant distress.

Methods: Primiparous mother-newborn dyads were recruited after delivery from one maternity ward and randomly assigned to the parenting or safety group (n=291) with the interventions beginning 3 weeks after birth. Ecological Momentary Assessment was utilized to assess infant crying behavior and mother response to infant crying following the first home intervention visit in a subset of participants (n=153). An event-sampling protocol was used; every 4 hours, for 8 days, participating mothers were prompted to enter the number of times their infant fussed, what techniques they used to soothe the infant, and what worked to soothe their infant at infant age 3 and 8 weeks. Repeated measures ANOVA was used to assess the effect of the intervention on the use of food to soothe. Breastfeeding, number of night wakings, intensity of infant fussing, and maternal depression were investigated as potential covariates.

Results: Following the infant age 3 week visit, mothers in the parenting group reported feeding as a first response to soothe their infant less often than mothers in the safety group (26.4 vs 39.8%, $p=0.0006$). Compared with safety mothers, parenting mothers reported using alternatives to feeding in response to crying (e.g., swaddle, rub/pat, bounce/rock/walk/swing, give pacifier, shush/white noise) more often (51.0 vs 33.4% of soothed fusses, $p<0.0001$) as well as a greater rate of successfully soothing their infant with these techniques (49.4 vs 35.8%, $p=0.0002$). At infant age 8 weeks, feeding to soothe was not significantly different between the two groups, but mothers in the parenting intervention still reported trying alternative soothing techniques first more often than safety group mothers (47.2 vs 37.9%, $p=0.03$).

Conclusions: A responsive parenting intervention is protective against using food to soothe a first response to infant distress.

P3b.89

Relationships between binge eating behaviors, coping strategies, gender, body image satisfaction in a population of adolescents from Saguenay

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Knowing that overweight and obesity are a major problem in modern societies and that binge eating behaviors are often related to overweight and obesity, this study aims to explore the relationships between binge eating behaviors (BE), coping strategies (CS), gender, body image satisfaction (BIS) in a population of adolescents from Saguenay. Few researches have studied the variables associated with binge eating behaviors and even fewer within the adolescent age group.

Methods:

Participants : 426 adolescents (181 ♂ and 245 ♀, average age = 15.7), secondary school students in their 3rd, 4th, and 5th year in a Saguenay high school (Quebec, Canada). The data were collected using: *Binge Eating Scale* (Gormally, Black, Daston & Rardin, 1982), *Self-report coping style* (SRCS; Causey & Dubow, 1992) et *Emotional Approach Coping Scale* (Stanton et al., 1994), *Contour Drawing Rating Scale style* (Thompson & Gray, 1995). Data analysis used Anova, t test and Pearson correlation coefficients.

Results:

This research provides evidence that many participants do adopt BE. Binge eating scores were: 1) higher for girls ($t = -6.995$; $p < 0.001$); 2) not related to participants' use of approach coping strategies, 3) but related to greater use of avoidance coping strategies ($r = 0.35$; $p < 0.001$). BE was not related to emotional approach coping. In general, adolescent girls used more coping strategies than adolescent boys; this was the case for approach coping, avoidance coping, and emotional approach coping. BE were also related to body image dissatisfaction ($t = -7.359$; $p < 0.001$), for both gender, even though the scores of adolescent girls were significantly higher. Girls were twice as many reporting body image dissatisfaction as boys. These results did also raise questions in terms of assessment of binge eating behaviors in the adolescent population.

Conclusions:

The results confirm that BEB is related to CS, gender, and BIS. Implications raise questions on the best criteria to use for assessing BE in the adolescent population. Implications are in favor of offering specific interventions to girls in relation to BE. Future research should use longitudinal models and be conducted in more schools and regions.

P3b.90

Efficacy of the *Active Early* intervention to increase physical activity and related behaviors in early care and education settings in US underserved communities

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SIG: Yes, Early care and education

Awards: Yes, for the Early Career Award

Objective: Physical activity has been identified as a critical component of obesity prevention, but interventions targeting the vulnerable period of early childhood (2-5 years) are lacking. The *Active Early* curriculum was designed to increase physical activity in early care and education (ECE) settings. A previous study indicated significant benefits of *Active Early* among higher-resource ECE sites; the purpose of this quasi-experimental study was to measure the efficacy of *Active Early* to increase physical activity and related behaviors in ECE settings serving a high proportion of children from underserved groups (including Hmong, American Indian, Latino, African American, and low-income children).

Methods: Fifteen ECE settings (8 group and 7 family providers, ~500 children) received the *Active Early* curriculum, including training, technical assistance, micro-grants, and family engagement strategies over two years. The nutrition and activity environment and related behaviors were assessed before, during, and after the intervention using the Environment and Policy Observation Assessment (EPAO) tool and other surveys, and exit interviews were conducted with providers and technical consultants to assess implementation and acceptance.

Results: The percentage of centers with a written physical activity policy increased post-intervention (60 vs. 86%); all policies included a minimum of 60 minutes planned outdoor time. The mean observed outdoor playtime varied widely, resulting in a non-significant increase (37.1±32.1 minutes at baseline vs. 51.6±44 minutes post-intervention, $p>0.05$); a trend for greater improvement among family centers was observed (23.9±25.4 vs. 51.8±52.8 minutes, $p=0.09$ for interaction). The total physical activity environment score was unchanged; interestingly, the total nutrition score (10.7±1.7 vs. 13.0±2.0 on 20-point scale, $p<0.01$) and multiple subscores (beverages, whole grains, nutrition-focused education) significantly improved post-intervention. Qualitative data identified staff and child turnover, lack of parent engagement, and seasonal issues as significant barriers to implementation and data collection. Micro-grants were reported to assist with overcoming some barriers (e.g., providing equipment and appropriate clothing for seasonal activity).

Conclusion: Moderate policy and environmental improvements in physical activity and related behaviors can be achieved with *Active Early* in underserved ECE settings, but more work is needed to understand and address the significant barriers and to support sustained changes in lower-resource centers.

P3b.91

Good practice characteristics of diet and physical activity interventions and policies: An umbrella review

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SIG: ,No, this communication does not fit in any of the SIGs

Awards: No

Background: This umbrella review aimed at eliciting good practice characteristics (GPCs) of interventions and policies aiming at healthy diet, increasing physical activity, and lowering sedentary behaviors. Applying the World Health Organization's framework, we sought for three types of GPC, reflecting (1) main intervention/policy characteristics, referring to design, targets, and participants, (2) monitoring and evaluation processes, and (3) implementation issues. This investigation was undertaken by the DEDPIAC Knowledge Hub (the Knowledge Hub on the DEterminants of Diet and Physical Activity), a joint programming initiative of European Union.

Methods: A systematic review of reviews and stakeholder documents was conducted. Data from seven databases was analyzed (99 documents met inclusion criteria). Additionally, resources of seven major stakeholders (e.g., World Health Organization) were systematically searched (10 documents met inclusion criteria). Overall, the review yielded 74 systematic reviews, 16 position review papers, and 19 stakeholders' documents. Across GPCs, 25% were supported by ≥ 4 systematic reviews. Further, 25% GPCs were supported by ≥ 3 stakeholders. If identified GPCs were mentioned in either ≥ 4 systematic reviews or ≥ 3 stakeholders' documents, these GPCs were regarded as relevant.

Results and Conclusions: We derived a list of 149 potential GPCs, of which 53 GPCs were classified as relevant. The main intervention/policy GPCs ($n=18$) fell into six categories: use of theory; participants; target behavior; content development/management; multidimensionality; practitioner/setting. Monitoring and evaluation GPCs ($n=18$) were grouped into six categories: costs/funding; outcomes; effect evaluation; time/effect size; reach; evaluation of participation and generalizability; processes/active components. Implementation GPCs ($n=17$) were grouped into eight categories: participation processes; training for practitioners; use/integration of existing resources; feasibility; maintenance/sustainability; implementation partnerships; implementation consistency/adaptation processes; transferability.

P3b.144

Parental Perceptions and Key Determinants of Sedentary Behaviour in children aged 2-11 years old.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: Engaging in sedentary activities often happens within the home environment where the family setting can determine the type and amount of sedentary behaviour that occurs. Parents are often viewed as the 'gatekeepers' of the time their children spend engaging in sedentary activities at home (e.g., TV viewing, electronic media use, physical activity, homework and social pursuits). There is limited evidence examining sedentary behaviours within a family setting, specifically in children aged 2-11 years, and qualitative studies are particularly absent. The purpose of this study was to explore parents' understanding of sedentary behaviour, their perceived influence on their children's sedentary behaviours at home and the key determinants of sedentary behaviour within a family setting.

Methods: Nineteen parents (4M, 15F; mean age = 37.3 ± 4.4 years) of children (15M, 4F; mean age = 6.6 ± 3.7 years) participated in either face-to-face or telephone interviews which lasted between 9-24 minutes. Inductive content analysis was used to identify overall themes and the researchers employed several methods of trustworthiness during the data analysis process.

Results: Three overall themes and eight first-order themes emerged from the interviews in relation to sedentary behaviours within the family setting. Findings indicated that parents, particularly mothers, are the gatekeepers to the prevalence and types of sedentary behaviours that children engage in at home. Role modelling, reinforcement and rules and restrictions influence the type of sedentary activities of children, particularly electronic media use, within the home.

Conclusions: Interventions to reduce sedentary behaviour in children should adopt a whole-family approach to modify the existing strategies already enforced by parents to ensure effectiveness. Specifically, identifying mothers' perceived barriers and facilitators to decreasing TV viewing and electronic media use within the home and educating older siblings on the benefits of engaging in non-sedentary activities at home could have a positive effect on younger siblings within the family setting.

P3b.148

"Chasing away the baby blues?" Investigating associations between physical activity, sedentary behaviour and postnatal depression risk

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Purpose:

Postnatal depression is a major cause of physical and psychosocial illness in new mothers. Physical activity (PA) has been found to reduce the risk of depression in the general population, yet little is known regarding associations between PA, sedentary behaviour (SB) and postnatal depression. Also unknown is whether the relationship between these behaviours and depression vary depending on perceived health status (which may be compromised after giving birth). This study aimed to investigate the association between PA, SB and postnatal depressive symptoms in first-time mothers. Furthermore, the potential moderating effects of perceived health were examined.

Methods:

Data were provided by 448 first-time mothers (approximately 3-months postpartum) enrolled in the Melbourne InFANT Extend trial. Women self-reported PA (time spent walking for leisure and transport, vigorous gardening, and other moderate and vigorous PA), SB (time sitting/watching TV), depressive symptoms (CES-D 10) and perceived health. Random intercept linear models, with mothers group as the level 2 identifier, examined associations between PA, SB and depressive symptoms, and moderating effects of perceived health.

Results:

Walking time and total PA time were found to be inversely associated with depressive symptoms ($B = -0.11$, 95% CI = -0.22 , -0.01 ; $B = -0.12$, 95% CI = -0.24 , -0.01 respectively), however these relationships did not remain significant in adjusted models. Moderation analyses showed that amongst those with better perceived health, walking time and total PA time were inversely associated with depressive symptoms ($B = -0.22$, 95% CI = -0.35 , -0.08 ; $B = -0.20$, 95% CI = -0.34 , -0.05 respectively). Amongst women who reported any gardening, there was a positive association between gardening time and depressive symptoms in those with poorer perceived health ($B = 0.02$, 95% CI = 0.000 , 0.003). No associations between SB and depressive symptoms were found.

Conclusions:

Some associations between PA and postnatal depressive symptoms were evident, however this was dependant on the type of activity and women's health status, suggesting further research is warranted. Since walking was linked with lower risk of depressive symptoms, it may be a feasible and accessible activity that is promoted in future interventions amongst new mothers aimed at reducing postnatal depressive symptoms.

P3b.149

A HOLISTIC MEASUREMENT MODEL OF MOVEMENT COMPETENCY IN CHILDREN

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Introduction: Different countries have their own methods for assessing movement competence in primary school aged children, but it is unclear whether the test batteries measure the same aspects of children's movement competence. The aim of this paper was to 1.) Investigate whether the Test of Gross Motor Development (TGMD-2) and Körperkoordinations Test für Kinder (KTK) are measuring the same aspects of children's movement competence and 2.) Examine the factorial structure of the TGMD-2 and KTK in a sample of Australian children.

Method: A total of 158 children aged 6-12 participated (M age = 9.5; SD 2.2). First, confirmatory factor analysis (CFA) examined the independent factorial structure of the KTK and TGMD-2. Second, whether locomotor, object control and body coordination loaded on the latent variable Movement Competency was examined.

Results: CFA indicated an adequate fit for both the KTK and TGMD-2. An adequate fit was also achieved for the final model $\chi^2(102) = 155.40$; $P = .001$; $\chi^2/df = 1.52$; CFI = .89; SRMR = .09; RMSEA = .06; PCLOSE = .24). In this model locomotor ($r = .86$), object control ($r = .71$) and body coordination ($r = .52$) loaded on movement competence.

Discussion: Findings support our hypothesis that the TGMD-2 and KTK measure discrete aspects of movement competence. Future researchers and practitioners should consider using a wider range of test batteries to assess movement competence. In addition, for children to be truly movement competent they should participate and be assessed in a wide range of activities.

P3b.150

The influence of housing characteristics on leisure-time sitting. A prospective cohort study in adults.

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SIG: Yes, Motivational Dynamics

Awards: Yes, for the Student Competition

Objective: Facing the health risks of being sedentary, there is an important potential for preventive approaches in identifying the relevant environmental correlates & determinants of sedentary behavior. In this perspective, an increasing body of research has focused on the built environment, relating domestic leisure-time sitting with e.g., land-use mix, green areas and walkability of the neighborhood. An indoor behavior is thus linked to an outdoor setting. Yet, attributes of the actual domestic environment may also influence the time spent sedentary at home. Therefore, the aim of this study was to examine if housing characteristics were cross-sectionally and prospectively related to leisure-time sitting in adults.

Methods: This study is based on the Health2006 cohort, counting 2308 adult men and women followed for 5 years. At baseline, subjects self-reported housing characteristics (habitat type, habitat surface area and household size), moderate-to-vigorous physical activity (MVPA) and socio-demographic factors. Leisure-time sitting (h/day) was self-reported at baseline and 5-year follow-up. Multiple linear regression analysis was used to assess cross-sectional associations at baseline and prospective relationships between housing characteristics at baseline and leisure-time sitting 5 years later.

Results: At baseline habitat surface area (<70 vs. > 110 square meters β :1.24 (se 1.04); $p < 0.0001$) and household size (1 vs. 5 persons β :1.38 (se: 1.05); $p < 0.0001$) were inversely associated with leisure-time sitting. Living in a flat was associated with significantly higher leisure-time sitting compared to living in a house (flat vs. house β :1.16 (se 1.02); $p < 0.0001$). Household size was a significant predictor of leisure-time sitting at 5-year follow-up in fully adjusted model (1 vs. 5 persons β : 1.24 (se: 1.05); $p < 0.0001$).

Conclusions: Habitat type, habitat surface area and household size were cross-sectionally associated with leisure-time sitting in adults. Among housing characteristics, only household size was a strong predictor of 5-year leisure-time sitting in adults after adjustment for MVPA and socio-demographic variables. These findings add knowledge to the understanding of the domestic leisure-time context, in which adults spend considerable proportions of their waking hours. Implications are that housing characteristics may be relevant to consider for structural strategies targeting a reduction in sedentary behaviors.

P3b.151

Physical Education students' sources of perceived PE Ability.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: The primary purpose of this study was to explore students' sources of perceived ability in Physical Education (PE). Perceived PE ability has been highlighted as contributing towards variable PE experiences and physical activity levels. Determining the sources of information that students draw upon to inform their perceptions of PE ability can assist stakeholders in enhancing pedagogical practices that provide a positive PE experience for all students.

Methods: Twenty in-depth focus group interviews were conducted in four secondary schools, three in the North West of England and one in London, as part of two detailed investigations into young peoples' experiences of ability in PE. Sixty-nine students (42 girls & 27 boys aged 11-16 years across a range of 'abilities') were purposefully selected to participate in this study, based on their teachers' normative ratings of their PE Ability. Focus group topics were developed from Welk's (1999) Youth Physical Activity Promotion Model, specifically around the predisposing factor of "am I able?" which encapsulates variables of how individuals think and feel about their abilities in the physical domain (e.g., perceived competence, self-efficacy & physical self-worth). Interviews lasted between 30-60 minutes; the discussions were recorded by dictaphone and later transcribed verbatim. Analysis was carried out using NVIVO and thematic analysis was employed to interpret the data. The project received institutional ethics committee approval.

Results: Analyses revealed a number of sources of perceived PE Ability including: external feedback; perceptions of skill; and comparison against peers. External feedback came from numerous sources for example: teachers; peers; awards and success. Perceptions of skill competence and incompetence were also apparent, and students compared themselves against their peers to gauge a sense of their ability.

Conclusions: Understanding the sources that students draw upon to inform perceptions of their ability is critical for stakeholders in informing how PE can be used to promote learning and enhance physical activity for all students. On this basis of these findings, PE teachers should develop awareness of how their practices impact upon student perceptions and provide students with positive and enjoyable experiences where all students can feel 'successful.'

P3b.152

Growth Trajectories of Individuals' Physical Activity, Sedentary Behavior and BMI from Adolescence through Young Adulthood

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SIG: Yes, Motivational Dynamics

Awards: No

Purpose: To examine changes in individuals' physical activity (PA) levels, sedentary behavior and body mass index (BMI) from adolescence through young adulthood, and whether gender moderates such changes. Additionally, analyses were conducted to examine the effect of individuals' trajectories of PA and sedentary behavior on their BMI over time.

Methods: Data from three waves of a longitudinal cohort study Project EAT (Eating and Activity in Teens and Young Adults; n=1902) were used to examine trajectories over 10 years. Moderate-to-vigorous PA (MVPA), sedentary behavior and BMI survey data were collected at baseline from students in Minneapolis/St. Paul public secondary schools (EAT-I: 1998-1999, mean age=14.9); at 5-year follow-up (EAT-II); and at 10-year follow-up (EAT-III). MVPA was calculated by summing the weekly hours of strenuous and moderate exercise; sedentary behavior was assessed by weekly hours spent watching TV/DVDs/videos and using computers; and BMI was calculated based on self-reported height and weight (kg/m²). Multilevel analyses charted changes in participants' MVPA, sedentary behavior and BMI across time.

Results/findings: In general, participants' MVPA declined gradually for both males (7.7 to 5.0) and females (6.1 to 3.7) (p = 0.07). However, their sedentary hours showed different change patterns, increasing by 4 to 5 hours from EAT-I to EAT-II in both genders, but decreasing by 3 hours in males and by 14 hours in females from EAT-II to EAT-III (p < 0.001). Participants' BMI increased over time by 3 units in males, 1.8 units in females (p < 0.001). Further, changes in males' MVPA were negatively and sedentary positively related to changes in BMI across time (p < 0.05). Similar relations held for females but changes in MVPA were only weakly related (p = 0.18) to changes in BMI from EAT-I to EAT-II.

Conclusions: Individuals' MVPA declined and BMI increased steadily for both genders from adolescence to young adulthood, but their sedentary behavior increased initially yet decreased after 5 years especially in females. Surprisingly, effect of MVPA change on BMI change was insignificant in females during the transition from adolescence to young adulthood. Findings may be interpreted through the perspectives of gender socialization and growth/maturation.

P3b.153

Motor Skill Proficiency level in an adolescent population – a new issue requiring methodological adjustment

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SIG: Yes, Policies and environments

Awards: No

Purpose:

Recent findings are now strongly supporting the idea of an association between Fundamental Movement Skills (FMS) proficiency and Physical Activity (PA) level (Bryant, James, Birch, & Duncan, 2014; Cohen, Morgan, Plotnikoff, Callister, & Lubans, 2014) with long-term consequences on PA participation (Barnett, van Beurden, Morgan, Brooks, & Beard, 2009; Hardy, Barnett, Espinel, & Okely, 2013). The issue currently raising itself is that before reaching FMS maturity level (Belton, O'Brien, Meegan, Woods, & Issartel, 2014; O'Brien, Issartel, & Belton, 2013), adolescents are engaging in sport specific skills in schools and leisure time. From a research perspective, while acknowledging this abrupt transition, one needs to take into account the age of this population and how it impacts on the measurement of the FMS proficiency. This study investigated whether current adolescent FMS proficiency levels fit a pre-established measurement model.

Methods:

Data were collected as part of the Youth-Physical Activity Towards Health (Y-PATH) project. Twenty four schools were recruited with a total of 841 participants (males = 455, females = 387) aged 12.76 years \pm 0.47. Twelve FMS were assessed: 6 locomotor skills (run, leap, gallop, slide, horizontal jump, hop) and 6 object control skills (dribble, catch, throw, roll, strike and kick) following the TGMD-2 protocol (Ulrich, 2000).

Results/findings:

Confirmatory Factor Analysis (CFA) shows that the TGMD-2 model with two constructs (locomotor and object control) provides a good fit for the collected data; confirming that these two latent variables can significantly predict the FMS proficiency level of adolescents. However, a better fit was found when removing 5 of the 12 skills reducing the test to four locomotor skills (run, gallop, hop and vertical jump) and three object control skills (bounce, kick and roll).

Conclusions:

While adolescent FMS proficiency levels fit with previously identified latent variables of object control and locomotor, our findings suggest that overall the FMS proficiency levels of adolescents are best measured by seven core skills. Focusing on the above-identified seven skills will better allow teachers, parents or coaches to target appropriate interventions or training programmes fitting the needs of this population.

P3b.156

Project Energise: Use of standing and moving strategies to reduce and break occupational sitting in Australian office workers

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objectives: *Energise* is an Australian Heart Foundation funded project which aims to test the feasibility of reducing and breaking occupational sitting in office workers. This mixed method study focused on the participatory action phase of the project, examining the types of stand and move strategies identified by workers, and the frequency with which these strategies were used prior to intervention.

Methods: Following baseline measures, 92 office workers (aged 43.9 \pm 11.8 years; 6.9 \pm 1.3 hours of self reported sitting/work day; 63 men) were invited to attend focus groups held at one of three city centre worksites (June-August 2014). During focus groups, evidence on the health hazards of occupational sitting were presented and ideas for stand and move strategies discussed. Ideas from each group were collated and themed by researchers to create a 'menu' of strategies. The menu was placed on-line and individual strategies rated by workers to assess frequency of use (1=never; 4=all the time). Mean scores were calculated and survey responses ranked for each theme and strategy.

Results: Sixty office workers (or 65% of those who completed baseline) attended focus groups, identifying 20 stand and move strategies, themed into four occupational contexts (desk tasks [x5]; meetings [x4]; work breaks [x7]; travel [x4]). 'Desk tasks' were the most frequently used set of strategies, with three-of-five strategies scoring highly (e.g. 'taking advantage of centralised office equipment; 3.3 \pm 0.8). 'Meetings' were the least used, with three-of-four strategies scoring poorly (e.g. walk-talk meetings; 1.3 \pm 0.9). Most 'work break' strategies were used moderately (e.g. planning a lunchtime walk; 2.6 \pm 1.1), although 'standing and moving during coffee or tea breaks' (3.2 \pm 1.1) was one of the most frequently used strategies across all four occupational contexts. Scores for 'travel' based strategies varied; workers used 'including a walk to and/or from work' frequently (3.0 \pm 1.1), while 'cycling to work' was used infrequently (1.5 \pm 1.1).

Conclusions: The study findings are useful for researchers and practitioners in that they identify a wide range of stand and move strategies for intervention testing and translation. Furthermore, the findings also highlight strategies and contexts often used by office workers and those where intervention efforts could be focused.

P3b.157

School transition in early adolescence reduces physical activity intensity: A longitudinal cohort study

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SIG: Yes, Socioeconomic inequalities

Awards: Yes, for the Student Competition

Purpose: Social-ecological theory highlights the connection between environments and health, yet there is little empirical evidence of the impact of changing school environments on physical activity (PA). The study purpose was to examine the effect of a change of school system on PA intensity, compared to students who did not change school environment.

Methods: Fifteen schools in Victoria, Australia were recruited from the bottom two strata of a five level socio-economic scale. In nine schools, students in Year 6 primary school transitioned to a different school for Year 7 secondary school, while in six schools, students remained in the same school environment from Year 6 to Year 7. Time1 (T1) measures were collected from students (N=245) in Year 6 (age 11-13). T2 data were collected from 243 (99%) of the original students when in Year 7. Physical activity data were collected subjectively (via survey) and objectively (via Actigraph accelerometer). School environment data were collected via school staff survey. Change of physical activity behaviour were conducted longitudinally i) for all students and ii) by change/no change of school. Mixed model regression analysis tested for behavioural interaction effects of changing/not changing school.

Results: Across all students, we observed declines in daily average moderate to vigorous physical activity (MVPA) (-4 min), light PA (-23 min), and self-reported frequency being very active in physical education classes, recess and lunch (all $P < 0.05$). School staff surveys identified that time allocated to recess, accessibility of sport equipment and encouragement of sport participation was greater in primary than secondary schools ($P < 0.05$). Sixty-three percent (N=152) changed schools from T1 to T2. Compared to students who remained in the same school environment, students who changed school reported a greater reduction in PA intensity at recess and lunch, but more encouragement to participate in sport, and teachers as better PA role models (all $P < 0.05$).

Conclusions: Transitioning from Year 6 to Year 7 generally impacts negatively on children's PA behaviour, and this is further compounded by changing school environments. Providing more supportive environments across the school transition appears critical to prevent further PA decline in adolescence.

P3b.158

A Systematic Review of moderate-to-vigorous physical activity levels in middle and high school physical education lessons.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Objective: Adolescence is well-recognised period of physical activity decline. A quality physical education (PE) program is a key component of school-based physical activity initiatives. A systematic review of middle and secondary school PE, published in 2005, indicated MVPA ranged from 27-47% of lesson time, lower than the US recommendation of 50% of lesson time. The current systematic review updates the previous review to determine if MVPA in PE has improved.

Methods: A protocol for the review was registered with Prospero. Studies written in English and published between 2005 to April 2014 were included. A two-step search strategy was used including: i) searching nine databases from 2005 to April 2014, and ii) manually searching reference lists of all included studies for additional papers not previously identified. Studies were eligible for inclusion if they were written in English; assessed physical activity of middle or high school students in PE lessons; and used a quantitative measure of physical activity (e.g. accelerometry, heart rate monitoring, pedometers or observational measures). Two reviewers examined all retrieved articles, assessed the methodological quality of included studies and performed data extraction using a standardised tool.

Results: Of 5132 potentially relevant articles, 28 studies involving more than 2607 students met the inclusion criteria (18 studies included in the meta-analysis). The number of PE lessons observed in a study ranged from 1 to 431. Thirteen studies measured MVPA through observational measures (e.g. SOFIT), 8 used accelerometers, 6 used heart rate monitors and 4 used pedometers, including 3 studies using mixed methods. Preliminary results of a meta-analysis showed students spent a mean of 38.5%, (95% CI [34.8 - 42.2%]) of lesson time in MVPA. Middle school students spent 52.1% of lesson time in MVPA compared to 34.9% in secondary schools. Results varied according to the measurement method.

Conclusion: The proportion of lesson time spent in MVPA has remained relatively stable since the previous review conducted in 2005. However, MVPA remains well below the USA recommendation of 50% of lesson time spent in MVPA. Interventions to increase the proportion of lesson time spent in MVPA are warranted.

P3b.159

Parents and teachers' perceptions of preschool children's physical activity in urban and rural South African settings

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SIG: Yes, Early care and education

Awards: No

Objective: To qualitatively investigate parents and teacher's perceptions of preschool children's physical activity and sedentary behaviour in rural and urban South African settings. This is formative work for the development of an intervention.

Methods: Focus groups (9) were conducted with parents and teachers in rural and urban communities, across the socio-economic spectrum. These were focused on exploring perceptions of levels of physical activity and sedentary behaviour of preschool children in their community, as well as how physical activity itself was conceptualised. Participants were asked about the barriers that they thought prevented physical activity and the development of gross motor skills, as well as about practical suggestions and considerations for developing an intervention.

Results: All participants considered physical activity an important factor for the health and education of preschool children. In low-income areas, it was considered an important indicator of a healthy child. Participants from high-income areas were more focused on developmental aspects. High-income participants also expressed confidence that their children benefited from adequate physical activity and gross motor skill development, while lower-income participants felt that the children were active enough, but lacked in gross motor skills development. Time was the predominant barrier facing parents in high-income areas, whereas safety (specifically crime and traffic) was a primary barrier in lower-income areas. In the lowest-income areas, lack of resources and training were also considered barriers. The high-income areas expressed that they didn't need an intervention, whereas low-income areas expressed strongly that they did. Specifically they said they need safe and supervised places for the preschool children to play, separate from older children (who were said to beat or abuse younger children). They also suggested training or trained instructors to help with gross motor skill development.

Conclusions: Our results confirmed some of our assumptions about the barriers to physical activity for preschool children, as well as where an intervention is most needed. It was, however, noticeable that regardless of income, well-trained teachers were resourceful enough to ensure children were physically active, even with limited resources. This may influence the intervention in terms of emphasising proper training over facilities and equipment.

P3b.160

The relationship between movement behaviors and weight status in different settings among toddlers and preschoolers

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Purpose: Movement behaviors vary on a spectrum from no/low to high intensity movement (i.e., sleep/sedentary time to moderate-to-vigorous physical activity (MVPA)). Both levels and patterns of movement behaviors have associations with weight status. However, limited information exists in the toddler and preschooler age range. Since just over 50% of Canadian children ≤5 years of age attend non-parental care, movement behaviors within and outside of the child care setting are important to consider. The purpose of this study was to examine the relationship between movement behaviors in different settings and weight status among a sample of toddlers and preschoolers.

Methods: This study uses baseline data collected in October/November, 2013 for a larger study examining revised Provincial Child Care Accreditation Program Quality Standards. Results are based on 92 children, aged 19-60 months from eight participating child care centers throughout Alberta, Canada. Movement behaviors in child care (i.e., sedentary time, light physical activity, MVPA, and frequency of 1-4, 5-9, 10-14, and ≥15 minute sedentary bouts) were measured using accelerometers. Movement behaviors outside of child care (i.e., screen and non-screen sedentary behavior, physical activity, and total sleep per day) were measured with a parental questionnaire. The questionnaire also gathered demographic information (i.e., age, sex, parental immigration status). Children's heights and weights were objectively measured to calculate age- and sex-specific body mass index (BMI) z-scores. Bivariate and multivariate multilevel linear regression analyses were used to examine relationships at $p \leq 0.05$.

Results: For bivariate models, age and frequency of 1-4 minute sedentary bouts were associated with BMI z-score. For multivariate model a negative association was observed between frequency of 1-4 minute sedentary bouts and BMI z-score ($\beta = -0.03$, 95%CI: -0.05 to 0.00), when adjusting for age, and accelerometer total wear time.

Conclusion: Null associations were observed between most movement behaviors, within and outside the child care setting, and weight status in this sample. These findings suggest that establishing healthy habits around movement behaviors during this period of life may be important in the primary prevention of overweight and obesity. The promotion of frequent short sedentary bouts during child care appears particularly important.

P3b.161

Correlates of active travel and associations with adiposity in rural India and Bangladesh

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Early Career Award

Objective:

To examine correlates of active travel and associations with adiposity in rural India and Bangladesh. Data from such rural populations in South Asia are scarce and these populations are increasingly affected by non-communicable disease (NCDs).

Methods:

Data were drawn from Chronic Disease Risk Factor Study, a community-based household study conducted in three locations of rural India (Goa, Chennai) and Bangladesh (Matlab). Study participants included 2,126 adults > 18 years sampled in 2011-13. Physical activity data were collected using the Global Physical Activity Questionnaire and active travel was defined as walking or cycling ≥ 150 minutes per week. Adiposity measures were overweight (BMI ≥ 25), high waist-to-hip ratio (≥ 0.9 for males, ≥ 0.8 for females) and high waist circumference (≥ 85 cm for males, ≥ 80 cm for females). Logistic regression was used to examine correlates of active travel and linear/logistic regression to examine associations with adiposity outcomes. Models were adjusted for age, sex, education, smoking, non-travel physical activity, oil and butter consumption, and region.

Results:

Overall 48.7% of the sample used active travel, ranging from 54.8% in Goa to 33.1% in Matlab and 28.0% of the sample had a high waist circumference, ranging from 32.3% in Goa to 24.7% in Chennai. Women were less likely to use active travel (odds ratio 0.25, 95% confidence interval 0.20;0.31). Smokers (1.36, 1.07;1.72) and those engaged in ≥ 150 minutes of work-based physical activity (1.71, 1.35;2.16) were more likely to use active travel. In fully adjusted analyses, active travel was not significantly associated with overweight (0.83, 0.64;1.08) but was associated with reduced likelihood of having a high waist circumference (0.77, 0.63;0.96) or high waist-to-hip ratio (0.72, 0.58;0.89).

Conclusions:

This study presents some of the first data on correlates of active travel and adiposity in rural South Asia. Women were found to be less likely to use active travel and similar to evidence from high income settings, associations were found between active travel and adiposity. Although causality cannot be inferred from these data, they suggest that strategies to encourage active travel may be important in dealing with NCDs in rural South Asia.

P3b.162

Analysis of the indirect effects of basic psychological needs and motivational regulations in the relationship between intensity, frequency and emotional response to exercise

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Purpose: People seem to struggle to reach the international recommendations for the warranted effects of physical exercise, reporting motivational causes. Hence, we set a study to analyze the indirect effects basic psychological needs (BPN) satisfaction and motivational regulations in the relationship between exercise frequency, intensity and emotional response to exercise.

Methods: Exercise frequency and intensity, BPN satisfaction, motivational regulations (autonomous and controlled) and emotional response (Positive/Negative Affect (PA/NA); Psychological Well-being/Distress (PWB/PD)) were measured through self-report in a sample of 807 health club members (40.50 \pm 13.54 years) averaging 2.61 \pm 1.29 exercise sessions/week. Serial multiple mediation models were used to evaluate the predictive value of exercise and motivational variables on the emotional response.

Results: Exercise frequency predicted PA (12.02% for autonomy model) and PWB (6.36% for controlled; 29.29% for autonomous models). The effects of frequency on PA/PWB response were partially explained by the autonomous regulations positive indirect effects. As for the negative emotional response, exercise frequency predicted NA (14.49% in controlled regulations model, positive indirect effects) and PD (17.90% in autonomous regulations model, negative indirect effects).

Exercise intensity predicted PA (16.29% in controlled; 20.60% in autonomous regulations models) and PWB (13.88% in controlled; 22.25% in autonomous models). BPN and autonomous regulations showed positive associations in these predictions. NA and PD were also predicted by intensity (12.25% in controlled; 15.14% in autonomous) and (2.78% in autonomous; 10.51% in controlled models). BPN and autonomous regulations presented negative associations with NA/ PD while controlled regulations presented positive associations.

Conclusions: Frequency and intensity are associated with stronger emotional responses. This is partially explained by BPN satisfaction and motivational regulations. Autonomous regulation plays an important role in the quality of exercise experience. Results refer to the importance of the development of need-supportive contexts in order to facilitate a better emotional response in exercise thus facilitating continuous adherence.

P3b.163

The descriptive epidemiology of strength training participation among Australian adults – preliminary findings from the Australian Health Survey: Physical Activity, 2011-12.

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SIG: No, this does not fit in any of the special interest groups

Awards: No

Objective: The 2014 Australian physical activity public health guidelines recommend that adults should do muscle strengthening activities on at least 2 days each week. However, few studies have reported on the prevalence of strength training (ST) among a large sample of Australian adults. This paper reports on the prevalence and sociodemographic variations in ST participation among Australian adults.

Methods: Summary data were drawn from the Australian Bureau of Statistics, Health Survey: 2011-12, which included a nationally representative sample of Australian adults. Data were collected by face-to-face interviews between August and September 2011. Participation in ST was assessed by having the participant report if they did any ST in the last week and, if so, how many times they participated in ST during this period. The proportions of the sample participating in ST two or more sessions per week (≥ 2 ST sessions/week) were compared by gender, age and selected sociodemographic variables.

Results: Data were available for 17,043 adults, aged 18-98 years. Overall, 77.2% (95% CI 74.2-81.8%) of the sample reported not engaging in ST. A total of 18.6% (95% CI 16.5-22.8%) reported ≥ 2 ST sessions/week. When compared to females, a greater proportion of males met the ST guidelines (15.2 vs 21.7%, $p < 0.001$). There was an inverse linear trend for ST participation to decline with age, with the highest proportion of adults meeting the ST guidelines aged 18-24 years (28.7%), and lowest among adults aged 75+ years (8.9%). The highest ST levels were observed among those who were sufficiently active for health (30.9%), had university education (29.7%), and excellent self-reported health (29.5%). In contrast, the lowest levels of ST were among those who were inactive (4.5%), had low education levels (7.7%), rated their health as poor (9.1%), and were current smokers (12.4%).

Conclusions: Over three quarters of Australian adults do no ST. In addition to continuing monitoring of population ST levels, future studies should examine the broader contextual influences on population-level ST participation. In particular, research should investigate the individual, social and physical environmental influences on ST, such as cost, motivation, social norms and access to and location of ST facilities.

P3b.164

Do Irish teenage girls underestimate their physical activity?

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SIG: Yes, Early care and education

Awards: Yes, for the Student Competition

Purpose:

Studies of physical activity (PA) consistently show that boys are more active than girls, and that physical activity declines with increasing age (Gavin et al., 2013; Woods et al., 2010). This study investigated whether this was the case across all domains of PA when measured both objectively and subjectively.

Methods:

All boys and girls in non-examination years (2nd and 4th year) in two typical single sex secondary schools in a provincial town in Ireland were recruited ($n = 362$, 87% of total; mean \pm SD age 14.23 \pm 1.16 years). The International Physical Activity Questionnaire for Adolescents (IPAQ-A; www.ipaq.ki.se) was used to measure self-reported PA. One class from each of the year groups was randomly selected to participate in objective assessment of PA using ActivPal accelerometers ($n = 96$), and 81% consented ($n = 78$, 49% boys, 51% girls). The IPAQ-A was filled out on the day of return of the monitor so both methods refer to the same time period.

Results:

Using the objectively measured ActivPal data there was no significant difference in total PA between boys and girls (118.41 \pm 32.03 and 117.21 \pm 40.49 mins/day respectively, $p = .901$), or in mean PA between the age groups (13/14 year olds 118.27 \pm 32.26 and 15-16 year olds 117.55 \pm 38.96, $p = 0.944$). IPAQ-A total PA time was higher for the total group, boys, and the 15-16 year olds than ActivPal PA. Total IPAQ-A PA for girls was 20 minutes lower than ActivPAL PA. Girls were the only group to underestimate their total PA in the self report tool compared to ActivPal measures (17% lower). Older adolescent girls underreported total PA by 30% compared to ActivPal measures.

Conclusions:

Girls may under-report their PA due to under-confidence in relation to PA. These higher levels of objectively measured PA in girls were in spite of girls engaging in significantly less PE time than boys. The lack of an age difference in PA may be because the 4th year in Irish schools is a gap from the traditional academic focus, allowing opportunities for students to be more active. These findings buck previous trends of lower PA in girls, and particularly older girls.

P3b.165

Acute effect of an exercise session on inhibition control in obese adolescents: A randomised crossover trial.

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SIG: No, this communication does not fit in any of the SIGs

Awards: Yes, for the Student Competition

Purpose: Exercise enhances executive control, so it is unsurprising that obese adolescents - who are likely to be inactive - often report deficits in an important facet of executive functioning, inhibition control. To optimise the value of intervention programmes for obese young people, planners need to understand how acute programming factors influence inhibition control. This study will investigate the acute effects of a single session of exercise on inhibition control in obese adolescents attending a residential weight-loss camp.

Method: Participants were block randomized into a 2x2 crossover trial, Exercise-then-Class or Class-then-Exercise, conditions were assessed 3-4 days apart. Duration and intensity of exercise was assessed throughout using Actigraph GT3+ accelerometers. The exercise session consisted of a fitness-based circuit (45 minutes) while the classroom session was a sedentary lesson focused on identifying social support networks (45 minutes). Inhibition control was assessed immediately before and after each session using the iPad Bajaj (2013) Stroop colour word test. Each completer undertook four tests. Data were pooled by session; Wilcoxon signed-rank tests ($p < 0.05$) assessed all differences.

Results: Twenty-eight participants ($n=17$ females, age 13.6 ± 1.85 yrs, BMI z-score 3.05 ± 0.82) completed the trial. The mean MVPA in the Exercise sessions was 17.47 ± 8.7 mins. Within session, cognitive processing speed improved significantly (Exercise; Pre Mdn 10.8sec v Post Mdn 7.34sec, $z = -2.94$, $p = 0.003$, $r = -0.39$, Class; Pre Mdn 10.42sec v Post Mdn 6.23sec, $z = -2.53$, $p = 0.011$, $r = -0.34$). There was no significant difference between the improvements (post minus pre) in cognitive processing speed between the Exercise (Mdn = -5.01sec) and Class sessions (Mdn = -2.54sec, $z = 1.0$, $p = 0.316$, $r = 0.13$). No significant changes were observed in the 'Stroop off' condition either within- or between-sessions, indicating no familiarisation effect.

Conclusion: Uniquely, the current study assessed acute changes in inhibition control of obese adolescents using a "real world" exercise session. Significant equivalent improvements were observed in inhibition control across both Exercise and Class sessions. The results are consistent with previous work established in non-obese children showing the value of physical activity on inhibition control. The current study demonstrates that a time-matched exercise class generates equivalent benefits for inhibition control as a sedentary but cognitively demanding lesson.

P3b.166

How do dogs encourage and motivate walking? Results from RESIDE.

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SIG: No, this communication does not fit in any of the SIGs

Awards: No

Objective:

Many households own pet dogs and there is considerable evidence that people who walk their dog are more physically active. However, many dog owners do not walk their dog and thus there is a need to identify intervention strategies for increasing dog walking. The most important factors associated with dog walking are the perceived support, motivation and obligation the dog provides for walking. Dog-related factors (e.g., dog size, age, health) are also important however studies to date have had mixed findings. The aim of this study was to re-examine a well-characterised dog walking dataset and model dog-related demographic and behavioural factors that contribute towards this strong sense of encouragement, obligation and motivation to walk the dog, which we call 'The Lassie Effect'.

Methods:

Data from a cross-sectional survey of 629 dog owners participating in the RESIDE study in Western Australia were analysed. The outcome variables of interest included 'Dog encouragement to walk' and 'Dog motivation/obligation to walk' and were collected using the Dogs And Physical Activity (DAPA) Tool. Multivariable logistic regression analyses were used to examine dog-related, cognitive and owner-demographic factors associated with each of these two outcomes.

Results:

Larger dog size; increased level of attachment to dog; knowing dog enjoys going for a walk; belief exercise keeps dog healthy; and social support from family to go walking in past month was associated with higher odds of 'Dog encouragement to walk' and 'Dog motivation/obligation to walk'. Perceived dog-specific barriers to walking with dog daily; child being the main person who walks with the dog; and children at home <18yrs (barrier) was associated with lower odds of 'Dog encouragement to walk' and 'Dog motivation/obligation to walk'. In addition, the belief walking reduces barking was associated with higher odds, and dog overweight; dog too old/sick; spouse/partner being the main person who walks with the dog was associated with decreased odds of 'Dog motivation/obligation to walk' only.

Conclusions:

In conclusion, our findings confirm that dog-related factors can affect the pathway to dog walking behaviour, and also suggests that there may be separate factors influencing encouragement and maintenance of dog walking.

P3b.168

A formative evaluation of UWALK health promotion videos

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SIG: Yes, e- & mHealth

Awards: No

Purpose: The purpose of this formative evaluation was to examine the effectiveness of two videos developed as part of a media campaign for the UWALK provincial physical activity project in Alberta, Canada.

Methods: Six focus group (n=25) interviews were conducted, which included two physically active (n=8), two physically inactive (n=9) and two mixed (n=8) focus group sessions. A series of questions was developed in advance to explore participants' understanding of physical activity; where participants look for physical activity information; the positive and negative aspects of the UWALK videos, and the perceived credibility of UWALK. Interviews were recorded, transcribed verbatim and analyzed using content analysis. Multiple coders, peer debriefing, and an audit trail were used.

Results/findings: The focus group participants identified walking and activities of daily living as common modes of physical activity with many benefits including improved health and wellbeing. Many participants associated dog ownership with being physically active. Barriers varied according to activity status of the participants. The themes that emerged regarding health promotion videos after viewing two UWALK promotional videos included: 1) spirit of the video, 2) style of the video, and 3) brand. Positive, humorous and catchy videos were recommended. The preferred style (e.g., cartoon vs. real people) of video varied. Overall, brand was questioned. The degree of recognition, establishment and understanding of the brand was integral to the uptake of the video. Participants identified the purposes of the videos as move more and register at UWALK.ca. The degree of credibility of UWALK varied according to groups. Discussion surrounding the strengths and weaknesses of listing the provincial government and a single University as part of a provincial campaign was identified and discussed by focus group members.

Conclusions: Formative research is an integral component in the development of a media campaign (Bauman, et al., 2006). This study can inform other researchers and campaigns on formative evaluation methods and share the lessons learned from UWALK for the development of future campaigns.

P3C.169

Profiling sedentary and non-sedentary young men - a population-based MOPO study

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SIG: Yes, Motivational Dynamics

Awards:

Purpose: Physical inactivity and sedentary behavior are associated with adverse consequences on wellbeing in youth, and have been shown to track from youth into adulthood. Several factors have been suggested to be associated with inactivity among youth. This study aims to profile sedentary and non-sedentary groups of young men and to clarify their differences in physical, behavioral, social, and environmental factors. This research is a part of the larger cross-sectional MOPO-study which assesses health and wellbeing of young men.

Methods: A total of 622 men with mean age of 17.9 (SD 0.6) years attending compulsory conscription for military service in 2010 attended a cross-sectional study and completed a questionnaire on socioeconomic situation, physical and mental health, health behavior, physical activity, leisure-time sedentary behavior, and Internet use. They underwent a physical (body composition, muscle and aerobic fitness) and medical examination. The statistical significance of the differences between sedentary and non-sedentary groups was determined using cross-tabulation and chi-squared test for the categorical variables and the Student's t-test for the continuous variables. Profile groups were formed by principal component analysis (PCA) and named by the nature of the variables loaded into each group.

Results/findings: A total of 179 men were sedentary (daily leisure time sitting ≥ 5 h) and 172 men non-sedentary (sitting ≤ 2 h). The non-sedentary men had less body fat, better muscle and aerobic fitness, less depressive symptoms, and better life-satisfaction. Their self-rated health and fitness and eating habits were better and they were less engaged in binge drinking than sedentary men. The young men in sedentary and non-sedentary categories both reported motives to exercise. According to PCA, very distinct components (profile groups) with factor loadings >0.4 were identified for sedentary: "Exercising but sitting," "Feeling unhappy," "Symptoms of disordered eating," "Being unfit with exterior motivation," and "Gaming." The components for non-sedentary young men were "Exercising," "Feeling unhappy," "Gaming," "Unhealthy diet," and "Symptoms of disordered eating."

Conclusions: Multiple factors underlie both physically active and inactive lifestyles and these partially overlap. Recognizing individual patterns and underlying factors of the sedentary lifestyle is essential for tailored health promotion and interventions.

P3C.170

Pupil perceptions of a more active and movement centred pedagogy in teaching and learning.

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SIG: Yes, Early care and education

Awards:

Objective:

This pilot research aims to look into the effect and potential impact of introducing more focus on active and movement centred approaches to teaching and learning in one particular primary school in Hedge End, Hampshire. Kinaesthetic or active learning allows a pupil to focus and concentrate for longer on tasks and retain information more effectively (Smith and Parr 2006; Butler and Griffin 2010). Chambers (in Armour 2011) also looks at active learning as a prerequisite to the idea of constructivism whereby the active nature of tasks allows pupils to create their own meanings and a deeper understanding of concepts. Movement in education for health is also pertinent with Chaput et al (2014) calling for the importance of all movement behaviours to be considered, especially in children as light-intensity physical activity (LPA) can provide significant health benefits and is more realistic to embed into the school curriculum than moderate to vigorous physical activity (MVPA), the dominant recommendation thus far.

Methods:

This phase of the research collected views and opinions on the potential impact of these innovations from the pupils using focus groups (n = 6) with one year 4 class (n = 26). The focus group techniques complied with the nature of the research and utilised active and movement based pedagogical approaches to promote and stimulate discussion and illicit opinions on the subject.

Results:

Initial results have shown that pupils are keen to try a variety of movement based approaches to teaching and learning and are receptive to working more creatively and in a variety of spaces and environments. Results will be used to inform the Senior Leadership Team to innovate the teacher training regime and the cross curricular delivery to all year groups.

Conclusion:

It would seem that an appropriate all movement behaviour paradigm (Chaput et al 2014) would be helpful to aid in the health and wellbeing of pupils in a school based environment. Future direction will encompass follow up semi-structured interviews with Teachers to ascertain the training needs and how realistic and effective a change of focus in the curriculum would be

P3C.171

Noncommunicable Disease Prevention and Control in Mongolia: A Policy Analysis.

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SIG: Yes, Policies and environments

Awards:

Objective: Noncommunicable diseases (NCDs) are the major global causes of morbidity and mortality. In Mongolia, a number of health policy documents have been developed targeting the prevention and control of noncommunicable diseases. This paper aimed to evaluate the extent to which NCD-related policies introduced in Mongolia align with the World Health Organisation (WHO) 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of NCDs.

Methods: We conducted a qualitative review of policy documents introduced by the Government of Mongolia from 2000 to 2013. A literature review, internet-based search, and expert consultation identified the policy documents. Information was extracted from the documents using a matrix, mapping each document against the six objectives of the WHO 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of NCDs and five dimensions: data source, aim and objectives of document, coverage of conditions, coverage of risk factors and implementation plan. 40 NCD-related policies were identified.

Results: Prevention and control of the common NCDs and their major risk factors as described by WHO were widely addressed as were the objectives of the WHO 2008-2013 NCD Action Plan for the Global Strategy for the Prevention and Control of NCDs. Many documents included explicit implementation or monitoring frameworks. It appears that each objective of the WHO 2008-2013 NCD Action Plan was well addressed. Areas less well or/and not addressed were chronic respiratory disease, physical activity guidelines and dietary standards.

Conclusions: The Mongolian Government response to the emerging burden of NCDs is a population-based public health approach which includes a national multisectoral framework and integration of NCD prevention and control policies into national health policies. Our findings suggested gaps in addressing chronic respiratory disease, physical activity guidelines, specific food policy actions restricting sales advertising of food products, and a lack of funding specifically supporting NCD research. The neglect of the gap areas may hamper addressing NCD burden, and needs immediate actions. Future research should explore the effectiveness of national NCD policies and the extent to which the policies are implemented in practice.

P3C.172

Physical activity alone or paired with TV viewing: effects on enjoyment of physical activity and TV, exercise self-efficacy, and barriers to being active in overweight adults

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SIG: Yes, Motivational Dynamics

Awards:

Objective: Physical activity (PA) is enjoyable, but there are barriers to participation. TV viewing is highly enjoyable with limited barriers. Exercising while viewing TV may impact enjoyment, exercise self-efficacy, and barriers to PA, compared to exercising without TV. The present study examined the effects of the two different PA prescriptions: one that increased PA during TV viewing (TV Commercial Stepping), and another that focused solely on PA (Walking), on enjoyment of TV viewing and PA, perceived exercise self-efficacy, and barriers to being active across time. We hypothesized that both PA prescriptions would increase the enjoyment of PA, increase exercise self-efficacy, reduce barriers to being active, and that the enjoyment of TV would increase in those that paired PA with TV viewing time, but no change in enjoyment of TV was expected for those doing PA alone.

Methods: 58 sedentary, overweight adults were randomized to one of two PA prescriptions: TV Commercial Stepping, and Walking. Over 6 months, participants in both groups received a standardized PA intervention using behavior modification principles. Participants were instructed to increase their PA to at least 150 minutes/week through their PA prescription. Random effects models tested changes in enjoyment of TV and PA, exercise self-efficacy, and barriers to PA across time (baseline, 3, and 6 months) and PA prescription.

Results: At baseline, TV was more enjoyable than PA. Over the 6-month intervention, enjoyment of TV viewing did not change, but enjoyment of PA and exercise self-efficacy significantly increased, while barriers to PA significantly decreased for both groups compared to baseline ($P < 0.05$).

Conclusions: These findings highlight the importance of encouraging inactive adults to engage in some form of PA, whether it occurs with or without TV viewing. Because viewing TV while exercising increased the enjoyment of PA, exercise self-efficacy, reduced barriers to being active as much as PA without TV, the likelihood of long-term maintenance of PA paired with TV could be promising considering the amount of time adults devote to TV viewing. However, PA promotion interventions may be equally successful if they provide individuals enjoyable PA alternatives to viewing TV.

P3C.173

Neighbourhood socioeconomic deprivation and its relation with harmful health environments in the Lisbon Metropolitan Area, Portugal

Helena Nogueira

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Research suggests that poor health status can be attributed to disadvantaged environments which emerge in socioeconomic deprived neighbourhoods magnifying individual vulnerability - the deprivation amplification hypothesis. This hypothesis argues that socioeconomic deprivation is characterized by low availability of resources and amenities and low levels of security thereby limiting their residents' access to material resources, life opportunities and amenities and reducing social capital and cohesion, with impacts on the healthy related behaviours of the poorest. Our aim was to investigate whether the availability of resources and facilities that promote active and healthy behaviours is lower in deprived neighbourhoods of the Lisbon Metropolitan Area (LMA, $n=216$), creating an obesogenic environment that reinforces individual vulnerability.

Methods: An index of area deprivation was created through standardization and categorized into five quintiles. Neighborhood characteristics related to land use, urban design, transportation and social organization (e.g. physical activity, familiar/social support and high street facilities, food retail stores, schools, health services, social capital levels and access to public transport) were observed by quintiles of area deprivation. Density variability between quintiles was compared with ANOVA; differences between extreme quintiles were assessed using the Mann-Whitney U test.

Results/findings: In a total of 62 local resources and facilities, 42 (67.8%) are scarce in the most deprived neighborhoods. Few resources elude the general pattern and only four (6%) showed a higher prevalence in the poorest areas.

Conclusions: We concluded by the emergence of a deprivation amplification model in the LMA whereby poor people deal daily with lack of resources needed to live a healthy, active life. This scarcity shapes an unequal and impoverished environment which is potentially harmful to the health of the lower SE groups.

P3C.175

Sedentary behaviors in the Portuguese population: an exploratory study about screen-time patterns in school-aged children

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SIG: Yes, Children and families

Awards:

Evidence suggests that sedentary behaviors are associated with increased health risks. The main purpose of this study was to describe the leisure-time sedentary behavior and its association with socio-demographic indicators of 6-10 year old Portuguese children. Leisure-time sedentary behaviors were assessed using a version of a parental self-report questionnaire (N=443, 47.9% boys, and a mean age of 7.66) distributed in three schools at Coimbra, Portugal. Three leisure-time sedentary behaviors were assessed: television (TV) viewing, computer (PC) using, and playing with electronic devices (EID) over different times of the week: weekdays, Saturdays, and Sundays. Parents reported some socio-demographic data. TV viewing occupied the most leisure-time, followed by PC, and EID. Most of these behaviors occurred on Saturday except for TV, which reached its highest time viewing on Sunday. Looking for the overall time in sedentary behavior we did find some statistical differences according to sex ($p=0,005$) and a tendency when it comes to age ($p=0,075$) but none according to children's engagement in an extracurricular sport activity or parents' scholar degree. Boys tend to engage in more sedentary behavior mainly because they spend much more time than girls playing with electronic devices ($p0,001$). Older kids spend more time using PC ($p=0,003$) than younger ones and we can even see that difference when analyzing the month of birth: children whose birthday occurs during the first trimester (older during the data collection) spend more time on PC ($p=0,004$). Children engaged in any extracurricular sport spend more time playing EID on Saturdays ($p=0,036$) and Sundays ($p=0,035$) maybe because kids who not play sport are engaged in other kind of activities during the weekends. Mother's education was positively associated with the time their kids watch TV on Saturdays ($p=0,013$); and fathers with higher education level have kids who spend more time using computer during the weekend ($p=0,005$ for Saturdays and $p=0,017$ for Sundays). We found different patterns depending (according to sex, age, participation in extracurricular sports and level of parental education) on the type of sedentary behavior. Future studies should consider a wide range of sedentary behaviors and incorporate objective measures to quantify sedentary time.

P3C.176

Effectiveness of interventions targeting physical activity, nutrition and healthy weight for university and college students: A systematic review and meta-analysis.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objectives:

To examine the effectiveness of interventions aimed at improving physical activity (PA), diet, and/or weight-related behaviours amongst university/college students.

Methods:

An electronic search was performed on health-focused intervention studies carried out in tertiary level educational institutions and published between 1970 and 2014. Articles published in English and peer reviewed journals were considered. Interventions deemed eligible for inclusion had to be implemented within a tertiary education setting and have the aim of improving PA and/or dietary intake and/or weight.

Results:

Overall, 41 studies met the inclusion/exclusion criteria. Risk of bias assessment indicated eight studies had a high risk of bias, 30 were considered neutral, and the remaining four had a low risk of bias. Most studies reported at least one significant improvement in a health outcome. At least half of the studies for PA and nutrition reported positive significant outcomes. 18/29 studies examining PA found significant effects including increased PA minutes, an increase in the number of days participating in PA and in exercise duration, increased METs and PAR-Q scores and a decrease in barriers to exercise. Meta-analysis results revealed the studies targeting moderate PA demonstrated significantly greater moderate PA levels in the intervention group compared to the control group (post intervention). 50% of the nutrition studies reported significant improvements, including improved diet quality, increased fruit, vegetable and wholegrain intake, and healthy fats and a reduction in overall fat intake and calories. Of the studies examining body weight, 4/12 resulted in significant outcomes including reductions in weight, BMI, and WHR and/or an increase in the number of participants trying to lose weight.

Conclusions:

Students within the university/college setting are an ideal target for lifestyle interventions aimed at improving health behaviours. Within this setting, students are often surrounded by an abundance of research expertise, multi-disciplinary health professionals, and world-class facilities and resources making this potentially an ideal health-promoting environment. Therefore, there is significant scope for implementation of lifestyle interventions to improve the health of this group of our population.

P3C.177

Brain functioning in Parkinson's Disease patients relates to changes in aerobic fitness

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SIG: No, this does not fit in any of the special interest groups

Awards:

Background:

Parkinson's Disease (PD) is characterized by progressive motor and cognitive dysfunctions resulting from the loss of dopaminergic signaling in the brain and abnormal cortico-striatal functioning. Recent animal PD research has demonstrated improved neural functioning following controlled aerobic physical activity (PA) interventions. Yet evidence from human PD research is sparse.

Objective:

In the current study we employed functional Magnetic Resonance Imaging (fMRI) to investigate the effects of a 3-month PA intervention on the pattern of brain activation in PD patients during motor skill learning. Importantly, these changes in brain functioning were regressed against the changes in aerobic fitness to ascertain that the effects were related to the PA intervention.

Method:

Nineteen early stage PD patients with low levels of PA participated in a supervised stationary cycling intervention program (3 times/week for 12 weeks). Duration and intensity progressively increased starting from 20 minutes and 60% intensity (based on participant's VO₂ peak) until 40 minutes of 80% intensity was reached. Before and after the PA program, aerobic fitness was evaluated and participants were scanned while performing an implicit serial reaction time task. Functional brain images were preprocessed and analyzed using the SPM8 software. Changes in brain activation were estimated by a model contrasting the post versus pre brain responses to the learned versus the random motor sequence.

Results

Overall, the PA intervention resulted in a significant improvement in aerobic fitness ($p=.002$) and motor learning performance ($p=.02$). Importantly, fMRI results revealed a significant change of the neural network being recruited during motor learning. Related to the fitness improvements, activation significantly increased in the left putamen and bilateral hippocampus and decreased in both cerebellar hemispheres.

Conclusions

This study is the first to show plastic effects in motor learning-related brain functioning following a PA program in PD patients. Results suggest that PA should be encouraged in the treatment of PD patients as it promises to improve not only physical functioning but also neurocognitive functioning and thus to positively impact their quality of life.

P3C.178

Clustering of physical activity, sedentary and cardiorespiratory fitness and associated factors among Brazilian adolescents: ELANA Study

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Evidence suggests possible synergetic effects by multiple lifestyle behaviors on health risks. This study examined the prevalence of clustering of physical activity, sedentary behavior and cardiorespiratory fitness among Brazilians adolescents and investigated factors associated.

Methods: The study is based on data from the "Adolescent Nutritional Assessment Longitudinal Study (ELANA)" conducted among elementary school students from six schools in Rio de Janeiro. ELANA was conducted in 2010, 2011, 2012 and 2013. For the present study we analyzed baseline data (2010) for 703 adolescents aged between 10 and 19 years. For the establishment of clusters, physical activity was evaluated by the International Questionnaire of physical activity (IPAQ); sedentary behavior was obtained by questions about daily time in front of the television from self-report questionnaire and cardiorespiratory fitness was measured by the 9 minutes run/walk test. We tested associations with the following factors: gender (male; female), expected age for elementary school (11 years; different ages), type of school (private, public) and Body Mass Index (BMI) (normal; overweight/obesity). We used the Ward and K-means methods for the cluster analyzes and multinomial logistic regression to study the associations, estimating the odds ratio and confidence intervals (CI 95%).

Results: Cluster resulted in four-cluster solutions: C1: unhealthy behaviors and higher cardiorespiratory fitness (30,6%); C2: unhealthy behaviors, however not sedentary (32,4%); C3: all undesirable behaviors (23,6%); C4: all healthy behaviors (13,4%). Girls were 4.7 (95% CI 2.8- 8.1) and 3.4 (95% CI 2.0-6.0) more likely to be allocated in the C2 and C3, respectively, than boys. Private school students were 2.2 (95% CI 1.3- 3.7) more likely to be in C1, when compared to public schools students. No significant associations were found with other factors.

Conclusion: In order to develop effective primary prevention strategies, it would be important to consider multiple health indices when identifying high risk groups.

P3C.179

A pilot study to determine the most popular lifestyle smartphone apps and willingness of the public to share their data with researchers

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SIG: Yes, e- & mHealth

Awards:

Objectives: This pilot study aimed to determine which lifestyle (applications) apps and wearable devices were most commonly used, for what purpose, and the attitudes of individuals towards sharing their personal data with researchers for the public good.

Methods: A cross-sectional, web-based survey was conducted amongst university staff and students 18 years and over. The 35-item survey included questions about participants' self-tracking patterns; the types of lifestyle apps and wearable devices used; how the personal data collected could be useful to them; their views on privacy; and any restrictions they would impose on sharing personal data. Responses were tabulated and analysed for trends, and open-ended questions were thematically coded.

Results: The survey was attempted 133 times, with 101 completed surveys included for analysis. Survey completers were predominately aged between 18-25 (66%); female (83%); and tertiary educated (54%). On average 3.1 (SD=1.9) lifestyle apps were installed by current app users (n=85). The majority of current app users (n=69) had lifestyle apps addressing three or fewer lifestyle topics, whilst only eight users had apps which tracked all four weight-management topics (physical activity, nutrition, weight and sleep). User engagement with personal data was primarily for self-monitoring and least for comparison with others. Of the 91 lifestyle app and wearable device options, MyFitnessPal, MapMyRun, Nike+ and Fitbit were most popular. Participants who used these apps and devices were more likely than non-users to be definitely willing to share their data with researchers to enable the study of population health behaviours. Participants identifying themselves with the 'quantified self' movement and those who self-tracked using social media-oriented websites were also willing to share. However, participants not of the 'quantified self' movement had greater concerns about privacy and more likely viewed keeping personal data anonymous as extremely important.

Conclusions: Participants were willing to share personal data and thereby increasing the potential for these data to transform health research; the provision of more targeted program development; and for monitoring in behavioural nutrition and physical activity studies. Thus ongoing advocacy from researchers to commercial app companies for access to this data is warranted.

P3C.180

Norwegian National Center for Food, Health and Physical Activity: An investment in the kindergartens and schools effort to increase health and learning in children

Ingrid Leversen
National Centre for Food, Health and Physical Activity, Bergen, Norway

SIG: Yes, Policies and environments

Awards:

Objective: The National Centre for food, health and physical activity is created as cooperation between the Ministry of Health and Care Services and the Ministry of Education, to help ensure that national education and health policies are initiated and implemented. The Centre provides knowledge and guidance about the importance of healthy nutrition and daily physical activity as an integrated part of pre-school and school life for the children's health and learning. The goal is to reinforce the role of kindergarten and school as health promoting, preventive and inclusive environments, and to help reduce social inequalities.

Methods: The Centre's audience is authorities, owners, managers and personnel in kindergartens, schools, public health centres and the school health services, and staff at universities and university colleges providing associated educational content. The Centre uses a bottom-up approach and promotes and communicates the relationship between physical activity and healthy nutrition, and children's health and learning outcomes to its primary audience.

Results: The Centre undertakes targeted communications, counselling and guidance based on results from research and developmental work, and is developing support materials that are predominantly presented net-based. Examples of resources are: video on how to stimulate to a healthy motor development in children; a mapping tool for food and meals in kindergartens; health gaming as alternative ways of being physically active through the use of digital devices, and resources about the use of local partnerships and green spaces in the community close to the schools, in order to increase physical activity, health and well-being.

Conclusions: The Centre is a highly recognized contributor to the qualitative work and increased focus on physical activity, health and nutrition in kindergartens and schools. Accordingly, the Centre has proved essential with a sought after voice both towards the practice field, and also towards politicians and decision makers as contributing partners in the development of curricula and national guidelines.

P3C.181

Association of household food security status with use of community food sources in neighborhoods of high poverty and obesity in the southeastern U.S.

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University of South Carolina, Columbia, SC, USA

SIG: Yes, Socioeconomic inequalities

Awards:**Objective:**

We examined the associations between household food security (HHFS) and community food sources in communities of high poverty and obesity. Food-insecure households have food intake of one or more members reduced and eating patterns disrupted at times during the year because the household lacks money and other resources for food (US Department of Agriculture (USDA)). Hypothesis: Food-insecure households will be more likely to use food from non-supermarket community sources than food-secure households.

Methods:

Family food shoppers recruited from seven census tracts in South Carolina (six USDA-designated «food deserts») completed 45-minute interviews. Across tracts 28-62% HHs were below federal poverty level, 64-89% were single female headed, and 43-100% of residents were African American. Main measures were USDA Guide to Measuring Household Food Security and questions from USDA National Household Food Acquisition and Purchasing Survey. Respondents (n=532) were 92.5% African American; 79.5% women; 75.1% unmarried; 78.6% overweight/obese. Mean age=52.2, SD=14.4, minimum,maximum=19.0,94.3. Educational level was 31.2% < high school, 37.8% high school, 25.6% post-high school, 5.5% college graduate. HHFS was 16.7% high, 20.9% marginal, 32.3% low, 30.1% very low; 65% HHs received Supplemental Nutrition Assistance Benefits (SNAP). Analysis included Chi-square, general linear and logistic regression models adjusted for gender, race, education and HH income.

Results:

HHFS was not associated with respondent race, gender or BMI category. Lower HHFS was associated with lower education ($p=.004$) and HH income ($p<.0001$). With high FS as the referent, HHFS status was not associated with food purchased at farmers' markets ($p=.68$) or food from home garden/animals ($p=.16$), home-delivered meals program ($p=.19$), seniors' center ($p=.83$), or hunting/fishing/trapping ($p=.96$). Lower FS households had significantly greater odds for food from food bank/pantry (ORs=4.3 marginal FS, 3.4 low FS, 6.5 very low FS), family/friends (ORs=2.3 low, 4.4 very low), community garden (ORs=4.7 marginal, 5.9 low, 6.4 very low), church/social services (ORs=2.8 marginal, 2.8 low, 3.1 very low), soup kitchen/shelter (ORs=3.0 marginal, 4.1 very low) and receiving SNAP benefits (ORs=2.0 marginal, 2.4 very low).

Conclusion:

Food-insecure households need to obtain food from non-supermarket sources, including emergency sources, indicates impaired control over dietary choices, with implications for obesity and chronic disease prevention initiatives.

P3C.182

Healthy obesity and objective physical activity

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Disease risk is lower among metabolically healthy obese adults compared with their unhealthy obese counterparts. Studies considering physical activity as a modifiable determinant of healthy obesity have relied upon self-reported measures which are prone to inaccuracies in recall and do not capture all movements which contribute to health. We aimed to clarify the role of physical activity in healthy obesity by examining differences in total and moderate-to-vigorous physical activity between healthy and unhealthy obese groups using both self-report and novel wrist-worn accelerometer assessments.

Methods: Cross-sectional analyses were based on 3457 adults aged 60-82 (77% male) participating in the British Whitehall II cohort study in 2012/13 (70.8% of eligible sample). Adults were considered normal-weight, overweight, or obese based on standard World Health Organization (WHO) body mass index criteria, and were considered 'healthy' if they had < 2 of the following risk factors: hypertension, low HDL cholesterol, high triacylglycerol, high blood glucose, and insulin resistance. Using both questionnaire- and wrist-worn tri-axial accelerometer (GENEActiv)-based assessments of physical activity, differences across groups in total physical activity were examined using standardised units and linear regression models. Differences in the likelihood of meeting 2010 WHO recommendations for moderate-to-vigorous activity (≥ 2.5 hours/week) were compared using Poisson-derived prevalence ratios.

Results: Among 3457 participants, 616 were obese (BMI ≥ 30 kg/m²), of which 161 (26%) were healthy obese. Obese adults were less physically active than normal-weight adults, regardless of metabolic health status or method of physical activity assessment. Healthy obese adults showed higher total physical activity than unhealthy obese adults only when assessed by accelerometer ($p<0.01$). Healthy obese adults were less likely to meet recommendations for moderate-to-vigorous physical activity than healthy normal-weight adults using accelerometer (Prevalence ratio=0.59, 95% confidence interval=0.43, 0.79), but were not more likely to meet these recommendations than unhealthy obese adults (PR=1.26, 95% CI=0.89, 1.80).

Conclusions: Higher total physical activity among healthy versus unhealthy obese adults is only evident when measured objectively using a wrist-worn accelerometer. Physical activity likely has a greater role in promoting health among obese populations than previously thought, and may confer substantial reductions in disease burden.

P3C.183

Comparison of Active style Pro HJA-350IT, ActiGragh™GT3X+ and activPAL3c in assessing sedentary behavior

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Active style Pro HJA-350IT (ASP) is a relatively new accelerometer which has high validity for estimating low intensity physical activity including sedentary behavior. There is limited research comparing the ASP's output to other accelerometers used in the large number of previous studies to assess sedentary behavior. It is of interest to know whether the different accelerometers give similar information about volume and patterns of sedentary behavior. The purpose of the present study was to compare the outputs of ASP, ActiGragh™GT3X+ (GT3X+), and activPAL3c™ (AP) in assessing sedentary behavior under free-living conditions.

Methods: Thirty four healthy workers (21 males and 13 females, 41.1 ± 13.0 years old) wore ASP, GT3X+, and AP simultaneously more than 10 hours during waking time on a work day and a non-work day. Sedentary behavior was defined <100 counts/min in GT3X+, ≤1.5 metabolic equivalents/min in ASP and code of sitting/lying 1 or more minutes in AP. The difference and agreement in outputs of total sedentary time were analyzed by ANOVA, intra class correlation coefficients (ICC 2.1) and Bland-Altman plots. The outputs of AP were used as criterion.

Results: Total sitting time on work day and non-work day measured by AP were 455.5±130.0 min and 543.5±163.3 min, respectively. Comparing outputs on work day, GT3X+ overestimated 46.5 min (95%CI=18.4, 74.7) but ASP underestimated 30.4 min (95%CI=-56.1, -4.8). On non-work day, ASP and GT3X+ showed no significant differences compared with AP but GT3X+ measured 35.6 min (95%CI=14.3, 57.0) longer than ASP. The ICC between ASP and AP was higher than between GT3X+ and AP on both days (work day: 0.889 vs. 0.837; non-work day: 0.926 vs. 0.921). Bland-Altman Plots indicated proportional bias between GT3X+ and AP on work day ($r=-.362$, $p=.039$).

Conclusions: The present study demonstrates that GT3X+ overestimates sitting time but ASP underestimates against AP. These tendencies, especially in GT3X+, are more obvious when standing time is relatively long. ASP is superior to GT3X+ in assessing total sedentary time probably because the ability of ASP to measure low intensity physical activity is high.

P3C.184

Tracking major dietary patterns from mid-adolescence into young adulthood.

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SIG: Yes, Policies and environments

Awards:

Purpose: Diet quality typically deteriorates in adolescence, when young people gain greater independence and tend to consume more 'junk' foods. Whether poor adolescent dietary patterns track into adulthood however, is unclear, yet this evidence is important for strengthening public health efforts to improve dietary intakes in young people. This study investigated two major dietary patterns in midadolescence and their tracking into young adulthood.

Methods: Data were sourced from 919 adolescents from the Western Australian Pregnancy (Raine) Cohort Study who completed dietary assessments at 14, 17 and 20 years of age. Two major dietary patterns were identified using principal components analysis. At each age, a 'Healthy' dietary pattern was characterised by high intakes of fruit, vegetables, fish and wholegrains; a 'Western' dietary pattern consisted of high intakes of takeaway foods, soft drinks, refined grains and processed foods. Multiple logistic regression models were applied to estimate the odds of high dietary pattern z-scores after adjusting for gender, maternal education and family income.

Results: Respondents having the highest 'Healthy' pattern z-scores (top tertile) at 14 years were 9.2 times more likely (95% CI: 5.9, 14.4) to have the highest 'Healthy' pattern scores at 17 years, compared to those with the lowest scores (bottom tertile); and were 4.3 times more likely (95% CI: 3.0, 6.3) to have the highest 'Healthy' pattern scores at 20 years. Those with the highest 'Western' pattern scores at 14 years were 5.2 times more likely (95% CI: 3.3, 8.0) to have the highest 'Western' scores at 17 years; and 1.7 times more likely (95% CI: 1.2, 2.5) to have the highest 'Western' pattern scores at 20 years. Tracking was stronger among boys between 14 and 17 years. Maternal education and family income were important predictors of dietary pattern scores.

Conclusions: Dietary patterns, particularly a 'Healthy' dietary pattern, track strongly from midadolescence and into young adulthood, highlighting adolescence as a critical period for establishing long term dietary habits.

P3C.185

Delivering physical activity interventions in a school setting: lessons learnt from the Active7 RCT

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objectives: To share practical knowledge gained from the Active7 RCT conducted in secondary schools. Future interventions can benefit from an awareness of the issues identified, which may aid recruitment of participants, intervention implementation, and data provision in future school-based research.

Methods: A two arm cluster randomized controlled trial was conducted in 18 secondary schools throughout the wider-Bristol area. Nine randomly selected schools received a 40 session after-school dance intervention aimed at increasing physical activity in Year 7 girls. Up to 33 girls were recruited in each school. Height and weight, psychosocial, EQ-5D-Y and accelerometer data were gathered from all participants (n=571) at three time points.

Results: The study exceeded school and participant recruitment targets (with reserves recruited for both). The intervention was successfully delivered and we achieved high levels of data provision for all measures at each time-point. Three valid days of accelerometry data were collected from 93.2% of participants over the three time-points. All participants provided full EQ-5D-Y and psychosocial data, and all but one child provided height and weight data at all three time points.

Taster sessions helped to recruit participants. Recruitment of reserve schools was necessary and reduced the burden caused by insufficient pupil sign-up. Failure of schools to abide by their own intervention scheduling (time, day and location of sessions) adversely affected attendance. Good ongoing interpersonal relations between study and school staff were vital for arranging data collection and the return of accelerometers.

Conclusions: High rates of recruitment, participant data collection, and intervention dose are achievable if researchers are sensitive to the needs and context in which schools operate. The success of school-based studies is largely contingent on a good understanding of the school setting and an engaged school contact.

The findings provide useful empirical information that can improve the process by which researchers conduct research and deliver interventions in schools.

P3C.186

Physical activity research with ethnic minority groups in the UK; a scoping review

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Important health inequalities exist in the UK. Some ethnic minority groups are at higher risk of developing major diseases such as type II diabetes. Lifestyle factors such as physical activity (PA) are theorised to contribute to this. The aim of this scoping review is to map PA related research that has been conducted with ethnic minority groups in the UK.

Methods: A 5-stage framework for conducting a scoping review, first proposed by Arksey and O'Malley (2005) and enhanced by Levac et al. (2010), was adopted in this study. A comprehensive search was conducted in 10 electronic databases and five guideline websites. Searches were limited to publications after 2004, following the publication of the UK Chief Medical Officer's landmark report on the impact of physical activity on health, until September 2014. Studies were restricted to those of English language. To ensure breadth and depth there were no restrictions by age or study type. The inclusion criteria for study selection was: i) UK-based; ii) involving one or more of the ethnic minority groups specified; and iii) PA included as an outcome, risk factor, confounder, mediator or topic being discussed. Data extraction variables included study location, study type, population, and methodological characteristics. Studies were categorized into main research areas using Sallis and Owens' five phase behavioural epidemiological framework (Sallis and Owen, 2002).

Results: Database and guideline website searching produced 3,253 initial records. Following removal of duplicates, 1,839 articles underwent title and abstract screening with full-text screening conducted on 173 articles. Data extraction took place on 153 articles. The results of this review highlight the limited number of intervention studies that have been conducted in ethnic minority groups in the UK, despite these groups typically displaying lower levels of activity. Physical activity is commonly discussed, or embedded within, a wider focus on disease prevention or management rather than studies having a primary aim on the promotion of PA.

Conclusions: Despite considerable research activity in this area since 2004, there remains significant gaps that need to be addressed, particularly in relation to strengthening the evidence base for effective interventions in these groups.

P3C.187

Perceptions about Having a Healthy Pregnancy and Gestational Weight Gain

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SIG: No, this does not fit in any of the special interest groups

Awards:

Limiting excessive weight gain during pregnancy may help to improve pregnancy outcomes and reduce long-term obesity risk among mothers. Unfortunately, behavioral interventions to promote healthy gestational weight gain have been largely unsuccessful.

Objective: To determine pregnant women's views on what a healthy pregnancy entails and understand their knowledge/concerns about gestational weight gain as well as information sources for these topics in order to inform behavioral intervention development.

Methods: Currently pregnant English-speaking women > 18 yrs old were recruited from a prenatal care clinic to participate in individual semi-structured interviews. A trained moderator used an interview guide to ask questions about the meaning of "Healthy Pregnancy" and gestational weight gain, with probes to determine informational sources. Interviews were recorded, transcribed verbatim, loaded into NVivo 9, and analyzed using an inductive thematic framework.

Results: A total of 16 interviews were conducted, and thus far, six have been analyzed. When asked about the meaning of "Healthy Pregnancy", only one woman mentioned healthy weight gain. The discussion primarily focused on maternal behaviors with primary themes of Diet Changes, Cravings and Restrictions and Exercise Confusion. Baby Health/Pregnancy Complications were also mentioned by a few. In terms of gestational weight gain, most women expressed that their health care providers gave non-specific advice and did not seem overly concerned, which translated into the women themselves not being very concerned about gaining too much unless they had previous issues with their weight. Information sources in order of number of mentions were: app/website, health care provider, web search, family/friends and books. Women mostly trusted what they read on the web/app if they saw the information on multiple sites, it matched their own personal experience/beliefs and/or the app was highly rated.

Conclusions: Most pregnant women in this study did not connect gestational weight gain with the concept of having a healthy pregnancy. Their level of concern about weight gain appeared to relate to their health care providers' attitude, yet they more often used websites and apps for information about weight gain and pregnancy.

P3C.188

A randomised controlled trial of an audit and feedback intervention to improve primary schools implementation of healthy canteen policies.

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SIG: Yes, Policies and environments

Awards:

Objective: Despite mandatory policies in Australia requiring government schools provide healthier foods and restrict sales of less healthy foods, few school canteens comply with such policies. Audit and feedback represents a promising way of providing implementation support to schools. This study examines the effectiveness of a multi-component audit and feedback intervention in increasing Australian primary school canteen's implementation of mandatory state-wide healthy canteen policy (Fresh Tastes@ School).

Methods: A randomised controlled trial was undertaken with 72 schools located in rural/remote locations within a region in one Australian state (New South Wales). Schools who reported having a canteen and were not compliant with the policy were eligible to participate. Schools in the intervention arm (n=36) received up to four canteen menu audits over 12 months, each followed by two modes of feedback (a written report and telephone support call). To assess changes in compliance to the healthy canteen policy, standardised menu reviews were undertaken at 12 - 14 months follow-up by dietitians blinded to group allocation. The primary outcome was the proportion of schools providing more than 50% of 'green' foods (foods that are nutrient rich and contain only small amounts of saturated fat, salt, added sugar) and not providing any 'red' foods (foods high in energy, low in nutrients and high in saturated fat, salt, added sugar) on their menu, consistent with policy requirements.

Results: Preliminary analyses indicates that 50% of schools in the intervention group provided primarily (>50%) green foods and 36% did not have any 'red' foods on their menu. For the control group, 30% provided primarily green foods and 10% did not have any red foods on their menu. Results from the logistic regression controlling for baseline data will be presented.

Conclusions: Initial findings suggest that a telephone-based audit and feedback intervention may be effective in providing support to primary schools located in rural/remote areas with implementing a healthy canteen policy.

P3C.189

Assessing the readiness of religious leaders to engage in obesity prevention interventions in adolescents in urban South Africa.

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SIG: Yes, Policies and environments

Awards:

Objective: South Africa is undergoing epidemiological and nutrition transitions with associated increases in the incidence of obesity and diet-related chronic diseases. Increasingly, religious institutions such as churches are recognised as being popular settings for implementing health promotion programmes. This research explored the potential for churches to be used as community-based organisations for obesity prevention interventions in adolescents by assessing the readiness of religious leaders to engage in such interventions.

Methods: Interviews with religious leaders were conducted in the area of Johannesburg and Soweto. The Community Readiness Model (CRM) survey was chosen to determine the stage of readiness of this particular community regarding obesity. Six different dimensions were assessed in the CRM (community efforts and knowledge of efforts, leadership, community climate, knowledge of the issue, resources). The surveys were scored according to the CRM protocol. The survey was used in combination with focus group discussions (FGDs). Content analysis of the qualitative data was used to examine specific themes that emerged from the FGDs.

Results: The mean readiness score for obesity was 2.67 which relates to the second out of nine stages of the CRM and equates with the "denial/resistance stage". This stage is reached when "at least some community members recognise that obesity is a concern, but there is little recognition that it might be occurring locally". The readiness scores for resources were the highest of all the dimensions (3.75), followed by knowledge of the issue (3.18). The lowest score was seen for community knowledge of efforts (1.88), followed by community climate (2.16). FGDs provided a wide range of opinions which allowed the interpretation of the CRM scores.

Conclusions: Religious leaders have some knowledge about the obesity issue and some of the resources are available to support obesity prevention-related initiatives. However, the low community knowledge of efforts and community climate highlight the need to increase awareness of the issue and develop initiatives on obesity prevention.

P3C.190

Opportunities for lifestyle change in cancer screening, testing and treatment settings: analysis of the needs of men undergoing testing for cancer of the prostate

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: Cancer of the prostate (CaP) is the most common cancer among men. Patients tested for CaP have relevant risk factors for lifestyle-related conditions^{1,2}, often limited access to behavioural change advice and support³ and lifestyle change improves outcomes^{1,4,5}. Recently the World Cancer Research fund has found strong evidence for increased risk for developing advanced CaP from overweight/obesity¹. This study assessed lifestyle behaviours of men being tested for CaP. To our knowledge this is the first in-clinic assessment of the specific needs of this group for lifestyle change support.

Methods: All men undergoing a Transrectal ultrasound (TRUS) at a Urology Department in one NHS board were surveyed. For a period of 13 weeks self-reported information about patients' lifestyle behaviours was collected using a questionnaire developed for this setting. Items queried smoking, alcohol consumption, physical activity, diet, height/weight (BMI was calculated from this information), caffeine intake, perceptions of life being worthwhile and stress management behaviours.

Results/findings: Sixty patients completed surveys (average age=66 years old, average SIMD quintile=3). Of these=44 screened positively for CaP and n=16 negatively. Median BMI = 28.1 kg/m² (range 22.1-41.6), only 16% (9/56) were of normal weight range, 55% were overweight (31/56) and 29% obese (16/56). Lifestyle behaviors contributing to overweight/obesity were: *physical activity* - men averaged 30 minutes of moderate activity 3 days per week (range 0-7) and 2.9 days of muscle strengthening activity (range 0-7); *diet* - average of 2 fruit and 2 vegetable servings per day (range 0-5, 0-6, respectively) and *alcohol* - 79% (46/58) of men drank at least occasionally (36% 20/56 'most weeks'); average units consumed among this group was 20 units (range 4.5 - 40 per week) with most consumed on one day 6.8 (range 2 - 16 units).

Conclusions: This study has identified that testing for CaP offers potential for the teachable moment for lifestyle change among men. Among patients being tested for CaP in a routine clinic, a majority are overweight/obese and many are insufficiently active, do not eat recommended fruit/vegetable amounts, and many drink regularly with daily consumption over recommended limits. This demonstrates a need for lifestyle change support in this population.

P3C.191

Isotemporal substitution analysis for activPAL measured sitting/lying, standing and stepping and markers of cardiometabolic health

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University of Leicester, Leicester, UK

SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: To quantify associations between activPAL measured sitting/lying time and markers of cardio-metabolic health by considering re-allocation into standing or stepping time. To our knowledge this is the first study to use the activPAL device to examine such associations.

Methods: Participants (aged 30-75 years) for this cross-sectional study were those who were identified as being at high risk of impaired glucose regulation (IGR) or type 2 diabetes (T2DM) from General Practice databases (Leicestershire, UK). Lying/sitting, standing and stepping time were assessed using the activPAL3, which was worn continuously 24 hours/day for 7 days. Fasting and 2-h plasma glucose (measured using an oral glucose tolerance test) and insulin, waist circumference, body fat percentage, triglycerides, total cholesterol and high-density-lipoprotein (HDL) cholesterol were measured. Insulin sensitivity was calculated by HOMA-IS and Matsuda_{ISI}. Isotemporal substitution regression models were used to model the difference in levels of assessed variables when substituting 60 minutes of sitting/lying time for standing or stepping time.

Results: 435 participants (mean age 66.8 ± 7.4 years; 62.1% male; 89.4% White European) were included. After adjustment for age, sex, ethnicity, social deprivation, smoking status, family history of T2DM, medication status and waking wear hours, re-allocating 60 minutes of sitting/lying time for standing was inversely associated with waist circumference (-3% difference, $p < 0.001$), BMI (-4% difference, $p = 0.001$), and body fat percentage (-5% difference, 0.003), and positively associated with HDL cholesterol (4% difference, $p = 0.026$). No associations were seen for any other markers of health ($p > 0.05$). Re-allocating 60 minutes of sitting/lying time for stepping was inversely associated with waist circumference (-9% difference, $p < 0.001$), BMI (-10% difference, $p < 0.001$), body fat percentage (-13% difference, $p < 0.001$), triglycerides (-21% difference, $p = 0.010$), 2hr glucose (-20% difference, $p < 0.001$), 2hr insulin (-54% difference, $p < 0.001$), and positively associated with Matsuda_{ISI} (16% difference, $p = 0.001$).

Conclusions: Re-allocating 60 minutes of sitting/lying time for standing was associated with measures of adiposity and HDL-cholesterol. However, re-allocating 60 minutes of sitting/lying time for ambulatory activity was associated with a broader range of cardiometabolic health markers, particularly post-challenge measures of insulin sensitivity.

P3C.192

A Grounded Theory study on experiences of empowerment: Perspectives from clients attending the Lifestyle Service

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective:

Health inequalities are a major concern in the UK and in the city of Stoke-on-Trent, which presents a health profile that compares poorly with national figures. The Ottawa Charter for Health Promotion committed to tackle inequities in health and defined Health Promotion as '*the process of enabling people to increase control over, and to improve, their health*', putting the concept of empowerment at the heart of health promotion.

The Lifestyle Service (LS) is one of the commissioned health promotion programmes to tackle the Stoke-on-Trent health challenge. The LS is based on the Health Trainer model, underpinned by health psychology theories such as Control Theory, the Health Action Process Approach and Social Cognitive Theory. Clients are typically referred from primary care to see a Lifestyle Coach, who uses motivational interviewing to help individuals identify aspects of their own lifestyle they would like to modify. Individual behaviour change interventions have been investigated from several perspectives, yet, how empowerment is experienced by clients is unknown. This qualitative longitudinal study aims to explore the role of the LS and if/how clients experience empowerment, and change their lifestyle over the period of one year.

Method:

Charmaz's constructivist approach to grounded theory has been employed to explore the process of empowerment. This paper will present baseline and one-year follow up findings from in-depth and semi-structured interviews with 23 participants (BMI ≥ 30). Follow-up interviews are currently taking place (to be completed May 2015). Interviews have been recorded, transcribed verbatim and coded using constant comparative analyses.

Results:

Analysis of baseline data has generated a model that explains how clients rely on external support to lose weight. A common expectation was to gain access to a professional who would regularly monitor the client's weight, as being measured by others kept them focused. Most clients perceived the LS as a 'short-term product' that should 'fix the problem' for them. Preliminary analysis of follow up interviews is generating a second model that explains how engaged clients internalise the process of losing weight, taking control over own health. Complete baseline and follow up data will be presented, with descriptive statistics on typical population profiles.

P3C.193

Overweight and obesity amongst brazilian and portuguese school children

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Childhood obesity is one of the most serious public health challenges of the 21st century. The problem is global and is steadily affecting many low- and middle-income countries. The prevalence has increased at an alarming rate. Thus, the aim of the study was to compare school children body mass index (BMI) residents in Matosinhos, Portugal, and in Uberaba, Brazil, registered in 1st Cycle Basic Education and Elementary school, respectively.

Methods:

A school-based cross-sectional study was conducted at two cities in Brazil (n=155) and Portugal (n=163), averaged 9.63 ± 0.49 years-old. Overweight and obesity classification were given from BMI/age and sex, according recommendation by World Health Organization (2007). Multiple Linear Regression was used to determine factors associated between BMI and country, with 5% significance level.

Results/findings:

The normal weight, overweight and obesity prevalence were 71.0%, 14.8% and 14.2% in the Brazilian sample and 62.0%, 25.2% and 12.9% in Portuguese, respectively. Multiple linear regression, adjusted for age and gender, has found BMI-values significantly influenced by origin country. Being girl was significantly (BMI: B = 1,55; p ≤ 0,05) associated with lower BMI-values in the Brazilian youth but not for boys (BMI: B = 0,81; p > 0,05).

Conclusions:

These cross-cultural results suggest that the country may have an influence on BMI in school children, especially girls. The difference between countries should be considered as a factor risk for overweight and obesity childhood. More research is needed to confirm these data.

P3C.194

Cardiorespiratory Fitness and preschooler's Obesity Status

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Cardiorespiratory fitness is a measure of body functions, and its assessment should play an important role in the activities associated with the promotion of physical activity as an important component of a healthy lifestyle. The benefits of promoting physical fitness (PF) in counteracting the high prevalence of childhood obesity has become increasingly important in the past decade. The aim of this study was to examine the association between the shuttle run (SR) as a measure cardiorespiratory and the risk of being overweight and obese in preschool-aged children.

Methods:

The sample comprised of 341 children aged 3-6 years, recruited from kindergartens located in the metropolitan area of Porto, Portugal. Preschooler's body mass index was classified according to World Health Organization (WHO) categorized into two levels, normal and overweight/obesity. The SR (10x5m) was classified in second. We performed multiple linear regressions.

Results/findings:

The prevalence of normal and overweight/obesity was 90.7% and 9.3 in girls and 95.5 and 4.5% in boys. We noticed that in girl there is a significant relationship between obesity and the cardiorespiratory test (SR), adjusted to the age of the children. Thus the association with shuttle run was B = 37.77; p ≤ 0.05. For boys there isn't a significant relationship between obesity and the cardiorespiratory test.

Conclusions:

There is a significant association between one of the components cardiorespiratory fitness (SR) in different categories of the WHO among girls preschool children. The obese girls children spent more time and had greater difficulty in realizing the motor test. Further, longitudinal studies are needed to confirm this data.

P3C.195

Associations between sedentary behaviour, physical activity and presenteeism in UK workers

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: The cost of unproductive and absent staff is well documented, with presenteeism incurring greater costs than absenteeism. Physical and psychosocial health outcomes are associated with presenteeism, physical activity, and sedentary behaviour. Little is known however of the relationship between presenteeism, physical activity and sedentary behaviour. This study examined associations between sedentary behaviour, physical activity and presenteeism in UK workers, across work and non-workdays.

Methods: 67 participants met inclusion criteria for data analyses. Presenteeism was assessed using the Work Limitations Questionnaire (WLQ). Physical activity and sedentary behaviour were assessed using ActiGraph wGT3X-BT accelerometers. Criteria were set for inclusion in workday (≥ 10 hours wear time on ≥ 3 workdays), non-workday (≥ 10 hours; ≥ 1 non-workday) and whole week (≥ 10 hours; ≥ 3 workdays + ≥ 1 non-workday) analyses. Binary logistic regression examined associations between sedentary behaviour, physical activity and presenteeism.

Results: On work and non-workdays, 57% and 53% of time was spent sedentary, 35% and 41% of time was spent in light physical activity, and, 7% and 6% of time was spent in moderate-to-vigorous physical activity, respectively. The mean WLQ productivity loss score was $1.9 \pm 2.7\%$ (range 0.0-12.0%) with 87% of participants categorized as not impaired ($< 5\%$) and 13% impaired ($\geq 5\%$). No significant associations were found for time spent sedentary, and in any physical activity intensity, for workday, non-workday or whole week data, and presenteeism.

Conclusions: Levels of presenteeism were low in this sample of UK workers, with minimal variation in WLQ scores. Sedentary time and physical activity were not associated with presenteeism. Research in workers with a greater range of presenteeism is warranted to confirm these associations.

P3C.196

Physical activity and before and after breast cancer diagnosis and survival - The Norwegian Women and Cancer Study

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SIG: Yes, Cancer Prevention and Management

Awards:

Purpose: The main aim of this study was to investigate pre- and post-diagnostic physical activity (PA) levels, as well as changes in these PA levels, and their association with all-cause mortality and breast cancer-specific mortality in women with breast cancer. Our study will add to the knowledge whether a modifiable behavior such as PA after breast cancer diagnosis may improve survival.

Methods: We included 1,327 women with breast cancer from the population-based Norwegian Women and Cancer Study, which enrolled women in the period 1991-2003. Breast cancer cases were identified through record linkage to the Cancer Registry of Norway; date and cause of death were obtained from the National Register for Causes of Death through 31 December 2012. Self-reported pre- and post-diagnostic PA levels were assessed, and Cox proportional hazard regression and spline regression were used to evaluate the associations.

Results: Pre-diagnostic PA levels were not associated with all-cause or breast cancer-specific mortality. Post-diagnostic PA levels were associated with a significant trend ($P < 0.001$) of decreased all-cause and breast cancer-specific mortality, which was stronger among older women (aged 50-74 years) and did not change with body mass index (BMI). All-cause mortality (hazard ratio [HR]=0.64, 95% confidence interval [CI] 0.47-0.85) and breast cancer-specific mortality (HR=0.57, 95% CI 0.41-0.80) were reduced among women who increased their post-diagnostic PA level to active and those who maintained an active PA level both pre- and post-diagnosis. This reduction was stronger in women who also increased their post-diagnostic BMI.

Conclusion: Overall, we observed a dose-response trend, with an inverse association between increasing post-diagnostic PA level to active and maintaining an active PA level pre- and post-diagnosis and all-cause and breast cancer-specific mortality. Our results are very promising for women and health care professionals who use PA as an approach to primary cancer treatment.

P3C.197

eEatnDrink: A smartphone application to measure emotional and environmental factors that drive adolescents to eat

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SIG: Yes, e- & mHealth

Awards:

Purpose: Researchers have developed smartphone apps to measure what individuals eat. We designed eEatnDrink, an app to measure *why* individuals eat, and piloted it with a sample of six adolescents.

Methods: Participants recruited from a primary care clinic at Boston Children's Hospital were provided an iPhone with the eEatnDrink app for a minimum five-day sampling period. eEatnDrink utilized a combination of random and event-based momentary assessments to capture eating motivations and events throughout the day. Participants received up to six signals per day, three meal reminders and three prompts at random times, to complete reports on mood, hunger, environmental cues, and social interactions. Participants were also asked to video record the locations in which meals were eaten and photos of meals (before and after eating).

Results: All six participants (age 12-17 years; 50% female) completed the pilot test of eEatnDrink. Adherence was good: 142 surveys were completed, 153 videos recorded, and 181 pictures logged over 48 total sampling days. Data during mealtimes demonstrated that participants were likely to eat in the absence of hunger (44.3% of reports were "not at all" hungry at mealtime). Over 21% of meals occurred within views of images of food, and 29.5% occurred when participants could smell food. The majority of meals were eaten with family, although 29.4% of meals were eaten alone. Participants were more likely to report being hungry (78.4% reported being "a little" hungry or greater) on random assessments than on mealtime assessments, while participants were more likely to report being "not at all" happy (39.3%) on mealtime assessments compared to random assessments (23.5%). Participants reported eating on 11.4% and watching TV on 31.1% of non-mealtime assessments.

Conclusions: The pilot test of eEatnDrink demonstrated the feasibility of a smartphone app to measure momentary mood, hunger, and environmental cues to eat both between and during mealtimes. While work is in progress to process digital images and videos to better understand diet, the eEatnDrink app shows promise in estimating the emotional and environmental factors that drive adolescents to eat.

P3C.198

Cultural and economic differences in television viewing in early childhood

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose:

Television viewing is one of the most common sedentary behaviours for pre-schoolers, with established adverse outcomes for children's cognitive and language development, and risk of cardio-metabolic disease. This study described TV viewing trajectories from age 5 to 40 months, based on repeated measures, and explored cultural and economic influences.

Methods:

A subsample of 1284 children from the Born in Bradford birth cohort was included in the study. Mother's reported their child's and their own TV and DVD viewing when their child was, on average, 6, 12, 18, 24 and 36 months old (EPIC Norfolk EPIQ-2 questionnaire). Trajectories of children's TV viewing were estimated using multi-level modelling. Explanatory factors were added to the model including: mothers TV viewing, age, self-reported ethnicity (White British, Pakistani, other), country of birth (UK, Pakistan, other), and material deprivation.

Results:

The empty growth trajectory model found average child screen time was 1.38 hours/day, with 0.04 hours less or more for every month below or above average child age of 19.9 months. When explanatory variables and interactions were added, model fit improved ($p < 0.001$). The largest substantive effect on child screen time was mother's screen time, every additional hour of mother's screen increased child screen time by 0.21 hours. On average children whose mother's ethnicity was Pakistani had 0.23 hours more TV viewing/day compared to those with White British mothers. Children with mothers born in Pakistan had 0.19 hours more TV viewing/day than children whose mothers were born in the UK. When interactions with age were included in the model, all children increased TV viewing with age; increases were larger for children whose mothers were of Pakistani ethnicity or born in Pakistan. Material deprivation had the largest effect on children with White British mothers, increasing average screen time by 0.18 hours/day, and decreasing average screen time of children with Pakistani mothers by an average of 0.17 hours/day.

Conclusions:

The largest substantive explanatory factor on children's TV viewing was mother's TV viewing, thus interventions to reduce children's TV viewing should also target mother's TV viewing. Furthermore, interventions should be tailored for different cultural and economic groups.

P3C.199

Do 'healthier' students exhibit higher academic achievement and school connectedness?

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Obesity and its related health behaviours in youth pose significant risks to physical and emotional health, and may negatively impact youths' experience in the school setting. The purpose of this study was to examine the relationship between selected obesity-related health behaviours and education outcomes among Ontario and Alberta high school students. We hypothesize that an increase in body mass index (BMI), poor diet, low levels of physical activity, and high screen time will be associated with poorer academic achievement, lower school attendance, and lower school connectedness.

Methods: COMPASS is a 4-year longitudinal study that investigates youth health behaviours and the impact of the school environment (programs, policies, and resources) on health behaviours and outcomes among youth in grades 9-12 in Ontario and Alberta, Canada. BMI, its behavioural correlates, and education outcomes of >30,000 students were measured by self-report (year 2 data). The relative contribution of BMI, dietary behaviours, physical activity, and sedentary behaviours on education outcomes were examined using regression analyses.

Results: Overall, 20% of female and 32% of male students were overweight or obese. Higher BMI, lower physical activity levels, and higher screen time were associated with poorer academic achievement, lower school attendance, and poorer school connectedness.

Conclusions: Results suggest the need for a comprehensive school health approach to promote healthy behaviours. School action and improvement plans should target multiple modifiable behaviours, to both improve student obesity-related health behaviours and education outcomes. Long-term follow-up/longitudinal studies may clarify the relationship between weight status, obesity-related behaviours, and education outcomes

P3C.200

Effectiveness of self-management plans on quality of life and healthcare utilization in people with COPD: meta-analysis with meta-regression

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Self-management (SM) plans are recommended for individuals with Chronic Obstructive Pulmonary Disease (COPD) to help recognize and treat exacerbations of their condition. Promoting increased physical activity is a key component of COPD SM plans. Although SM planning is shown to be effective, there is wide variability in effect, and it is unclear what factors account for the heterogeneity. We conducted a review of reviews to examine the effectiveness of SM interventions in adults with COPD on perceived quality of life (measured by Saint George Respiratory Questionnaire (SGRQ)).

Methods: Relevant randomized controlled trials were identified via 5 existing systematic reviews and independent data extraction was conducted. Interventions delivered in any health setting that aimed to improve SM in patients with COPD were included. Univariate meta-regression was used to explore the mediating effect of number of emergency department (ED) visits during the study period on SGRQ scores. Sub-group moderator analyses were used to explore whether a difference in effectiveness on SGRQ scores was observed in trials where over and under 50% of participants had severe COPD (FEV1 predicted score <50%) (FEV1 predicted score >50%).

Results: SM interventions improved total SGRQ scores over usual care (SMD=0.28; 95% CI=0.17 to 0.40; k=22; p<0.001). Disease severity at baseline did not moderate intervention effectiveness (Q=0.05; k=22; p=0.82). SM interventions had no significant effect on ED visits compared to those who received usual care (SMD=0.16; 95% CI=-0.03 to 0.34; k=13; p=0.09). Difference in the number of ED visits between groups during the study period had no mediating effect of the on SGRQ scores (beta = 0.32, 95%CI: -0.02 to 0.66, k=13; Q = 3.45, df=1, p=0.07).

Conclusions: SM interventions can be effective at improving quality of life in individuals with COPD. SM interventions appear equally effective irrespective of severity of COPD symptoms. Healthcare utilization was shown not to effect quality of life scores. Coding of behavior change techniques (BCTs) is ongoing to identify whether BCTs specifically targeting physical activity moderate these associations.

P3C.201

Barriers to physical activity in patients with chronic asthma

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

There is a large body of evidence that shows positive associations between asthma and physical activity (PA) among adults. Avallone *et al*'s. (2013) review paper identified that only one study has examined barriers and attitudes to PA among adult asthma patients, and highlighted the need for such studies in order to enable targeted intervention programmes to address barriers and increase motivation. The primary purpose of this study was therefore to explore barriers to PA in patients with chronic asthma within the unique setting of an innovative 'rapid assessment' community based asthma clinic.

Methods:

65 participants (M = 18, F = 47; M age = 52.65 ± 15.36 yrs) from 4 GP surgeries in the Wessex region of England attended 4 community based rapid asthma assessment clinics. These clinics are part of an NHS initiative; Modern Innovative Solutions to Improve Outcomes in Asthma (MISSION). Participants identified as having poorly controlled asthma from GP notes were invited to attend the clinics which took place at the weekends in their GP surgery. In addition to a number of clinical measures and advice about self-management, participants had a 10 minute exercise consultation. Once levels of current PA had been established, participants were asked the open ended question "What are the main factors that might prevent you from regularly physically active in the next 6 months?" Responses were recorded and then analysed using thematic analysis.

Results/findings:

The primary barrier to exercise was condition specific, with concerns regarding onset of exacerbations, environmental conditions and risk of infections being frequently cited. The existence of co morbidities was also a primary barrier. A recurring reference to musculoskeletal issues was identified, primarily relating to back pain, general joint/muscle pain, arthritis and specific injuries. Barriers that are often cited in healthy populations were also evident, including cost, psychological barriers and time.

Conclusions:

The findings of this study provide an insight in to the barriers that influence PA levels in adults with asthma, and these can therefore be drawn upon in order to enable targeted intervention programmes to address those barriers and increase participation in PA where appropriate.

P3C.202

Feasibility of lifestyle counseling in overweight male professional drivers

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Professional drivers are a challenging group for health promotion. We conducted a randomized, controlled trial in overweight drivers aiming at 10% weight loss by counseling on diet, physical activity (PA) and sleep. As a result, moderate reductions in weight and cardiometabolic risk factors were observed. We assess here the feasibility of the counseling procedure to evaluate its transferability to practice.

Methods: Male truck and bus drivers with waist circumference >100 cm were randomized into a lifestyle counseling (LIFE, N=55) and a reference (REF, N=58) group. LIFE participated monthly in individual counseling (6 face-to-face, 7 phone contacts) for 12 months. Feasibility outcomes included 1) participation rate in scheduled counseling sessions, 2) realization of the intended counseling contacts and contents, 3) preferences of monthly dietary and PA goals and 4) participant-perceived facilitators and barriers for reaching the goals. Feasibility was assessed with records kept by the counselors at each contact.

Results: Participation rate among LIFE completers (N=47) in counseling sessions was 98%. 71% of contacts were carried out within one week of the schedule and 91% in the intended order of the counseling procedure. Three most frequent dietary goals dealt with meal frequency (195 reports), plate model (134) and use of fruit and vegetables (65). The most popular PA goals related to walking (208) and biking (33). Typical facilitators for reaching the goals were support from significant others (10 reports), ailment prevention (10), good quality roadside resting places (5), and good opportunities to perform PA (5). The most common barriers were working schedules (44), ailments (21), and own or family attitudes and habits (19).

Conclusions: Participation in the offered counselling sessions was high and the procedure involving both face-to-face and telephone contacts seemed appropriate to this target group, which is hard to reach. Perceived facilitators and barriers for reaching dietary and PA goals were as expected, with working schedules as the most common barrier. The study protocol cannot be straightly implemented into occupational health care. Instead a less intensive structured health counseling program is needed.

P3C.204

A mixed methods evaluation of the eaTracker My Goals feature

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SIG: Yes, e- & mHealth

Awards:

Purpose: In 2011, Dietitians of Canada added a nutrition and physical activity behaviour goal setting and tracking tool ("My Goals") to their established self-monitoring website (eaTracker®). With "My Goals," users can set "ready-made" SMART goals (RMG(s)) or "write your own" goals (WYOG(s)), and track progress. In Dec/2012, EatRight Ontario (ERO) added optional supports for Ontario "My Goals" users (motivational messages, toll-free call or email dietitian goal consultation). These types of etools have been understudied; therefore, the purpose of this research was to evaluate "My Goals" and ERO supports using a mixed methods approach.

Methods: All goal entries in eaTracker's anonymous database set by Ontario and Alberta adult users from Dec/2012-Apr/2014 (n=16,511 entries set by n=8,067 users) were analyzed using descriptive statistics; WYOGs were qualitatively coded. Furthermore, adult "My Goals" users (n=23) recruited via eaTracker®, and ERO dietitians (n=5) completed a one-on-one semi-structured interview (in-person, phone or online). Interviews were audio recorded, transcribed, coded and organized into themes using NVIVO v10. Merriam's Basic Interpretive Qualitative Approach guided this study portion.

Results/Findings: "My Goals" users were primarily female (83%), 35-70y (60%), with a BMI≥25 (64%); more goals were RMGs (75%) vs. WYOGs (25%). Of total WYOGs, ~40% addressed dietary behaviour change, ~1/6 of which were unspecific general healthy eating goals (e.g., eat healthier); ~19% of WYOGs addressed physical activity, ~50% of which were unspecific and general (e.g., exercise more). Several WYOG entries (~44%) only addressed distal outcomes (e.g., weight loss). Few goals (≤10%) were tracked. Interviewed participants were enthusiastic about the "My Goals" concept, however, usability concerns were reported (e.g., tracking goals as achieved or in progress was not helpful and linking goal progress to nutrition and exercise self-monitoring data was desired). Dietitians reported concerns about poor WYOG quality. Although, 33% of all Ontario users accessed motivational messages, some interviewed users disliked emailed messages and/or desired more message personalization. Dietitian consultations about these goals were infrequent. Suggestions were provided to optimize future services.

Conclusions: This study highlights the feasibility and popularity of adding goal setting and tracking components to the eaTracker® tool. This evaluation can be used to direct future tools.

P3C.205

ESC Project: The influence of strangers in physical activity and sedentary behavior. A randomized controlled trial

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SIG: Yes, Policies and environments

Awards:**Purpose:**

A rising number of studies have been emerging from Deci and Ryan's Self-Determination Theory with interventions targeting health behavior change. Recent research shows that exercise motivation can be "contagious" and suggests that family, friends, peers and media figures can be used to make people more active and less sedentary. However, it seems that there is a lack of knowledge about social contagion through strangers. Hence, the main purpose of this study was to analyse the association between social contagion through strangers and Physical Activity (PA) and Sedentary Behavior (SB) levels.

Methods:

Data from the ESC (Exercise Socially Contagious) Project were used. ESC Project is a randomized controlled trial. In total, 74 adults (18-64 years), both genders, were allocated in two groups (37 participants each): intervention group (IG), which were exposed to strangers (staff members) talking about PA, ten people doing PA (prepared actors) and a PA video while they were walking into the college facilities; control group (CG), was only exposed to a video about healthy nutrition. Participants PA and SB were measured by accelerometers Actigraph (wGT3X) for seven consecutive days, before and after the intervention. Accelerometer data were processed with standardized procedures.

Results:

Changes scores of PA and SB showed that participants experienced greater increase in Light intensity PA performed in weekdays (t(70)=-2.81, p=.006, r=.32) and in the total of the week (t(70)=-2.24, p=.028, r=.26), between pre-test and post-test, when primed with PA. However, no differences were found between CG and IG in Moderate-to-Vigorous intensity PA (MVPA) (p>.05) and in all weekend SB or PA (p>.05). Finally, the IG participants had a larger SB decrease (CG: M=-16.83, SD=68.32 min; IG: M=-48.83, SD=75.70 min), a difference that was marginally significant (t(70)=1.88, p=.064, r=.22).

Conclusions:

The data indicate that the exposure to strangers doing and talking about PA was associated with a SB decrease in approximately 30 min in a week and a LPA increase in about 20 min in a week. Therefore, social contagion through strangers appears to promote behavior changes concerning PA and SB.

Keywords: ESC Project, Social Contagion, Behavior Change, Physical Activity, Sedentary Behavior

P3C.206

Ensuring Everybody Gets to Play: Exploring the Cultural Relevance of Physical Activity Programming for Aboriginal Peoples

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective: Aboriginal peoples benefit physically, mentally, emotionally, and spiritually from culturally relevant physical activity (PA) opportunities (Critchley et al., 2006; Iwasaki & Bartlett, 2006). Despite these benefits, training for PA providers about culturally relevant PA and PA barriers unique to Aboriginal communities is largely absent from PA interventions (Teufel-Shone et al., 2009). With limited information available about the development of culturally appropriate programming, this study aimed to explore changes in the implementation of cultural strategies following the Everybody Gets to Play Toolkit (EGTP) and Aboriginal Supplement workshop.

Methods: The EGTP and Aboriginal Supplement workshop aims to train PA and recreation providers to provide culturally relevant programming and to reduce barriers to participation in PA by Aboriginal peoples across Canada. Participants (n=110) completed a questionnaire at the two day workshop and again, at three month follow-up, that categorized cultural strategies as peripheral, evidential, linguistic, constituent-involving, and sociocultural based on a framework developed by Kreuter and colleagues (2003). Paired samples t-tests using SPSS 22 were used to determine if there were changes in the use of strategies across time.

Results: Of the five strategies outlined above, constituent-involving strategies (e.g., employing Aboriginal staff, providing Aboriginal training opportunities, and involving Aboriginal stakeholders from the community) were used most often at baseline and at three month follow-up, however this difference was not significant (p=.13). Evidential strategies were used least often at baseline, but increased at three month follow-up. However, this difference was also not significant (p=.40). Changing font size on written material, using interpreters, and using evidence specific to Aboriginal peoples were least likely to be used in developing PA programming at both time points.

Conclusions: Our findings that workshop participants did not significantly change the use of cultural strategies, especially constituent-involving, suggest that attendees may already be proficient in their understanding of Aboriginal culture when developing PA programs. While it was expected that underutilized strategies at baseline would be implemented following the EGTP workshop, it may be that other factors, such as organizational support, might be necessary for implementing effective culturally relevant PA programming for Aboriginal peoples.

P3C.207

Association between sedentary behavior and cardio-metabolic risk in Thai active older adults

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SIG: Yes, Socioeconomic inequalities

Awards:

Purpose: Sedentary behavior has been proposed as an independent cardio-metabolic risk factors and contribute to reduce the lifespan among the older adults. The aim of this study to examine the association between sedentary behavior and cardio-metabolic risk in Thai active older adults.

Methods: Cross-sectional analyses of older adults ≥ 60 years who Participants living in the 5 region of Thailand. A total of 378 participants were considered for data analysis (128 males and 250 females, Mean 66.6, S.D 5.3). Sedentary behaviors were assessed by using a set of open-end questionnaire of GPAQ₂ consisting TV viewing and leisure time sitting. The cardio-metabolic risk factors measured consisted of body mass index (BMI), waist circumference, fasting blood sugar, Cholesterol, High density lipoprotein cholesterol (HDL), Low density lipoprotein cholesterol (LDL) and Triglyceride. The relationships between sedentary behavior and cardio-metabolic risk factors were examined and significant variables were entered into a multivariate regression model.

Results: A significant positive association was observed between total sedentary time (mean 417.2, S.D 379.6) and Cholesterol (1.42, 95% CI: 0.18-1.13, p< 0.05) and LDL (0.21, 95% CI: 0.46-1.11 p< 0.05) after adjusting for confounders.

Conclusion (S): Sedentary behavior is associated with an adverse metabolic effect on Cholesterol and LDL as both are the powerful strong markers of cardio-metabolic risk in Thai active older adults.

Fund Sourcing: This work was supported by Thai Health Promotion foundation.

P3C.208

Determining the context of sedentary behaviour in older adults using lifelogging body worn sensors (timelapse camera, activPAL).

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

Older adults are more sedentary than any other section of the population. Increasing understanding of the context of sedentary behaviour (SB) would better inform interventions and guidelines, however limited information is currently available. The context of sedentary time can be monitored passively using wearable timelapse cameras. The aim of this study was to describe the context of older adults' sedentary time. 36 older adults (Mean age = 73.25) volunteers were recruited for the study.

Methods:

Participants wore a Vicon Revue (SenseCam) timelapse camera and activPAL monitor in tandem for between 1 to 7 days. Images captured were extracted from the corresponding periods of sedentary time identified by the activPAL. The context of these periods were analysed using the Sedentary Behaviour International Taxonomy classification system.

Results:

The majority of older adults' sedentary time occurred when they were alone (56.9%), at home (70.1%) and in the afternoon (46.8%). Social sedentary activities were prolonged (18% of sedentary time) but irregular (6.9% of sedentary bouts).

Conclusions:

This study provides valuable information to inform future interventions to reduce sedentary behaviour. Interventions should focus on afternoon sitting time and target the home environment. Addressing social isolation should also be a target, however activities like reading are cognitively stimulating and should not be altered.

P3C.209

Understanding the assets which influence older adults' sedentary time.

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SIG: Yes, Motivational Dynamics

Awards:

Purpose:

Older adults are living longer now than ever before, with the elderly population increasing across the world. In order to help older adults live not just in absence of disease but also to their full potential, it is important to investigate which factors best assist older adults' obtainment of beneficial health behaviours, a concept defined as salutogenesis. Such factors may reduce negative traits, for example prolonged sedentary time. Sitting is an established predictor of detrimental health and by decreasing modifiable sedentary periods, this may help older adults live independently for longer.

The aim of this study was to gain a further understanding of older adults' motivators and perceptions regarding changing their sedentary time.

Methods:

Upon gaining ethical approval, 6 focus groups comprising of 25 older adults (Mean age = 78 years) were recruited from social groups within the Glasgow area. To gain an understanding of older adults' consciousness towards their sedentary time and the factors they thought to influence this, open ended questions were utilised. All discussions were recorded and to ensure the data collected was representative of older adults' opinions, member checking was completed after each focus group. All interviews were transcribed and evaluated using thematic analysis. The research statement used was: factors that influence older adults' sedentary time.

Results:

The factors which influenced older adults' sitting time were categorised into four main themes: personal wellbeing, culture, variability of choice and sensitivity.

Conclusions:

This study offers detailed insight regarding the issues affecting older adults' sedentary time. Similar to Owen's ecological model, older adults' sitting is multifaceted, with personal, social, cultural and political factors all influencing sitting time to some degree. Older adults' reported in depth of personal influences, for example physical and psychological markers of sitting, however more work is required on cultural and political aspects to gain a more complete understanding of their sitting time.

P3C.210

Gender distinctions in the approach towards females with eating disorders

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SIG: Yes, Cancer Prevention and Management

Awards:

Aim:

This survey intends to observe the Albanian community's approaches and predictors of public distance towards females bothered by eating disorder (anorexia nervosa [AN] and bulimia nervosa [BN]) beneath detailed contemplation of the participants' gender. Eating disorder is still frequently perceived as a female's health matter, and those badly affected stay disgraced in developing countries. The concept of public distance is a recurrently used marker in understanding promotions. Gender-detailed outcomes could comprise significant information to destigmatization programs.

Methods:

Records initiate from an Albanian telephone study which was performed in 2014. Literatures with signs and indications also evocative of AN or BN were presented to the participants by chance, who consequently responded questions concerning principles about basis, contact to subjects badly affected the aspiration for public distance. Stratified multiple linear regression analyses consistent with disorder under survey were executed to inspect connections among diverse predictors and aspiration for social detachment.

Results:

There were considerable gender dissimilarities in longing for public distance, fundamental acknowledgments, and expressive responses towards females with intake disorders. Concerning AN, females revealed an extensively greater aspiration for social detachment than men ($p < .001$), and often considered that AN could be originated by sexual mistreatment through childhood. About predictors of social remoteness, there was a major affirmative connection among age and wish for common distance similarly between men and females. Conversely, separate gender distinctions acquired outcome relating to additional predictors depending on the eating disorder under study. In BN, attribution of brain disease emerged as significant predictor of social remoteness between men. This is not correct for females where the acknowledgment of feeble motivation appreciably expected the wish for public distance.

Conclusion:

Gender-reliant discrepancies in approaches and interpreters of social detachment towards women afflicted should be linked with modified measures in anti-stigma movements, tackling females and men on diverse levels.

P3C.211

The effect of health consciousness and health priming on the healthfulness of consumers' in-store purchases

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SIG: Yes, Children and families

Awards:

Purpose: The potential of using priming to promote healthful food choices is promising⁽¹⁻³⁾ but relatively little studied. This study aims to analyse the effect of health consciousness (high vs low) and health priming (present vs absent) on the healthfulness of consumers' in-store purchases under experimental conditions.

Methods: In a 2x2 experimental design, n=50 high health conscious (HHC) participants and n=50 low health conscious participants (LHC) were randomly assigned to one of two conditions (health-primed vs non-health-primed). In the health-primed condition, participants were given the following scenario in-store: *'imagine a friend or family member has just informed you that they are calling by for a meal this evening. You have a limited shopping time of 20 minutes and a maximum shopping budget £15/€20 in which to buy food items for a healthy meal that can be cooked in 30 minutes'*. The non-health-primed scenario did not mention the word *'healthy'*. The healthfulness of each basket was assessed by two methods (1) the Lobstein and Davies (L&D) method⁽⁴⁾ which considers 6 nutrients plus the fruit, vegetable or nut content in 100g of a food and; (2) front-of-pack (FoP) nutritional profile labelling, evaluating salt, sugar, saturates and fat content.

Results: ANOVA results showed that HHC participants shop significantly healthier than LHC participants, and that health-primed participants shop significantly healthier than non-health-primed participants (L&D method). In addition, results showed that while there was no difference between HHC consumers, health-primed and non-health-primed, LHC participants who were health-primed made more healthful purchases when compared to those who were non-health-primed (L&D method). However, when the analysis was repeated with the FoP nutritional profile labelling method, only health consciousness showed a significant effect on the healthfulness of in-store purchases.

Conclusions: The L&D method findings suggest that health priming can lead to more healthful purchases among LHC participants in the setting of grocery shopping, thus supporting the use of priming as a viable intervention tool to promote healthful food choices. Future work may attempt to explore whether these results can be replicated in the participants usual grocery shopping.

P3C.212

Trial to Encourage Adoption and Maintenance of a Mediterranean Diet (TEAM-MED): Protocol for a pilot randomised controlled trial.

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SIG: No, this does not fit in any of the special interest groups

Awards:**Objective:**

Strong evidence links consumption of the Mediterranean diet (MD) to a reduced CVD and type II diabetes risk, however there is uncertainty about whether non-Mediterranean regions will adopt this dietary pattern. To date, interventions that have encouraged individuals to adopt a MD have used intensive dietary change methods that would be expensive and time consuming to roll out. Peer support is a potential novel and low cost strategy for achieving dietary change towards a MD. Further research on the feasibility of peer support for encouraging dietary change, however, is needed. This research aims to assess the feasibility of peer support in encouraging MD adoption in individuals at high CVD risk from a Northern European population.

Methods:

TEAM-MED is a 12 month pilot randomised controlled trial. A total of 75 individuals at high CVD risk will be recruited and randomised to (i) the minimal MD intervention, to receive written information about the MD (n=25), (ii) the proven intensive MD intervention, to receive dietetic support for following a MD and provision of key MD foods (n=25) or (iii) the peer support MD intervention (n=25). The peer support MD intervention encompasses the social support model. It is based on formative feasibility work with the target population, and consists of eleven group-based sessions over 12 months delivered by trained peer supporters. Data will be collected at baseline, 3, 6 and 12 months. The primary endpoint is change in MD adherence, measured using a validated 14-item Mediterranean Diet Score (MDS) with minor modification to reflect the Northern Irish diet. Difference in change in MDS from baseline to 6 months (adoption) between groups will be determined. Secondary endpoints include changes in nutritional biomarkers, markers of CVD and type II diabetes risk and maintenance of a MD (MDS change from 6 to 12 months).

Results:

Results will provide information on the feasibility of peer support for encouraging dietary change towards a MD.

Conclusions:

This research will build an evidence base for the use of peer support for dietary change and help underpin public health policies for the promotion of healthy eating and chronic disease prevention.

P3C.213

Reliability and validity of a self-report measure of workplace sitting and sitting-breaks

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: Research suggests that sedentary behaviour and the manner in which it is accumulated (e.g., frequency of breaks) is detrimental to health. The workplace is a common setting for the accumulation of extensive sitting time. Thus context-specific reliable and valid measures of workplace sitting and breaks are needed. The study sought to reliability test and validate self-report (SR) measures against accelerometer and inclinometer-derived workplace behaviour.

Methods: A previously developed measure of workplace sitting time (Marshall et al., 2010), and a modified measure of frequency of sitting-breaks per work hour (Bennie et al, 2014) was validated and reliability tested. Over a one-week period, desk-based workers (N=60) with a mean age of 32 years (SD= 9.91), completed the SR measure on two occasions, while wearing the Actigraph accelerometer and ActivPAL inclinometer. Significance was set at *p<0.05, **p<0.01.

Results: The SR measure of workplace sitting demonstrated substantial test-retest reliability (ICC = .80**), and the SR measure of workplace sitting-breaks demonstrated moderate test-retest reliability (ICC = .47**). The SR measure of workplace sitting demonstrated a significant, but modest relationship with accelerometer data (rs = .34*) and a non-significant relationship with inclinometer data (rs = .18). Box-whisker plots revealed the SR data, against the accelerometer had minimal bias overall yet large variance; and against the inclinometer underestimated sitting time and had a large level of variance. The SR measure of sitting-breaks demonstrated a significant but modest relationship with accelerometer data (rs = .29*), and a non-significant relationship with inclinometer data (rs = .26).

Implications: The SR measure of workplace sitting and sitting-breaks demonstrated acceptable reliability and low to modest validity. These results are comparable to past research on SR workplace sitting, particularly using the Actigraph as a criterion measure. However, no previous research has reported the validity of a SR measure of workplace sitting and sitting-breaks compared to the ActivPAL. There was variability in agreement between the SR and criterion measures, highlighting that the Actigraph and activPAL are measuring different measures. Findings suggest that SR measures of sitting breaks should be used with caution, and highlights the need for further methodological research into SR sitting-breaks.

P3C.214

The effects of aerobic and anaerobic physical activity on insulin dose reduction in diabetics

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: To prevent hypo and hyperglycemia during exercise, diabetics need to adjust their nutrition and insulin dosage. The aim of this study was to determine whether and how physical activity affects the blood glucose levels and the required amount of insulin in previously sedentary patients suffering from type 1 diabetes.

Methods: Thirty subjects (mean age 26.8 ± 8.6 ; range 16–49 years), 17 female and 13 male, underwent the one month training procedure consisting of either dominantly aerobic type of training (34% of subjects) anaerobic type of training (20% of subjects) or mixed (46% of subjects). All of the subjects suffered from diabetes mellitus, type 1 and were receiving insulin therapy. The HbA1c, the mean blood glucose concentration and the number of insulin units received daily were recorded before and after the exercise intervention.

Results/findings: The results of the Student t-test for independent samples showed that the mean values of HbA1c decreased significantly (7.95 ± 0.73 vs. $7.74 \pm 0.56\%$; $p < 0.001$). Similarly, the decrease in the daily insulin unit consumption was also significant (52.1 ± 6.0 Ins units vs. 42.68 ± 5.2 units; $p < 0.001$), and mean blood glucose as well (8.25 ± 0.78 vs. 7.84 ± 0.68 mmol/L; $p < 0.001$). No differences were found between the groups according to the type of activity but as for the problem of the small number of subjects in each group we could not claim that those do not exist (ANOVA results: Wilks Lambda = 0.715; $F(6.22) = 0.679$; $p = 0.674$). Nonparametric correlation test confirmed statistically significant correlations between the volume of the daily physical activity in minutes and the decrease in HbA1c (Spearman $R = 0.57$); mean blood glucose decrease (Spearman $R = 0.44$) and the daily insulin units used (Spearman $R = 0.54$)

Conclusions: In conclusion, the study confirmed the decreases in HbA1c and in average daily insulin units after the intervention. Also, even though no relation between the type of the activity and the decrease of the monitored parameters was observed, we did manage to confirm the relation of those with the activity volume, meaning that the higher activity volume induced the larger decrease.

P3C.215

Health information behaviour in relation to physical activity of Finnish elderly - The GASEL project

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SIG: Yes, Socioeconomic inequalities

Awards:

European populations are rapidly aging and this specifically applies to Finland. Concurrently health promotion and health communication attempt to reduce and eliminate the risk factors of lifestyle-related health behaviours. However, elderly individuals are not a homogeneous group. Those whose level of physical activity is poorer or education is lower, are in danger of becoming marginalised from the distribution of health information. Physiological and cognitive limitations, attitudes and feelings may have an effect on whether Internet is used, health information is sought, and whether it has an impact on the individual's health decision in their everyday life. However, active use of information has been associated with healthy aging.

Understanding target audiences as well as developing tailored health information are priorities for all health promotion initiatives. More information on the elderly individuals is needed.

Multidisciplinary GASEL (Gamified Services for Elderly) project examines gamified and tailored remote services in promoting wellbeing and health of older citizens, both in individual and communal level. GASEL-project is funded by the Finnish Funding Agency for Innovation for 2014–2015.

In the project, information about the elderly is collected by mapping existing services and applications for supporting wellness and investigating the special needs of older people as a member of information society. This is done by reporting the literature and via a questionnaire survey. Among other things the survey covers aspects of health information behaviour, health information literacy and health communication.

Information has been collected with a questionnaire mailed to a random sample of 1500 subjects 65 to 100 years old inhabitants of Oulu region, identified from the Finnish Population Register Centre. Paper questionnaire was sent by post in the beginning of November 2014. The receivers were able to answer and return the questionnaire electrically or on paper. The response rate was 62.2 percent ($n = 934$). Of the respondents 42.7% were men and 56.9% women. The data storing will finish and the analysis start at the end of March. The study will generate new information on health information literacy, health information needs and health information behaviour in relation to physical activity of the elderly.

P3C.216

Coaches' Adoption and Implementation of Sport Canada's Long Term Athlete Development Model

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SIG: Yes, Policies and environments

Awards:

Purpose:

The Canadian policy on sport and physical activity has identified the need to increase participation in physical activity for good health, while maintaining objectives of excellence. Sport Canada adopted the Long Term Athlete Development model (LTAD) to increase excellence in sport as well as participation to physical activity. The purpose of our study was to explore how coaches adopted or implemented Sport Canada's model and to understand the barriers perceived to both processes.

Methods:

24 coaches were interviewed to determine their experiences in adopting (n=14) or implementing (n=10) the LTAD model. Each interview was transcribed verbatim and uploaded into the QSR NVivo 9 Qualitative software program for analysis.

Results/findings:

A main barriers identified for adoption and implementation of the model is the mismatch between its long-term vision vs. the actual short-term pressure for performance. Our results also suggest the importance of communicating concrete examples of positive effects of LTAD adoption and implementation to coaches, to support their commitment and efforts to integrate LTAD principles in their practice. Coaching education also seems to be an important factor identified by coaches as having an influence on whether or not LTAD will be adopted or implemented.

Conclusions:

Several barriers must be addressed at different levels of organizational structures and policies in Canadian sport to help coaches adopt and implement LTAD. The mismatch between LTAD (long-term vision) and the system of sports financing (short-term vision) should be analyzed in depth to formulate new funding criteria. In the long-term, strategies are needed to assess the real impact of LTAD on many variables, including (a) performance, (b) health and lifestyle of the population, (c) the development of elite sports for all in the country, (d) coaches' education, and (e) the expectations and attitudes of parents.

P3C.217

The Longitudinal Influence of Neighbourhood Green Space on Children's Physical Activity, Screen Time, and Body Mass Index

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

It is often hypothesised that green space (e.g., parks) may influence children's weight status; however, evidence remains limited and largely cross-sectional. Further, hypothesised behavioural mechanisms for this effect, such as physical activity, are poorly understood. The purpose of this study was to investigate associations between neighbourhood green space and children's BMI trajectories over early childhood, and to investigate longitudinal associations with physical activity and screen time.

Methods:

Data came from the Longitudinal Study of Australian Children (LSAC), an Australian Government project that collects data from a nationally representative sample of children. Participants (n=4,423) had their BMI objectively measured, and their physical activity and screen time reported by the parents and child every 2 years between 2006 (age=6-7) and 2012 (age=12-13). Green space data were derived from Australian Bureau of Statistics mesh blocks which classify small land parcels according to their primary use. Participants were assigned an objective measure of green space for their statistical area level 2, the smallest area measure available in the LSAC. Gender-stratified multilevel linear regressions were used to investigate associations between green space and the outcome measures. Growth curve models were used to examine changes in trajectories. The child's family income, maternal education level, Australian indigenous status, and language spoken at home were included as socio-economic controls.

Results:

After adjustment for socio-economic status, a significant interaction between age and green space on BMI was noted for boys ($p=0.009$), but not girls ($p=0.056$), such that the influence of green space becomes more pronounced as children grow older. For boys, each 10% difference in green space was associated with a: (i) 7.3% increase in the odds of choosing physical active pastimes; (ii) 2.4min reduction in weekend television viewing; and (iii) 8.4% increase in the odds of meeting physical activity guidelines on weekends. There were no significant results on girls' physical activity or screen time.

Conclusions:

Green space appears beneficial to boys' BMI as they grow older, but not girls'. Increased physical activity and decreased screen time may explain this effect. Modest differences in green space elicited a response, suggesting small changes to the environment may be beneficial.

P3C.218

PHYSICAL ACTIVITY AND QUALITY OF LIFE IN OLDER BREAST AND PROSTATE CANCER SURVIVORS IN NEWFOUNDLAND, CANADA

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SIG: Yes, Cancer Prevention and Management

Awards:

Objective:

Physical activity (PA) has been found to be a beneficial strategy for older cancer survivors to combat the combined negative effects that accompany both aging and cancer diagnosis. This study aimed to explore the PA behaviours of older (60+) breast and prostate cancer survivors in Newfoundland and the associations between PA and quality of life (QoL).

Methods:

Older breast and prostate cancer survivors (N=60) completed a mailed questionnaire containing assessments of QoL, fatigue, and cancer-specific symptoms (54% response rate). Thirty-five prostate and breast cancer survivors wore an accelerometer to objectively assess PA.

Results:

Of the 60 returned questionnaires, 30% of participants' self-reported meeting PA guidelines of 150-minutes of MVPA. Of the thirty-five participants who wore the accelerometer, 51% of participants met PA guidelines, which was significantly higher than self-report results ($p=.018$). Differences in QoL outcomes between participants meeting or not meeting PA guidelines (objective or subjective measures) were assessed using ANOVAs. Participants meeting PA guidelines, according to objective measures, were found to have greater physical function ($p=.017$) and general health ($p=.019$) compared to those not currently meeting PA guidelines. However, for self-reported PA, participants meeting PA guidelines reported greater physical function ($p=.001$), general health ($p=.001$), and social function ($p=.001$), along with less fatigue ($p=.008$), bodily pain ($p=.024$), and prostate cancer survivors reported less cancer-specific symptoms ($p=.029$) compared to those not meeting PA guidelines.

Conclusions:

Our findings demonstrate a link between PA and improvements in QoL outcomes in older cancer survivors. However, the relationship varied depending on how PA was assessed. Limitations such as our sample size hinder our ability to make definite conclusions, however our results highlight the need for future large-scale trials to explore the relationships between both self-reported and objectively measured PA and QoL outcomes. Despite the benefits of PA, at best only half of the participants were meeting the PA guidelines, demonstrating a need to increase PA. Therefore, it is important to develop and implement novel and innovative methods for increasing PA in older cancer survivors to improve survivorship.

P3C.219

Children's Recreational Screen Time and its Association with their Academic Achievement and Body Weight

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SIG: Yes, Early care and education

Awards:

Objective:

Given the increasing popularity of screen-based media among children, concerns have been raised about increases in sedentary activity and displaced time for homework. This could potentially result in increased body weight and decreased school performance. As such, we investigated the association of children's screen time with their performance on standardized exams and with their body weight.

Methods:

Health behavior survey data collected in 2012 in Alberta, Canada from 2,795 students aged 10-11 was analyzed. Parents consented to have the child participate in the evaluation and to have the child's survey data linked with their performance on standardized provincial exams. Children reported, in hours per day, use of computers, television, and video games outside of school hours. Screen time was split into four categories of low, medium-low, medium-high and high. Children's heights and weights were measured for BMI calculation. Mixed effects models were applied to assess the association between children's screen-time usage and outcomes of academic achievement and body weight status. The analysis was stratified by gender and considered parental education and household income as confounders.

Results:

Boys reported higher screen time than girls, while girls scored, on average, higher than boys on standardized exams. Compared to the lowest use category, boys and girls who reported the most screen time scored approximately 10% lower on their standardized exams (Boys β : -10.30 [95%CI: -18.63, -1.95], Girls β : -10.00 [95%CI: -17.46, -2.54]). A trend can be observed that as screen time increases, academic achievement decreases. No significant associations were observed for screen time and body weight.

Conclusions:

High screen time use appears to have a pronounced negative effect on children's academic outcomes while no effect is observed on body weight. Health promotion strategies that encourage less recreational screen time, especially among high users, may improve academic outcomes for children. Further research on the relationship between screen time and body weight is merited.

P3C.220

Get a GRIP! (Getting Research into Practice): A collaborative planning approach to inform the implementation of an intervention to reduce sitting in the primary school classroom

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Sitting time (ST) is ubiquitous in the school classroom. This is concerning as prolonged sitting may be detrimental to children's health. As recognised in the Medical Research Council's (MRC) complex intervention framework, 'passive' implementation strategies are ineffective at getting research into practice (GRIP). Crucially, our project adopts an 'active' approach to implementation that is collaborative with stakeholders at all stages. This paper will report on stakeholder engagement data and describe the first phase of collaborative planning to inform the implementation of a 'toolbox' of strategies for teachers to use to reduce/break-up ST in the primary school classroom.

Methods: This planning approach follows the Collaboration for Leadership in Applied Health Research and Care-East Midlands (CLAHRC EM) model, which focuses on removal of implementation barriers by co-production of knowledge between academic and service staff and accounting for the targeted organisational context¹. The implementation plan comprises 4 strategies: 1) appointment of project 'knowledge brokers' and formation of a stakeholder network; 2) formative focus groups/interviews with stakeholders; 3) systematic review of implementation evidence from classroom ST interventions; and 4) delphi study to elicit implementation information from previous classroom ST intervention deliverers.

Results: To date, two knowledge brokers with previous teaching/intervention experience have been appointed to the project and participated in semi-structured interviews. Formation of the stakeholder network is ongoing, and focus groups with stakeholders (i.e. pupils and class teachers) are planned for April-May 2015. The systematic review commenced in February 2015, and the delphi study in March 2015. Findings from stakeholder focus groups will be presented in this paper.

Conclusions: Implementation science is an emerging area in sedentary behaviour research. Issues surrounding implementation are typically explored towards the end of intervention studies, e.g. in a process evaluation. In contrast, this paper will report on data from stakeholder focus groups and describe a novel approach to implementation planning that actively builds implementation into the project from the outset and at all stages. It is expected that early and ongoing collaborative work with stakeholders will increase the efficiency and efficacy of getting this research into practice.

1. Rowley et al. (2012). *Implementation Science*, 7:40.

P3C.221

Acceptance and Potential Consequences in Food- Selection of a Physical Activity Based Food Label-System in younger and higher educated people

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SIG: Yes, Policies and environments

Awards:

Objective: Food choices are dependent on various cognitive and emotional factors. This study aimed to test acceptance of a physical activity (PA) based food format and potential consequences for food choices.

Methods: 478 persons participated in an online survey randomized to a quiz about food and energy. Everyone was presented with two sections of 13 sample food items consumed throughout the day in various settings; the first section with nutritional information (NI) using Nutrition Fact Label (NFL), the second section with PA format showing how many minutes on average a person would need to run or bike to expend the energy from the food "consumed".

Results: PA format reduced the frequency of energy dense meal intake and led to choosing meals with low PA requirements in over 58% of consumers; this change was stronger for main meals and weaker for snacks, and stronger in women and the randomized group. Weight control and weight satisfaction in women, and BMI and counting energy intake in men predicted influence of PA format on subsequent behavior. 62.0% of women (m: 47.1%) totally/agreed that such PA format would influence their food choices; 66.4% of women and (m: 47.1%) totally/agreed that a PA format would influence the frequency of energy dense food intake. Consumers engaged in weight loss or weight maintenance responded most supportive. 60.6% of women (m: 44.7%) totally/agreed that such PA format would lead to choosing lower PA intense food items; particularly consumers engaged in weight loss (71.6%) or weight maintenance (51.8%). 25.1% of women (m: 39.0%) totally/disagreed that such PA format would influence their food selection.

Conclusion: PA format influenced reported food choices and reaches more consumers than NFLs. It is a supporting addition to existing NFLs allowing an easier, intuitive and personalized understanding of energy balance by providing behavior-associated information.

Abbreviations: PA Physical Activity, NFL Nutrition Fact Label, NI Nutritional Information

Keywords: nutrition fact label, physical activity format

P3C.222

An exploration of the structure of personal social networks and physical activity level

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose:

The link between social networks and health behaviours, including physical activity (PA), is a growing research area and several network characteristics have been identified as important predictors of behaviour, including network size, diversity and type (Smith & Christakis, 2008). However, research has tended to be centred on female adolescent populations and has utilised a method (whole network analysis) which restricts the quality and depth of information that can be attained. An alternate method of data collection, personal network analysis, may be more appropriate to investigate the link between social networks and health behaviours by providing a more in-depth, individual account. To date no research has adopted a personal network approach to study health behaviours including PA. The purpose of the current study is to explore the association between the 'structure' of social relationships and PA.

Methods:

Participants were recruited from several medium sized organisations (200-600 employees) in the south of England. A total of 168 office-based staff (70 male, 98 female) completed an online questionnaire measuring self-reported PA and the barriers and benefits of exercise. A follow-up interview was completed with 57 participants. The interview collected data regarding personal network structure by following a standardised 'pen and paper' procedure described by Hogan et al. (2007). Network variables collected were size, density, volume, homophily, PA, role and closeness. Data was inputted into EgoNet (McCarty, 2009) personal network software and a range of structural variables computed. A linear multiple regression was performed to assess the association between network structure and PA.

Results:

Regression analysis explained 26.4% of the variance in PA ($r=0.575$, $r^2=0.331$, Adj. $R^2=0.264$) with only two structural variables included (close alter PA and PA homophily). If people named by participants were considered very close and physically active and this positively correlated with how active participants were. In addition, several distinct types of network were identified.

Conclusions:

Certain aspects of network structure were predictive of PA, however additional research is warranted to explore the role personal networks have in predicting PA, including investigating the potential influence of network type.

P3C.223

Let's Move It: Intervention development and protocol for a school-based multi-level program to increase physical activity and decrease sitting among youth

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SIG: Yes, Motivational Dynamics

Awards:

Objective: High-quality school-based intervention studies are sparse among older adolescents, and specifically among lower-educated (i.e. vocational colleges). The few existing studies lack solid theory- and evidence-base in program development and fail to show long-term effectiveness. The objective of this poster is to present the evidence-based development of the intervention, including theory-based behavior change techniques.

Methods: To aid in the theory- and evidence-based development work, systematic approach and frameworks (Intervention mapping, Behaviour Change Wheel) were used. Reviews of existing evidence, including a systematic review and coding of Behaviour Change Techniques (BCTs) of 10 trials, and original research in the target population informed selection of change targets and intervention strategies. The acceptability of the first version of the intervention was tested in a randomized feasibility study in 2014 in a vocational college. At baseline and six months after baseline psychosocial mediators as well as objective PA with accelerometry were measured, along with participant feedback (both qualitative and quantitative).

Results: The systematic review of literature indicated that effectiveness may be associated with more rather than fewer BCTs, and certain BCTs specifically (e.g. goal setting, action planning). The first version of the intervention was based on theory (e.g. self-determination and self-regulation theories), with a focus on group sessions for students and teacher-led activity breaks. The feasibility study indicated high acceptability of intervention among students ($N=43$) and teachers ($N=16$), with an average satisfaction with the intervention of 4.8 ($SD=0.4$, scale 1-5). Intervention content was optimized based on observations from the feasibility trial.

Conclusions: The optimized complex intervention targeting Capability, Opportunity and Motivation to Behaviors (COM-B model) that increase PA and decrease sitting time, delivered as 1) six intracurricular group sessions, 2) activity breaks and sitting reduction practices in classrooms, and 3) increased opportunities to use community and school PA facilities and provision of home workout videos. Activities are supported by a school team, web resources, and a poster campaign. Intervention is manualized, and fidelity of delivery and participant enactment will be monitored. This ongoing cluster-randomized intervention study is the first randomized controlled trial to target adolescents specifically in lower-educational track.

P3C.224

Fitter but lazier? - Exploration of 'side effects' in sedentary young adults participating in an exercise intervention.

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SIG: No, this does not fit in any of the special interest groups

Awards:**Objective:**

Exercise interventions to improve aerobic capacity are important to prevent the development of cardiovascular disease. However, little is known regarding unintentional 'side effects', for example on unstructured physical activities (PA). Previous studies focused on effects of exercise interventions on PA in clinical samples and older people (Stefani et al., 2013; Rangan et al., 2011) and used subjective measures of physical activity which are prone to recall bias. Therefore, we analyzed 'side effects' on unstructured PA (measured with accelerometers) in sedentary young adults participating in an aerobic exercise intervention (RCT).

Methods:

Sixty-one students (M = 21.48 years, SD = 1.63) were randomly assigned to control (CG) and intervention group (IG). The IG participated in an aerobic exercise intervention of three months with two running sessions (individual heart rate zones) per week. Aerobic capacity (VO₂max) was assessed via cardiopulmonary exercise testing pre- and post-intervention. Unstructured PA was operationalized via Activity Energy Expenditure (AEE) and activity intensity (acceleration raw data in milli-g) and assessed by using accelerometry during waking time for two days at the beginning (T0), after five weeks (T1), and after three months (T2) of intervention.

Results:

Aerobic capacity was significantly higher in the IG compared to the CG after the exercise intervention ($F(1, 57) = 61.85, p < .001, \eta^2 = .052$). However, the within-group analyses for unstructured PA revealed a significant decrease of AEE in the IG from T0 to T1 (8.3%; $t(27) = 2.118, p = .045$) and from T0 to T2 (16%; $t(27) = 3.172, p = .004$). Furthermore, there was a significant decrease in activity intensity from T0 to T2 (16.3%; $t(27) = 2.833, p = 0.009$) in the IG. These significant changes in unstructured PA were not observed in the CG.

Conclusions:

An aerobic exercise intervention can lead to reduced unstructured PA in young formerly sedentary adults. The preliminary findings of the present study suggest that in sedentary individuals, the initiation of regular exercise may be accompanied by reduced unstructured PA in daily life. More studies are needed to examine particularly 'side effects' of exercise interventions on unstructured PA.

P3C.225

"They should stay at their desk until the work's done": challenging perceptions of sedentary behaviour in a desk-based occupational setting

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SIG: Yes, e- & mHealth

Awards:**Objective:**

Sedentary behaviour is a risk factor for adverse health consequences, regardless of how much physical activity a person takes. Given the amount of sitting time accumulated in the workplace, interventions to reduce sedentary behaviour and promote physical activity at work is a priority target for health promotion. However, little is known about how to effect change. This study aimed to explore desk-based office workers' perceptions of factors that limited or encouraged sedentary behaviour and physical activity at work, including the use of a novel mobile phone application.

Methods:

We invited office staff (2 managers; 12 employees) in a software engineering company to participate in semi-structured interviews to explore influences on workplace sedentary behaviour and physical activity. We assessed their level of sedentary behaviour and physical activity using an Actigraph GT3X+ accelerometer and the Global Physical Activity Questionnaire, to provide context for comments. Sedentary behaviour and physical activity and were assessed by accelerometers again after they used a mobile phone application to record their activity for two weeks. Their experiences of using the application as a prompt to change behaviour were explored by questionnaire. Interviews were analysed using a thematic framework.

Results:

On average participants accrued 400 mins of sedentary behaviour but only 36 minutes of physical activity per day. There was a 19% reduction in the time spent in sedentary behaviour after two weeks of using the mobile phone app to self-track behaviour. Major barriers to workplace physical activity included the pressure of 'getting the job done', a perceived need to sit at a computer to work, personal preferences for the use of time at work, and a lack of facilities. Incentives for reduced sedentariness included definite reasons to leave their desks, social interaction and relief of physical and mental symptoms of prolonged sitting.

Discussion:

Perceptions of the cultural context and physical environment at work, as well as personal factors, must be considered when advising people to reduce their workplace sedentary behaviour. More research is required to identify appropriate approaches to this challenge and inform public health practitioners how best to help promote healthy behaviours at work.

P3C.226

Child Care Providers' Perspectives on Suggested Policies from the Let's Move Child Care Checklist Recommendations

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SIG: Yes, Early care and education

Awards:

Let's Move Child Care Checklist is an evidence-based set of wellness practices that caregivers are encouraged to implement in child care settings. Few published studies have examined child care providers' perspectives pertaining to the feasibility of implementing these best practices in their settings. At a child care providers' continuing education event, a total of 206 caregivers completed a survey about the feasibility and current implementation of nutrition and physical activity practices in their early childhood education (ECE) settings. In general, ECE caregivers felt that the Let's Move Child Care nutrition and physical activity practices were feasible (60-98%, depending on the practice), but a much smaller percentage of providers indicated that their child care setting had written policies that corresponded with the recommended best practices (24-59%, depending on the policy). In general, caregivers rated physical activity practices as more feasible compared to the nutrition practices. Practices from the Let's Move Child Care Checklist were broken down into sub-domains. Among the most feasible nutrition practices were items from the following sub-domains: Supporting Healthy Eating; Eating Practices; and Beverages. The least feasible nutrition practices were from the following sub-domains: Food Offered Outside of Regular Meals; Supporting Healthy Eating; and Meats, Fats, and Grains on Menus. The Supporting Healthy Eating category had some items with mixed feasibility ratings (low and high). The most feasible physical activity practices were from the following sub-domains: Supporting Physical Activity; Play Environment; and Active Play and Inactive Time. The least feasible physical activity practices were from the Physical Activity Education sub-domain. The feasibility of each practice/policy will be presented, as well as the implications of promoting practices/policies demonstrated to support children's development of healthy preferences in an ECE society.

P3C.227

Creating a Healthier Environment through a Novel User-Friendly Approach to Menu Labelling in the West of Ireland

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SIG: Yes, Policies and environments

Awards:

Purpose: With eating out-of-home becoming more common, menu labelling has garnered growing public and legislative support as a potential strategy for addressing the obesity epidemic. The aims of this research were to examine the impact of novel and user-friendly heart healthy awards on consumers buying behaviour and to explore perceptions of this initiative from food establishment's perspectives.

Methods: This quasi-experimental study recruited a convenience sample of eight food establishments; all with at least one menu item meeting the heart healthy award criteria. Sales of all menu items sold over an eight week period were tracked; 4 weeks prior to and 4 weeks during display of the awards on their menus. The sales data were used as a proxy to measure response to menu labelling. In addition, structured interviews were conducted with staff from each food establishment. The aim of the interview was to explore the perceptions of each foodservice establishment to heart healthy awards. To assess pre-award versus post-award menu items sales, the non-parametric Wilcoxon signed-rank test was conducted. Furthermore, descriptive statistics were used to analyse the interview data.

Results: The interviews revealed that consumer demand was the main reason for engaging in the menu award programme. Notably, half of the food establishments made changes to their food practices to improve nutritional profile as a consequence of engaging in the programme. The absolute change in menu item sales showed a clear trend towards an increase in heart-healthy menu item selections with an increase of 556 of the healthier menu items sold over the 4 week period. The study was underpowered to detect a statistically significant difference.

Conclusion: Food and eating environments contribute to the increasing epidemic of obesity and chronic diseases. Food establishments are critical stakeholders in public health interventions to promote healthy food environments outside the home. Menu labelling may help consumers to make healthier food choices and may encourage food establishments to improve the nutritional profile of the foods and beverages they offer. As the current study used a small convenience sample of food establishments, larger studies are necessary to confirm these results.

P3C.228

Are lifestyle interventions after gestational diabetes successful in changing diet and physical activity behaviour? A systematic review.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Gestational Diabetes Mellitus (GDM) is a form of diabetes diagnosed during pregnancy affecting up to 16% of pregnant women. Recent guideline changes for GDM diagnosis and increases in obesity and unhealthy lifestyles, have increased the number of women being diagnosed with GDM. Women with GDM are at risk of developing type 2 diabetes, but lifestyle intervention can reduce this risk.

Purpose: To systematically review published studies on lifestyle interventions for women with prior diagnosis of GDM. This abstract reports on study characteristics, intervention design and study quality and changes in diet and physical activity outcomes.

Methods: Databases (Web of Science, The Cochrane Library, EMBASE and Science DIRECT) were searched from 1980 to April 2014 for randomised controlled trial, controlled trials or pre-post design trials of lifestyle interventions targeting women with previous GDM reporting at least one behavioural, anthropometric or diabetes outcome. Relevant data were extracted and methodological quality was assessed using Cochrane criteria for judging bias in intervention studies.

Results: In total 13 studies were included with three rated as low bias risk. Three study interventions targeted physical activity only, two targeted diet only and eight targeted combined diet and physical activity. Three studies reported on intervention adherence. Recruitment rates were poor (7-28% of women approached then participated) but study retention was good (retention rate at follow up 80-100%). Eleven studies reported on change in physical activity. Six studies found significant increases in physical activity after receiving lifestyle interventions targeting PA only (n=1), PA and diet (n=5). Only one of these studies was rated as low risk of bias. Six studies reported on change in dietary intake. All found a positive effect on a dietary variable favouring the intervention group including studies targeting diet only (n=1) and PA and diet (n=5). Only one of these studies was rated as low risk of bias.

Conclusions: There is good evidence for a change in diet behaviour following lifestyle intervention in women with prior GDM, but only minimal evidence for a change in physical activity behaviour. A lack of high quality studies limits this conclusion. Recruitment into trials appears particularly challenging.

P3C.229

The food environment and choice architecture of German university and hospital canteens: Findings from a multi-method cross-sectional study

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SIG: Yes, Policies and environments

Awards:

Purpose:

Canteens can influence food intake, the formation of dietary habits and diet-related health outcomes. We aimed to identify areas for improvement and best practice examples among 37 university hospital- and medical faculty canteens in Germany.

Methods:

Data was collected using a) an online survey among canteen users (n=4847) with 48 items on the food environment and perceived barriers to healthy eating, b) weekly menu plans, which were analysed using a coding matrix with 27 items on the price and composition of individual dishes (n=883), and c) on-site visits by the research team (ongoing). We assessed (i) subjective perceptions of the food environment by canteen users, (ii) the availability of healthy food, based on recommendations of the World Health Organization and the German Nutrition Association; and (iii) the choice architecture and food environment offered by canteens in terms of accessibility, pricing and salience, and other factors that can influence food selection and intake.

Results:

Most canteen users perceive their canteen as unsupportive of healthy diets. Median agreement with the statement "My canteen supports healthy eating" was 23% (IQR:41), and 33% (IQR:47) for the statement "In my canteen I can relax and recover". Preliminary results from the menu analysis showed that on 195 of 210 days (93%), at least one vegetarian dish was offered, while dishes containing meat were offered on 89%, dishes with a vegetarian protein source on 51%, and seafood on 29% of days. Of all dishes offered during the study period, 40% were vegetarian, 32% contained red meat, 17% white meat, and 8% sea fish. Dishes containing red meat were on average cheaper (2.39 €, SD=0.8) than those containing white meat (2.62 €, SD=0.7) or seafood (2.69€, SD=0.7), but more expensive than vegetarian dishes (2.14€, SD=0.6).

Conclusions:

While healthy food options are available at most canteens on most days, the overall menu structure does not reflect standard dietary recommendations. The pricing structure is inconsistent with regard to incentives for choosing healthier options. There is significant variation amongst canteens, and considerable room for improvement exists in most of them.

P3C.230

Tracking of sitting behavior from childhood into adolescents

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose. The current study examined tracking of sitting behavior (sitting time and fragmentation) from 7 to 15 years of age.

Methods. Participants (n=507 at age 7) were recruited from the Gateshead Millennium Study cohort. Measures were collected when children were 7 years, 9 years, 12 years and 15 years of age. Sitting behavior was measured using an ActiGraph GT1M accelerometer and epochs defined as sitting using a cut point of ≤ 25 counts/15s. The total number of breaks per hour and the number of sitting bouts per hour (fragmentation index) were calculated. Breaks and bouts were defined as 4 consecutive epochs >25 counts/15s or ≤ 25 counts/15s, respectively. Differences in sitting time and sitting fragmentation between time points were examined using the Friedman test. Tracking was examined using Spearman's correlation coefficients. In addition, kappa statistics were used to examine the extent to which participants moved between thirds of the distribution between time points.

Results. Average daily sitting time increased from 51.3% at age 7 to 73.4% at age 15. Sitting became less fragmented over time with results showing a decrease in mean breaks per hour from age 7 to 15 (8.5 to 4.2) as well as a decrease in mean fragmentation index (16.7 to 13.0). Spearman's correlations for sitting time and breaks in sitting time were moderate to strong from age 7 to 15 ($r=0.48$ and $r=0.43$, respectively). Correlations for the fragmentation index were weak from age 7 to 15 ($r=0.28$) but moderate to strong from age 12 to 15 ($r=0.53$). Sitting time and fragmentation expressed as breaks per hour remained relatively stable from age 7 to 15 ($k=0.27$ and $k=0.28$, respectively). However, in line with the reported correlations the fragmentation index appeared to be less stable from age 7 to 15 ($k=0.06$).

Conclusions. This study shows high levels of sitting during childhood and adolescence, with marked increases in sitting time and reductions in sitting fragmentation with age, and moderate tracking of sitting behavior. The biggest changes in sitting behavior took place from age 9 to 12 years. Therefore, it is recommended to target sitting behavior modification efforts at childhood.

P3C.231

Using the Intervention Mapping Protocol for developing the content of a healthy eating blog to improve consumption of fruit and vegetables among adult women

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SIG: Yes, e- & mHealth

Awards:

Purpose: To describe the use of the Intervention Mapping (IM) protocol for developing a dietary intervention delivered through an evidence-based healthy eating blog (HEB).

Methods: We used the following six steps of the IM protocol to develop the HEB: 1) Identifying health problems, their determinants and target populations; 2) Formulating change objectives to achieve the desired behavior including performance objectives - a reflection of what needs to be done to achieve the desired behavior - and selecting specific determinants of behavior change to target; 3) Choosing the theoretical methods and practical applications for the behavior change; 4) Developing the intervention, including sequence and content; 5) Developing a plan for program adoption and implementation, such as a feasibility study; and 6) Evaluating the intervention.

Results/finding: In accordance with the IM protocol, 1) the behavior selected was the consumption of fruit and vegetables (F&V) because it is considered a good predictor of overall diet quality and a critical factor for preventing diet-related chronic health conditions. 2) We identified seven performance objectives such as knowing a variety of F&V, and exploring F&V preparation and cooking techniques. The selected determinants of F&V consumption were knowledge, attitude, self-efficacy, and motivation/goals. 3) Abraham and Michie's taxonomy of effective behavior change techniques was used to determine how to intervene on the identified determinants. 4) We targeted one determinant per week, per objective, which resulted in 28 posts to be published on the blog over the six-month intervention. 5) A feasibility study is currently ongoing with 80 women to capture their views on potential barriers/facilitators to the adoption and implementation of the intervention 6) Feasibility will be assessed by collecting compliance rates (e.g. whether women consulted each blog post), participation rates (e.g. comments on the blog) and dropout rates. Acceptability and satisfaction toward the HEB intervention will be assessed using questionnaires and focus groups.

Conclusion: The IM framework proved helpful to systematically plan the development of the intervention to be delivered through our experimental HEB. The effectiveness of the intervention for improving consumption of F&V among HEB readers will be evaluated through a full randomized controlled trial.

P3C.232

The influence of weather for objectively measured sedentary behaviour and physical activity in cardiac rehabilitation

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Little research has examined the relationship between weather and objective measures of sedentary behaviour and physical activity. Despite weather being identified as a barrier to engaging in physical activity for cardiac rehabilitation (CR) patients, most work has only examined seasonal differences and physical activity. We therefore examined the relationship between daily temperature and precipitation and time spent in sedentary, light-, and moderate-to-vigorous-intensity activity in CR.

Methods: Patients from the *ENCORE* study wore an accelerometer for 9 days at the beginning (i.e., within the 1st 3 weeks) and end (i.e., within the last 2 weeks) of CR and completed a social ecological survey. Weather data regarding average daily temperature and precipitation (dichotomized 0 = no, 1 = yes value, as to whether or not it precipitated on a given day) was obtained from Environment Canada. For the current abstract, data is only available for baseline collection (the beginning of CR). The sample (N= 190) was predominately < 65 years old (56%), male (76%) and White (95%).

Results: A multi-level model was created such that a random intercept was included with fixed effects for the linear, quadratic, and time varying covariates at Level-1 (i.e., daily average temperature and daily precipitation) controlling for the time invariant covariates at Level-2 (i.e., age, gender, number of co morbidities and season). No significant association was found between mean daily temperature and time spent being sedentary or active. Nevertheless, precipitation was found to have a significant association with minutes/day of sedentary ($\beta = .06, p < .05$), light-intensity ($\beta = .11, p < .001$), and moderate-to-vigorous-intensity ($\beta = .09, p < .001$) activity.

Conclusions: It appears that precipitation may be an important correlate to sedentary and physical activity behaviour in CR patients. On a given day that it precipitates, CR patients spend more time being sedentary and less time being physically active.

P3C.233

An exploration of the types and sources of social support for physical activity that are provided and received in an office-based workplace.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Peer health champions are an important component of multilevel workplace health interventions (Linnan, Fisher, & Hood, 2013) but as yet there has been limited exploration of how champions influence peer behaviours. One study suggested that social support was key to workplace champions effecting physical activity (PA) behaviour change (Edmunds et al., 2013) but detail about what types (Wills & Shinar, 2000) and sources of support were effective was not evaluated. The objective of the current study is to explore naturally occurring social support for PA that employees provide and receive.

Methods:

A public sector employer in the south of England, with approximately 600 office-based staff participated. An online survey invited all staff to: report their PA; name specific individuals within the organisation who provide different types of social support for PA (emotional, informational, companionship, validation); and report how frequently this support was sought. Three focus groups explored the type and function of social support provided by colleagues for PA in greater depth. In addition those individuals who were identified as providing support for PA most frequently (n=6) participated in one-to-one interviews to explore how they provided this. Focus groups and interviews were audio recorded, transcribed verbatim and analysed using an inductive content analysis.

Results:

98 employees completed the survey, 39±12 years, 59% female, 21% not meeting PA guidelines. Participants identified 0-8 people as providing them with support. The most frequently identified type of support was companionship (99 instances), followed by information (97 instances), encouragement (66 instances) and validation (43 instances).

Qualitative analysis identified that those seeking support found it either difficult to access, or that what was available was not appropriate. They desired support to be non-judgemental and to maintain autonomy over when to access it. Support providers offered companionship and informational support and tended to think that a lot of appropriate support for PA was available within the organisation. Differences between the perceptions of those who were seeking support and those who provided support are explored.

Conclusions:

These findings will help inform the selection and training of peer PA champions in future intervention programmes.

P3C.234

Study of young people's attitudes to policy interventions targeting childhood obesity; a PlayDecide participatory event

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SIG: Yes, Policies and environments

Awards:

Introduction: Childhood obesity is at the fore of global health policy debate; the problem is global and its incidence, though stabilised across European countries (OECD 2015), is nevertheless high (UN, 2012; WHO, 2014). Worries about this issue are shared by the media, the public, and many governments and organisations, but the possible policy answers are disputed. Children and teenagers themselves are the main targets of policy interventions, but little is known about their own attitudes to childhood obesity and the proposed solutions.

Objectives: The present study aims to explore young people's attitudes towards policies targeting childhood obesity.

Participants: 136 young people, aged 16 to 21, from Italy, Slovenia, Spain and the UK.

Procedure: Participants in an activity with a broader scope (PlayDecide, consisting of a table top game and group discussion) filled in questionnaires about their own health and health risks, as well as their attitudes to stakeholders and to 18 policy options. The study was part of a deliberative engagement event that allows a group of citizens to debate controversial issues and identify policy solutions. A series of PlayDecide engagement exercises were organised and facilitated by science museums on the topic of childhood obesity, across the four European countries.

Results: The policy options have been grouped into five categories, based on a factor analysis of participants' responses: *educational policies*; *poverty-related economic policies*; *heavily interventionist hard policies*; *industry-related policies* that aim to regulate food production and marketing; and *soft policies* that involve monitoring with little intervention. Participants who reported more health behaviours had a stronger preference for educational policies; women had a stronger preference for economic policies; and those who perceived their personal risk for obesity as being higher had a stronger preference for industry-related policies.

Implications: Different policies seem to answer different types of concerns. Educational policies are more relevant for those who are already preoccupied with improving or maintaining their own health. Industry-related policies seem attractive to those who are worried about their health.

P3C.235

Practical considerations when using a postal method for a national level accelerometer & GPS data collection in children - the SPACES study

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SIG: Yes, Policies and environments

Awards:

Objective:

The SPACES study (Studying Physical Activity in Children's Environments across Scotland) is a large-scale, nationwide, accelerometry and Geographic Positioning Systems (GPS) data collection involving children from across mainland Scotland. Due to the wide geographical spread of the sample, a postal method of data collection was chosen and here we highlight some of the major considerations involved in conducting a study of this nature.

Methods:

Participants (n= c.2,200, aged 10 years old) were sub-sampled from Growing Up in Scotland (GUS) - a nationally representative, longitudinal, birth cohort project. All study materials (invitation letters, registration documents, accompanying information, devices, chargers, and questionnaires) were sent and retrieved by post.

Results:

Our piloting highlighted issues with the physical delivery of study devices. Postal regulations required devices with Lithium-ion batteries (e.g. GPS) to be prepared and packaged in a certain way. For example, devices had to be switched off, and senders name and return address had to be clearly visible on the packaging. GPS chargers were initially too large to fit through letterboxes and alternative chargers had to be sourced. Even with acceptable dimensions, some devices were not delivered through letterboxes and taken to a central location for collection.

Conclusions:

Postal regulations have ethical implications as participant name and address cannot accompany participant data. One solution would be to use the research unit address as the sender in both directions. With GPS devices switched 'off' when sent, participants complete a further step before commencing the study - increasing the risk of inaccurate, or no, data. Adequate instructions are therefore essential. Devices that aren't delivered through letterboxes increase participant burden by requiring them to visit a central collection location. In remote or rural areas this can be particularly problematic as distance to the nearest collection point may be considerable. If using this approach, researchers should be aware of the practical challenges and, where possible, integrate procedures that reduce their implications, including participant burden.

P3C.236

Where do people with heart disease engage in physical activity when they aren't enrolled in cardiac rehabilitation programs?

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SIG: No, this does not fit in any of the special interest groups

Awards:

Objective: Little is known regarding the various contexts where people living with heart disease engage in moderate to vigorous physical activity (MVPA), which is critical to know when designing contextually relevant interventions. Therefore, the current study used an accelerometer /GPS approach to address this issue.

Methods: Heart disease patients from 8 sites across Canada wore an Actigraph accelerometer and a Qstarz GPS unit for 9 days at 2 time points (baseline and 6-months later to ensure seasonal variation) using a 5-second epoch. The 5-second epoch was reintegrated to a 60-second epoch, after which bouts of at least 10 minutes of MVPA were calculated in Actlife 6.0. Each bout was then linked using ArcGIS 10.1 to identify where each minute of MVPA occurred.

Results: 329 CHD patients completed the baseline assessment (mean age = 65.35; 71.7% male; 89.3% white) and 296 completed the 6-month follow-up (retention rate = 90%). At baseline, there was a total of 25,279 minutes of MVPA occurring in bouts across participants. The top 5 locations where MVPA occurred were: at the participant's home (55.4%), on sidewalks (10%), on a street (9.3%), in non-residential buildings (6.6%), and on trails (4.6%). At the 6-month follow-up, a total of 16,749 minutes of MVPA occurred across participants. The top 5 locations for MVPA were: at home (49.6%), on sidewalks (11.5%), on trails (8.4%), on a street (6%), and in a residential house that wasn't the participant's home (5.7%).

Conclusions: This is the first study to objectively assess where heart disease patients engage in MVPA. Although it appears that the patients' homes will be a key context to focus on when developing a MVPA intervention, it is important to note that over 50% of MVPA still occurs outside of their homes.

P3C.237

Objectively measured physical activity and sedentary behavior in obese adolescents, and their relationship with fatness and metabolic outcomes.

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: To describe the physical activity (PA) and sedentary behaviour (SB) levels of obese adolescents (12-19 year-olds), and investigate the association of SB and moderate-to-vigorous PA (MVPA) with fatness and metabolic outcomes.

Methods: Baseline measurements were obtained from 102 obese (body mass index (BMI)>95th centile UK1990 reference) adolescents participating in a multicomponent obesity treatment trial- the Healthy Eating and Lifestyle Programme. PA/SB were measured with ActiGraph accelerometers (15-second epochs), time spent in SB, PA and MVPA was derived using Evenson et al's (2007) cut-points, and participants were included for analyses if providing ≥3 valid days (≥10hours wear-time). Total, low- and high-density lipoprotein cholesterol, triglycerides, insulin and glucose were obtained from fasting blood samples. Height, weight and waist circumference were measured by trained staff, fat mass (FM) and fat-free mass (FFM) were determined from bio-impedance analyses, and BMI and FM Index (FM/height²) were derived. Sex differences were assessed with chi-square or Mann-Whitney U tests, and associations of MVPA and SB with fatness and metabolic outcomes were assessed with univariable and multivariable linear regression.

Results/findings: Adolescents spent a median of 4.5hours/day in PA (including 38.5min/day MVPA) and 12.7hours/day in SB, with 86% spending over two thirds of their day in SB. Boys spent more time in MVPA than girls (median: 48.6min versus 35.9min; p=0.004), and were more likely to meet guidelines of ≥60min/day in MVPA (24.3% versus 9.2%; p=0.04).

Univariable regressions showed significant associations of MVPA with FM Index (B=-0.05), FM (B=-0.11) and FFM (B=0.14), and SB with Insulin (B=-0.02; all p<0.05). After including MVPA and SB in the same model and adjusting for age, sex, and wear-time, only MVPA remained significantly associated with FM Index (B=-0.05; p=0.04) and FFM (B=0.13; p=0.008).

Conclusions: Most adolescents did not meet current UK PA guidelines, and spent a worryingly high proportion of their day in SB. Although causality cannot be inferred, results highlight the importance of promoting MVPA to improve the body composition profiles of obese adolescents.

P3C.238

"My Meal Mate" (MMM), a new smartphone application designed to facilitate weight loss: pilot study results

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SIG: Yes, e- & mHealth

Awards:

Objective: A smartphone application (app) which allows self monitoring of diet and activity could give a unique opportunity to deliver a convenient and wide-reaching weight management intervention. The University of Leeds has developed and validated a smartphone application for weight loss called "My Meal Mate" (MMM). MMM contains an extensive British food composition database and allows the user to self monitor their diet and activity in order to track progress towards a weight loss goal. A pilot study has been conducted with the aim to test the feasibility and acceptability of MMM in a sample of overweight/obese adults.

Methods: 128 overweight and obese ($\geq 27\text{kg/m}^2$) adults took part in the pilot trial for 6 months. Participants were randomised to three groups delivering the same diet and activity self monitoring intervention by MMM smartphone app, online food diary or paper food diary.

Results/findings: In the MMM pilot trial (71% female, 89% white ethnic origin, mean age 42 (SD: 9) years, mean BMI 34 kg/m^2 (SD:5)), retention rate was 93% (95% CI 81-99) in the smartphone group, 45% (30-61) in the website group, and 47% (31-62) in the paper diary group at 6 months. Adherence to dietary self monitoring was statistically significantly higher in the smartphone group with a median 82 (IQR: 28, 172) days recorded compared to 15 (IQR: 7, 45) days in the website group and 18 (IQR: 0, 37) days in the diary group ($p < 0.001$). MMM was also rated higher in terms of convenience and comfort of use in social settings.

Conclusions: MMM is an acceptable and feasible weight loss intervention.

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P3C.239

Are eating behaviours and weight status influenced by accessibility to neighbourhood food outlets in Australia? A review

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SIG: Yes, Policies and environments

Awards:

Purpose: Increasing access to healthy food outlets and restricting the availability of unhealthy food outlets in the community provide promising targets for public health policy and interventions. However, such interventions need to be underpinned by a strong evidence base. To-date there has not been a comprehensive review evaluating community food environment-diet-obesity relationships in an Australian context. These are likely to be context-specific, and international findings are not necessarily transferable to Australia. Thus, this study aimed to analyse the Australian research evidence assessing the link between community food environments, eating behaviours and weight status.

Methods: A comprehensive literature search was conducted using Ovid Medline, Austhealth/Informit, CINAHL and Web of Science databases. Studies published up to 1 September 2014 that incorporated objective measures of the community food environment and a diet or health-related outcome were included. The quality of each was reviewed, and implications for future research synthesised.

Results/findings: Eleven studies were included. The majority were conducted in Victoria ($n=9$) and all were cross-sectional. Adults were the main age group studied ($n=7$). Most studies included more than one spatial measure of food access: proximity (distance to nearest outlet), absolute density (total number of outlets), relative density (number of healthy outlets as a percentage of all outlets), availability (presence of at least one outlet) and variety (number of different food chains). Outcome variables included overweight/obesity and limited dietary assessments e.g. fruit and vegetable intake, fast food intake. Overall, there were mixed results on whether healthier eating behaviours and a lower BMI were associated with increased access to supermarkets and fruit and vegetable stores, and reduced access to convenience stores and fast food outlets. Differences in study design, measurement of outcome variables and the way food environments were characterised may have contributed to the inconsistent findings.

Conclusions: Public health policies addressing healthy food access hold great promise for large-scale public health interventions and should be high on the research agenda. Currently, there is limited Australian data on spatial access to community food outlets and diet/health. More in-depth research is needed to address the various limitations of current studies. Recommendations for future research are outlined.

P3C.240

After school and daily physical activity in adolescents with different level of physical activity in physical education lessons

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SIG: Yes, Early care and education

Awards:

Purpose: Current state of knowledge on associations between physical activity (PA) levels in physical education lessons (PELs) and after school/daily PA is limited. This study investigates after school and daily PA in adolescents with different level of PA in PELs.

Methods: The research was conducted in 29 schools in the Czech Republic (boys N = 131, girls N = 320). For the whole day participants wore the ActiTrainer accelerometer, which monitored PA and heart rate (HR). The results of the monitoring included participants who had PEL in the school day and wore the device for at least ten hours during the day. Participants were divided according to the proportion of their physical inactivity and activity in PELs into four quartile groups, the first and the fourth quartile were analyzed in this study. For statistical data processing, we used basic statistical characteristic, Kruskal-Wallis test, one-way ANOVA, cross-tabulation tables, and also effect size coefficient η^2 .

Results: There was found no significant differences in after school PA between boys and girls with different level of PA in PELs. Physically more active boys and girls in PELs reported significantly better results in daily PA compared to less active boys and girls in PELs regarding to energy expenditure, number of steps, time of physical inactivity, time of PA ≥ 3 METs, and time of $\geq 60\%$ HRmax. The recommended 11,000 steps per day were achieved by 52% of boys and 53% of girls who were more physically active in PELs compared with 34% of boys and 40% of girls who were less physically active in PELs.

Conclusion: Active lifestyle promotion strategies should address the adolescents who are less physically active in PELs. The use of ActiTrainer accelerometer facilitated the analysis of segmented school day PA.

P3C.241

Testing the feasibility of implementing a food-based rewards intervention in secondary schools (study protocol)

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SIG: No, this does not fit in any of the special interest groups

Awards:

Purpose: The diet of UK children is currently sub-optimal. Therefore, there is a need to develop effective means of encouraging young people to choose a healthier diet. Since young people spend a large amount of their day in school, this represents an ideal setting to implement interventions which aim to improve eating habits. Using rewards may be an effective method to positively influence adolescent eating behavior, but evidence regarding this approach is currently limited. Hence, the aim of the current study (entitled Eat4treats) is to test the feasibility and acceptability of a food-based rewards system in secondary schools within Northern Ireland.

Methods: Eat4treats is a non-randomised, controlled, parallel-group feasibility study. Four secondary schools (two intervention and two control; two urban, two rural) serving areas of the highest social deprivation in Northern Ireland have been recruited to take part in the trial. The study population will be Year 8 and Year 9 pupils (aged 11-13 years), as children of this age are beginning to take more control of their food selection but are not yet completely autonomous, and thus may benefit from guidance and education. The rewards element of the study will operate by allowing pupils to earn points for foods purchased at the school canteen, with better nutritional choices having the highest points value. The scheme will run for two months to allow examination of feasibility. Process evaluation outcomes will include fidelity of intervention delivery, validity of data collection and intervention engagement and acceptability. Methods for assessing outcomes that would be used in a larger scale study will be trialled. These will include collection of information on mediators and moderators of behaviour change as well as data on dietary behaviour in pupils (food offered, purchased and eaten in the canteen as well as overall dietary intake using multiple pass 24-hr recall method).

Conclusions: This study will test the feasibility and acceptability of implementing a food-based rewards scheme in secondary schools. The results will be used to make a decision on the viability of proceeding to a larger scale trial to test the effectiveness of this behavior change approach.

P3C.242

Novel multi-method approach investigating behaviour change maintenance

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SIG: Yes, e- & mHealth

Awards:

Purpose: Behaviour change, if maintained, can lead to significant health improvements. The aim of this research was to advance understanding of psychological theory of behaviour change maintenance (BCM) to inform the design of behavioural interventions to improve health. This study used a novel approach to explore BCM, with a particular focus on weight loss maintenance (WLM).

Methods: A three stage approach was taken: (1) Systematic review of behavioural theories aiming to identify theoretical explanations for BCM; (2) N-of-1 trial of WLM assessing theoretical predictors of maintained behaviour based on the systematic review of theories, employing ecological momentary assessment (EMA), Wi-Fi enabled body scales, and activity monitors, in 12 obese people who had lost at least 5% of their body weight prior to the study; (3) Semi-structured, longitudinal interviews with individuals who participated in the N-of-1 study, exploring their experiences of WLM. Interviews were data-prompted, meaning participants were presented with their personal N-of-1 trial data including weight and activity graphs, EMA data summaries, pictures, and notes. Interview transcripts were analysed using the Framework method.

Results: In the systematic review, out of 117 identified behaviour theories, 100 met the inclusion criteria of containing an explanation for BCM. The main theoretical themes underpinning BCM included: maintenance motives, self-regulation, habits, psychological resources and environmental/social influences. For the 12 participants, a range of maintenance-related theoretical variables showed differential impact on ability to maintain weight, engage in physical activity and follow a personal WLM plan. The interviews revealed that most of the theoretical explanations adequately accounted for participants' experiences. However, additional emergent themes included: competing goals, prioritising, and preparatory strategies that enhanced self-regulation.

Conclusions: The outcomes of the studies presented unique insights into maintenance theory. The conclusion from the studies is that tailored behavioural interventions are required to support individuals to maintain behaviour change and sustain weight loss. The main strengths of the research included the use of novel methods and technology. The main limitations included: analytical challenges of the N-of-1 trial and the scalability of the applied design. Future research should explore which combinations of WLM strategies, tailored to the individual, support effective WLM.

P3C.243

Alterations in metabolic health and inflammation following diet, exercise or combined behavioral interventions based on Social Cognitive Theory: A randomized, controlled trial.

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SIG: Yes, Socioeconomic inequalities

Awards:

Objective: Interventions including dietary counseling may be advantageous for youth whose extreme obesity limits mobility and causes discomfort, preventing them from exercising safely and effectively. We examined the benefits of a behavioral intervention including diet, exercise or both to metabolic health and systemic inflammation in obese black adolescent females.

Methods: Obese [body mass index (BMI)=38.44+/-6.73] black adolescent [Age=5.65+/-1.85; 13-19 years] females were randomized to diet only [DIET(N=19)], exercise only [EXER(N=17)], or waiting list control [CON(N=17)] followed by diet plus exercise [DIET+EXER(N=17)] conditions. All treatment participants received a 10-week [(wk)1x/week, 1.5-2-hours], clinic-based, culturally-tailored behavioral intervention based on constructs of Social Cognitive Theory [SCT]: Mastery, Physiologic Feedback, Role-modeling, Knowledge Transfer, including specific recommendations for improving physical activity and nutrition at home. The DIET component included a hypocaloric diet [non-ketogenic, high-protein-modified fast, supplemented with multivitamins, plus calcium+vitamin D and potassium]. The EXER component included a weekly 45-minute moderate-intensity exercise session tailored to weight status. Body composition [weight, waist circumference, BMI (kg/m²) for gender-age-z-score, total body fat(TBF), lean body mass(LBM), bone mineral content (DXA)], lipids [total cholesterol, high/low density lipoproteins], glycated hemoglobin [HbA1c] and inflammatory parameters [Interleukins (IL)6, IL8, TNFα, C-Reactive Protein (CRP), adiponectin, resistin] were measured at baseline and follow-up [Linear regression on differences, baseline as covariate; Tukey]

Results: Significant reductions in TBF were observed in DIET+EXER(p<0.05) versus EXER, while LBM was significantly increased in DIET+EXER versus CON(p<0.05) groups. All other metabolic and inflammatory parameters did not differ between groups. However, when groups were examined individually, IL8 was decreased in DIET+EXER(p<0.0002) and CRP was increased in both EXER(p<0.01) and DIET+EXER(p<0.008) groups. Overall retention by DIET(84%) was higher than EXER(70%) and DIET+EXER(75%) groups. Attendance in EXER(70%) was lower than DIET(84%) and DIET+EXER(83%) groups.

Conclusion: Only a combined 10-wk intervention of behavioral counseling based on SCT, and diet plus exercise was of sufficient intensity and appeal to promote adherence and a significant improvement in body composition. Fat loss promoted by diet may provide the necessary stimulus to motivating obese black adolescent females to continue exercise for long enough durations to improve body composition. Alterations in inflammation following diet versus exercise are in need of further investigation.

P3C.244

Association of body mass index and abdominal adiposity with cognitive function and functional status in the elderly.

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SIG: Yes, e- & mHealth

Awards:**Purpose:**

To examine the association between body composition, functional status and cognitive function in the elderly, including potential gender differences.

Methods:

A total of 145 elderly (Age 81.1±9.3 years; Weight 66.2±14.4 Kg; BMI 27.5±5.5 Kg/m²), were volunteers. Abdominal bioelectrical impedance analysis and waist circumference (WC) was measured using the ViScan (Tanita Corporation). In addition, anthropometric measurements were performed. BMI and waist-hip ratio (WHR) were calculated using classical equations, and sagittal abdominal diameter (SAD) as abdominal adiposity markers. Cognitive function was evaluated through the Mini-Examination Cognitive (MEC) score and functional status was measured using the Barthel Index. The Kendall-Tau and Spearman rank correlation coefficient were used to explore associations between variables.

Results/findings:

Barthel score was positively associated with weight (Kendall T = 0.12, P<0.05) and BMI (Rho = 0.03, P>0.05), and inversely with age (Rho = -0.33, P<0.01). WC, WHR and SAD were not significantly associated with Barthel score. No significant gender differences were found between variables. MEC score was positively associated with BMI, SAD and WC (Rho = 0.19; Rho = 0.17, P<0.05; Rho = 0.22, P<0.01, respectively), visceral fat and gluteus perimeter (Kendall T = 0.17 both, P<0.05), and inversely with age and WHR, not significantly. These associations were strengthened in women.

Conclusions:

Our results suggest that high BMI and prevent weight loss could be a positive factor for physical functioning level and a protective factor for dementia in the oldest old. In this observational study, visceral fat were associated with decreased risk of developing dementia, but not with functional status. A plausible explanation should be higher BMI and weight might be related with higher lean mass. However, when the analysis was performed, separated by gender, this association was observed only in women for dementia. In view of the fact that loss of lean tissues occurs exponentially with aging, promotion of physical activity programs targeted at weight maintenance would be important.

Acknowledgments:

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P3C.245

Mapping and Evaluation of Physical Activity Interventions for School-Aged Children in Southampton. A Pilot Study

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SIG: Yes, e- & mHealth

Awards:

Purpose: Around 28% of children in England aged 2-15 are now classified as either overweight or obese, yet a high degree of de-regulation, organisational fragmentation and funding cuts throughout UK schools in recent years has potentially obscured the definitive structure and effectiveness of physical activity (PA) provision offered to children. This pilot study subsequently aimed to map the structure and context of PA provision offered to children in Southampton, and its alignment with empirical evidence.

Methods: The study focused upon school-based PA provision, since this was conjectured to show greater diversity and lend itself to further interventions than non-school PA provision. Utilising a qualitative approach, interventions offered across 8 schools (3 junior, 2 primary, 4 secondary) were investigated and mapped through semi-structured interviews. Findings were benchmarked against other cities similar to Southampton in IMD status via interviews with city council workers.

Findings: Interviews highlighted only three formal PA specific interventions currently operating, and a hand full (<10) of informal interventions, as defined by program frequency and organisation. Limited PA provision was attributed to, a lack of time, money, and priority devoted towards PA within schools. Considerable disparity exists between the high prevalence of sport-oriented provision compared with the low prevalence of PA specific provision. Key findings from interviews with Portsmouth and Bristol city council suggest that such findings may not be unique to Southampton.

Discussion: In stark contrast to the extensive literature base detailing numerous PA interventions in schools-aged children, our data suggests that a very small amount of such knowledge and provision appears to translate into everyday life in Southampton schools. Our data highlights a significant discrepancy between sport and PA provision across schools. It is possible that the inability to successfully differentiate between sport and PA may present a further obstacle to the successful uptake of PA in the future. This is supported by literature suggesting competitive and highly structured activity is regularly quoted as a barrier to participation, whereas unusual activities, social support and weight management are quoted as motivations. Recommendations based on this work are proposed.

P3C.246

Will a Physical Activity Based Food Label-System Change Activity Behavior?Yvonne Schroeder¹, Martin Kopp²¹University Vienna, Faculty of Business, Institute of Finance, Vienna, Austria, ²University of Innsbruck, Department of Sport Science, Innsbruck, Austria**SIG:** Yes, Policies and environments**Awards:****Objective:** Effectiveness of a physical activity (PA) based nutrition format is tested on various food items consumed throughout the day, aiming to understand PA format's effect on intentions to increase level of PA.**Methods:** Students and employees of 48 universities across Austria and one in Berlin were invited to participate in an online survey. Random assignment into one of two groups; randomized group received quiz about energy balance and effect of excess energy intake on weight gain. Both groups (n=478) received 11 sample meals; first without nutritional information, then with PA format showing how many minutes would need to be run or biked to expend the food's energy.**Results:** 62.9% of women (m: 47.2%) with BMI > 25, 52.6% of women (m: 33.3%) with BMI < 25, 59% of consumers very/unsatisfied with their weight (43.7% very/satisfied), 47.9% of consumers who do not exercise for enjoyment, and 44.7% of women (m: 31.3%) engaging in very/light levels of leisure time PA and 58.3% of women (m: 35.4%) who are very/active reported of increased intentions to engage in PA. Keeping track of daily energy intake, engaging in weight control and level of weight satisfaction are significant factors predicting influence of PA format on intentions of subsequent PA. 60.6% of women (m: 44.7%) totally/agreed that such PA format would lead to choosing lower PA intense food items; particularly consumers engaged in weight loss (71.6%) or weight maintenance (51.8%).**Conclusion:** PA based food format may be a supportive public health intervention by reducing sedentary lifestyle. It may be an opportunity and potential strategy to increase society's level of PA particularly among women and consumers struggling with weight control. Lastly, it can contribute to a better understanding of energy balance.

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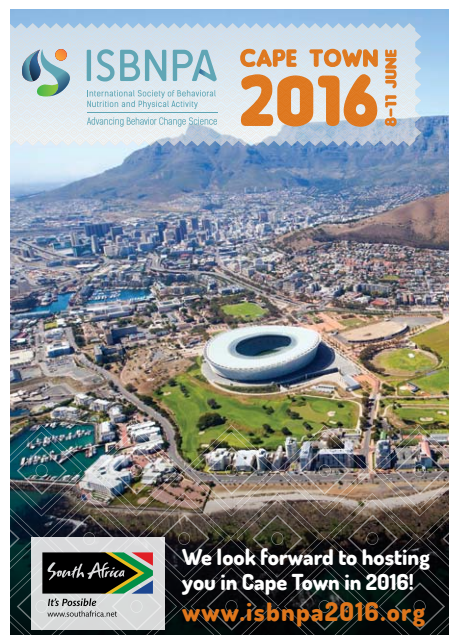
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Author Index

Name	Presentation Code
Aşçı, Hülya	S6.3.4
Aadahl, Mette	P2.198, P2.214 , P3b.150
Aalborg, Annette	P2.79
Abbott, Gavin	O3.1.3, O6.1.4, P2.112, P3b.148, SO2.1.4
Abdelwahab, Manal	SO1.3.7
Abdi, Sarah	P1.21
Ablah, Elizabeth	P1.85 , P3.95
Abraham, Charles	O2.2.1
Abrales, Arturo	P0.25
Abreu, Sandra	P0.133
Absetz, Pilvikki	P3C.223
Abula, Kahaerjiang	P2.18Q
Abusnana, Salah	P1.21
Ackermann, Ranelda	P2.81
Adab, Peymane	O3.3.3, O9.3.3 , P1.93 , P2.224, P3.51, SO5.4.6
Adam, Khalid	SO4.2.1
Adams, Alexandara	P3.78
Adams, Alexandra	P3.80 , P3b.90
Adams, Emma	P1.112, P1.119, P1.127 , P2.105
Adams, Ingrid	P1.13, SO1.4.1
Adams, Jean	O2.2.1, P2.16 , P2.20, P2.21
Adams, Marc	S1.1.3, SO2.4.1 , SO7.4.4
Adamson, Ashley	O2.2.1, P1.53, P2.1, P2.20, P2.21, P2.22, P3C.230, S2.6.3
Adamson, Ashley J	P2.16
Adamsons, Kari	S6.2.2
Adams, RC	S8.1.3
Addington, Renae	P2.52
Adile, Adimchi	P3.5
Adlakha, Deepti	SO4.2.1
Afonso, Carla	P0.28
Aggio, Daniel	O5.3.1, P1.110, P1.190 , P2.195
Agho, Kingsley	P3.123
Agondi, Rubia	P1.63
Agostinis, César	P0.133
Agrawal Pedulla, Tara	S7.5.1
Aguiar, Elroy	P3.57
Agurs-Collins, Tanya	P0.192
Ahmed, Huda	SO4.2.1
Ahmed, Selena	P2.56
Ahola, Riikka	P3C.169, SO4.4.1
Ahrens, Wolfgang	O6.2.1, S1.6.1, S4.6.2
Ainsworth, Hannah	P1.116
Aittasalo, Minna	P3.127, P3C.202
Ajja, Rahma	P1.115
AL ALMUDAHKA, FUAD	P3.93
Albar, Salwa	P0.143
Alberico, Claudia	P0.101
Albuflasa, Abdulla	P3.104
Alfonso Rosa, Rosa	P3.112
Alghafri, Thamra S	P2.97
Alhassan, Sofiya	SO3.4.2
Ali, Samia	P1.21
ALKHUDHAYRI, DALAL	P2.165
AL-KUWARI, MOHAMED	P1.114
AL KUWARI, MOHAMED	P3.93, P3.98
Al-Kuwari, Mohamed G	P3.104
Al-Kuwari, Mohamed Ghaith	P2.74 , P2.90
Alleman, Gayle	P2.76, P3b.86
Allen, Corliss	O5.2.4
Allender, Steven	O1.4.6, P3b.157
Allen, James	P2.31
Allen, Jennifer	P3C.176
Allen, Raymond	SO1.3.7
Alley, Stephanie	P1.189, P3.111

Name	Presentation Code
Allman-Farinelli, Margaret	O1.1.3, P1.15, P1.228, P2.2, P2.23, P2.32, P3.55, P3C.179, SO4.1.3, SO9.2.2
Almeida, Mariana	P0.154, P0.50
AL-MOHANNADI, ABDULLA	P1.114
Al-Mohannadi, Abdulla Saed	P2.90
Almudahka, Fuad	P3.98
Al-Nakeeb, Yahya	P2.156, SO2.4.2
Alnuaim, Anwar	SO2.4.2
ALOBOUDI, LATIFAH	P2.165
AlSiyabi, Huda	P2.110
AlSubhi, Mossa	P2.110
Altenburg, Teatske	P0.163, P1.186, P3.40 , S6.6.2, S6.6.3
Alvarado, Miriam	S3.2.3
Alvarez Balbosa, Francisco	P3.112
Álvarez-Gallardo, Inmaculada C	P0.108
Álvarez, Octavio	P0.74
Alvero-Cruz, José Ramón	P3C.244
Alwan, Nisreen	P0.143
Ambrosini, Gina	P3C.184 , P3C.239
Aminian, Saeideh	S3.5.4
Amini, Zahra	P1.16
Amireault, Steve	P0.60
Ammerman, Alice	P2.10
Amougou, Norbert	P0.99
Amstrong, Miranda	P0.159
Anantharaman, Saradha	P2.209
Anastasiou, Costas	P0.168
Andaki, Alynne	P3C.193
Andersen, Henriette	P2.82
Andersen, Henriette Bondo	S7.74
Andersen, Lars B	P2.93
Andersen, Lene	P0.163
Andersen, Lene, F	S1.6.1
Anderson, Annie	P0.122, P3b.82 , SO6.4.8
Anderson, Annie S	P2.97
Anderson Steeves, Elizabeth	P0.29 , S7.1.1
Andrade, Susana	S4.1.3
., and the DEDIPAC consortium	SO1.3.2
Angstrom, Heather	S3.6.3
Anitha, Chandrasekaran	P0.14
Anjana, Ranjit Mohan	P0.14
Anjana, RM	P1.140
Antunes, Marta	P0.40
anwar, fahmina	P0.6
Anzman-Frasca, Stephanie	P0.10 , S3.6.3
Aparicio, Virginia A	P0.108
Apolzan, John	SO1.3.7
Appleton, Katherine	P0.20, P1.65 , P3C.212
Appleton, Paul R	O3.2.2
Araujo-Soares, Vera	P2.188, P2.20, P3C.223
Araújo-Soares, Vera	P1.53
Arcan, Chrisa	S5.1.1
Areta, Aufai	S7.1.3
Aridi, Yasmine	P0.1
Arnaud, Amandine	P3.15, P3b.83
Arnold, Josh	P0.59
Arrogi, Anass	SO4.4.6
Ars, Charlotte	P2.19 , P2.47
Arundall, Lauren	S7.34
Arundell, Lauren	P2.213 , SO9.4.3
Asaad, Ghada	P1.61
Ashe, Maureen	P1.149, P1.177, P2.125
Ashe, Maureen C	O5.3.4
Ash, Sarah	SO6.2.3
Ashton, Lee	P2.70

AUTHOR INDEX A – B

Name	Presentation Code
Astell-Burt, Thomas	O5.1.1, O5.1.2, O5.1.3, <u>O5.3.3</u> , <u>P1.205</u> , P2.132, P2.43, P3C.217, SO2.4.7
Ata, Nicole	P3.39
Atkin, Andrew	<u>P2.186</u> , S7.3.1
Atkin, Andy	S5.7.3
Atkinson, Lou	<u>P3.14</u> , P3.72
Attwood, Sophie	<u>P0.109</u>
Aubé, Isabelle	P0.149
Autran, Roseanne	<u>P2.155</u>
Aveyard, Paul	SO5.1.2
Awele, Iwelumor	P3.43
Awick, Elizabeth	O2.3.4, P2.149
Awotidebe, Adedapo	P0.159, P0.63
Ayton, Darshini	P0.158
Azar, Kristen	O1.1.4
Baba, Camila	P0.154
Baccini, Marco	P3.133
Backerra, Vivian	<u>P0.141</u> , P0.142
Backholer, Kathryn	SO2.2.1
Backhouse, Susan H	P1.60
Badland, Hannah	O5.1.2, O5.1.3, P2.43, <u>S7.2.3</u> , <u>SO2.4.7</u> , SO4.2.2, SO4.2.3
Badura, Petr	P1.162, P1.197
Baggio, Adriana	P2.36, P2.37
Bailiff, Sarah	SO4.1.1
Baillie, Colin	<u>P3.143</u> , <u>SO8.4.5</u>
Baillie, Colin PT	<u>P0.149</u>
Baird, Janis	<u>P3b.34</u> , SO2.1.4
Baker, Amanda	O1.4.2
Baker, Colin	P0.164
Baker, Graham	P0.137, <u>P0.66</u> , <u>P3C.186</u>
Baker, Phillip	O1.3.1
Baker, Samantha	O9.3.2, O9.3.4
Bakers, Japie	<u>P2.141</u>
Bakker, Ingrid M	O3.3.2
Balaguer, Isabel	SO1.1.2
Balakrishna, N	O6.1.5
Bald, Melinda	P0.19
Balemans, Astrid	P2.197
Balestracci, Kate	P1.15, SO9.2.2
Balgopal, Meena	P2.52
Ball, Kylie	O3.1.3, O6.1.4, P0.186, P1.48, P2.222, P3.11, P3.125, P3.9, P3b.148, S1.4.1, S3.3.1, SO2.1.1, SO2.1.2, SO2.1.4
Bambra, Clare	P0.169
Bandinelli, Stefania	P2.189, P3.133
Bangay, Shaun	S6.1.4
Banks, Emily	P1.204, P2.184
Banna, Jinan	<u>SO7.4.8</u>
Bann, David	P2.117
Banting, Lauren	P0.79, <u>P1.94</u> , P3.126
Bantum, Erin	P3.45
Baquedano, Mai	<u>P0.87</u>
Baranowski, Janice	P1.5, <u>S2.4.1</u> , SO1.3.5
Baranowski, Tom	P0.30, <u>P1.47</u> , <u>P1.5</u> , S2.4.1, S2.4.3, <u>SO1.3.5</u>
Barberio, Amanda	<u>S8.3.2</u> , S8.3.3
Barber, Sally	P0.132, P0.92, P1.116, P1.206, P1.212, <u>P2.77</u> , P3C.198, <u>S3.5.1</u> , SO5.2.1
Barbey, Jana	P1.1, S7.6.3
Barco Leme, Ana Carolina	<u>P1.71</u> , <u>P2.219</u>
Bardos, Helga	O6.2.3
Baril, Gérald	SO3.2.2
Barker, Mary	P3b.34
Barling, Julian	S7.3.2
Barnes, Alyce	S6.2.3
Barnes, Joel	P2.160

Name	Presentation Code
Barnes, Rosanne	<u>P1.177</u>
Barnett, Anthony	P3.71, S9.5.2
Barnett, Lisa	O1.4.6, P3.97, P3b.149, P3b.157, S2.7.4, S9.1.4
Barquera, Simón	P2.130
Barr-Anderson, Daheia	P3b.152
Barreira, Tiago	<u>O6.1.1</u>
Barrett, Timothy G	O3.2.2
Barriera, Tiago	SO8.2.2
Barr, Michelle	<u>O8.1.1</u> , P1.35
Barros, Mauro	P0.194
Barroso, Cristina	O4.2.1
Barry, Sarah	P0.122
Bartos, Sebastian	P3C.234
Basen-Engquist, Karen	P1.173, P2.126, P3.135
Bassett, David	P3C.172
Basterfield, Laura	P3C.230
Basu, Semonti	O3.3.1
Batalau, Rui	P0.145, <u>P0.44</u> , P3C.205
Batterham, Alan M	<u>S1.2.1</u>
Battersby, Sarah	S3.3.2
Battjes-Fries, Marieke	<u>O2.1.3</u>
Bauman, Adrian	O1.1.3, O1.3.3, P0.131, P0.181, P1.204, P1.228, P2.161, P2.184, P2.202, P2.211, P2.215, P3C.179, S3.4.1, S6.3.3, SO6.2.4, SO8.2.1, SO8.2.3, SO8.4.8, SO9.2.2
Baum, George	P1.173
Baur, Louise	S3.4.1
Bearne, Lindsay M	P1.154
Beauchamp, Alison	SO2.2.1
Beauchamp, Mark	P1.111, S7.3.2
Beaudoin, Charlotte	P3C.216
Beaumont, Lee	<u>P3.136</u> , <u>P3.137</u>
Beck, Ashley	P1.43, P1.50
Becker, Daniela	<u>S8.1.2</u>
Beck, Fay	P0.87
Beets, Michael	P1.115, S3.6.3, S6.5.3, SO7.4.2
Bégin, Catherine	O8.3.3, O8.3.5, P1.224, P1.231, P2.233
Behm, David	P3C.218
Belanger-Gravel, Ariane	<u>P0.78</u>
Bélanger-Gravel, Ariane	<u>SO1.1.4</u>
Belanger, Lisa	P0.116
Bélanger, Mathieu	P1.159
Belcher, Britni	<u>SO9.4.6</u>
Bell, Bethany	P3C.181, S3.3.2
Bell, Colin	P0.19
Bellicha, Alice	<u>P1.145</u>
Bell, Joshua A	<u>P3C.182</u>
Bell, Lucinda	<u>P0.183</u> , <u>P0.33</u>
Bellows, Laura	<u>O3.1.2</u> , P2.51
Bell, Ruth	P2.118
Bel-Serrat, Silvia	P1.73, S1.6.1, <u>SO6.4.2</u>
Belton, Anne	P0.14
Belton, S	P2.101, P2.102
Belton, Sarahjane	P2.140, P2.173, P3b.153, <u>SO1.1.1</u> , SO5.2.3
Beltran, Alicia	P0.30, P1.5
Ben Abdelaziz, Faten	<u>S2.1.3</u>
Benade, Leon	S3.5.4
Benden, Mark	<u>S3.5.3</u>
Benítez-Porres, Javier	<u>P3C.244</u>
Ben Meftah, Jamila	P1.89
Bennie, Andrew	O5.1.1
Bennie, Jason	P0.79, P1.94, P3.126, <u>P3b.163</u>
Ben Rebah, Maher	O6.2.3
Ben-Shlomo, Yoav	O6.2.1
Bentley, Georgina	<u>P0.112</u>
Bentley, Rebecca	O4.3.2, SO1.4.4

AUTHOR INDEX B

Name	Presentation Code
Benwell, Ann	SO9.2.1
Bere, Elling	O1.4.5, P1.139, P1.30, P1.7, P3.117, <u>SO6.1.3</u>
Berendsen, Brenda	P1.95, SO2.2.4
Berge, Jerica	<u>O6.2.2</u> , <u>P0.15</u> , <u>SO7.4.6</u>
Bergeron, Pascale	O6.3.5
Berg, Jonathon	P3b.82
Bergström, Helena	S8.6.2
Berkman, Lisa	S5.5.4
Berlin, Anita	P2.63
Bernard, Jonathan	P0.99
Bernstein, Shanna	SO9.4.6
Berntsen, Sveinung	<u>P1.139</u>
Berrigan, David	SO9.4.6
Berry, Tanya	P0.119, P0.189, P1.113, <u>P1.131</u> , <u>P1.84</u> , P3b.168, SO3.4.5
Bersamin, Andrea	S7.1.3
Bertenshaw, Emma J	<u>PQ.97</u>
Bertz, Fredrik	P0.71
Besenyi, Gina	S6.1.1
Bethany, Bell	SO4.1.2
Bethlehem, John	O6.2.3
Beyer, Nina	<u>P2.185</u>
Beyl, Robbie	SO3.2.3
Bhatnagar, Prachi	<u>P1.143</u> , <u>P2.139</u>
Bhavadharini, Balaji	P0.14
Bherer, Louis	P3C.177
Bhopal, Raj	P0.85
Biddle, Stuart	P0.187, P0.79, P0.93, P1.94, P2.190, P3.126, P3C.220, <u>S1.2.2</u> , S4.6.3
Biddle, Stuart JH	P0.42, P2.199, P2.200
Biertho, Laurent	P2.233
Bilger, Marcel	P0.105
Bingham, Daniel	P0.132, P1.116, <u>P1.212</u> , P3C.198, S3.5.1, <u>SO5.2.1</u>
Birch, Leann	P3b.88
Birch, Samantha	P1.81
Bissonnette, Véronique	<u>P3C.231</u>
Biyoow, Ifrah	P0.126, P0.182
Bjelland, Mona	<u>O1.4.5</u> , P2.205, P2.33
Bjørnarå, Helga Birgit	P1.30
Blackburn, Patricia	P1.225, <u>P3.120</u>
Black, Maureen	<u>O6.1.5</u> , SO5.2.2
Blaha, Ladislav	P1.179
Blaine, Rachel	S4.7.1
Blair, Steven	P2.212
Blake, Christine	P2.55, P3.52, S4.7.1, SO4.1.2
Blakely, Tony	S5.6.1
Blanchard, Chirs	P0.173
Blanchard, Chris	<u>P1.202</u> , P2.174, P2.95, P3C.232, P3C.236, SO4.4.4
Blanchette, Sébastien	P0.170
Bleazard, Louise	S8.6.1
Blizzard, Leigh	O6.2.6
Bloch, Paul	<u>P2.193</u>
Block, Clifford	<u>O1.1.4</u>
Block, Gladys	O1.1.4
Block, Torin	O1.1.4
Blouin, Chantal	P1.100
Blundell, John	O1.3.2
Boadu, Isaac	<u>PQ.4</u>
Boddy, Lynne	<u>O7.1.2</u> , P0.175, P1.138, P2.133, <u>S7.3.3</u>
Boelsen-Robinson, Tara	<u>SO2.2.1</u>
Boen, Filip	O2.3.5, O3.2.1, P2.89, SO4.4.6, <u>SO6.2.1</u>
Bogaerts, An	<u>O2.3.5</u> , P2.89, SO4.4.6
Bogomolova, Svetlana	<u>P2.24</u>
Bøker Lund, Thomas	S7.5.3
Boles, Cody	S2.2.1

Name	Presentation Code
Boles, Richard	O3.1.2, P2.51
Bolger, Linda	P2.142
Bolger, Lisa	P2.142
Bolman, Catherine	P0.107, S2.2.2, SO4.4.7
Bonfiglioli, Catriona	P2.211
Boonzajer Flaes, Saskia	<u>P2.121</u> , <u>S2.5.3</u>
Booth, Josephine N	<u>SO3.4.4</u>
Booth, Lorna	P1.9
Booze, Rosemarie	O5.1.5
Borch, Kristin Benjaminsen	<u>P3C.196</u>
Bordes, Isabelle	P0.155
Bore, Arnaud	P3C.177
Borgen, Iren	P3.47
Börnhorst, Claudia	O6.2.1
Borraccino, Alberto	P1.162, P3.115
Boruff, Bryan	O5.1.2, O5.1.3, SO2.4.5
Bos, Marieke B	P1.89
Botton, Jérémie	P2.15, SO9.4.8
Bouchard, Claude	O1.3.4
Bouchard, Louis	P3b.89
Boulares, Hamid	<u>P3C.243</u>
Bourgeois, Jan	O4.1.4
Bourke, Liam	S9.3.3
Boushey, Carol	P1.56
Bowling, J Michael	O8.3.2
Bowrey, David	P0.42
Boyland, Emma	<u>S3.4.1</u> , <u>S3.4.2</u>
Boyle, James M E	SO3.4.4
Braaten, Tonje	P3C.196
Bracken, Richard	P0.102
Bradley, Eddie	<u>P3.102</u>
Brady, Sheila	SO9.4.6
Braeckman, Lutgart	P1.157
Braet, Caroline	O5.2.6, S8.2.1, SO6.4.6
Brage, Soren	P2.186
Brainard, Carrie	P3.138
Brand, Christian	P2.192
Brannen, Julia	S7.5.2
Brantley, Phillip	<u>SO3.2.3</u>
Braun, Abbe	P3b.90
Braun, Kathryn	S7.1.3
Brawer, Rickie	P0.3
Bredahl, Thomas	P0.38
Breda, Joao	S3.1.1
Breidenassel, Christina	P1.233
Breitenbach, Zita	P0.114
Brekke, Hilde Kristin	P0.71
Brennan, Deidre	P2.191
Breslin, Gavin	P0.100, P2.140, P2.191
Bricker-Jones, Margaret	P3.70
Briggs, Adam	<u>S5.6.3</u> , S5.6.4
Brikou, Dora	P0.168
Briley, Margaret	P1.33, <u>P2.58</u> , SO1.3.8
Briley, Margaret E	SO7.4.5
Brinkmann Løite, Vibeke	P0.38
Brinsden, Hannah	<u>P2.11</u> , <u>P2.18</u>
Brismar, Kerstin	P3.130
Brittain, Danielle	<u>P2.92</u> , P3.92
Britton, Annie	O4.1.2, P2.202
Brlacic, Hrvoje	P3C.214
Broad, Michelle	SO4.4.8
Brock, Ricky	SO3.2.3
Brondeel, Ruben	<u>O7.1.1</u>
Brookes-Howell, Lucy	P2.226
Brown, Clarissa	S3.6.3
Brown, Helen	<u>P2.183</u> , S7.3.4

AUTHOR INDEX B – C

Name	Presentation Code
Brown, Helen Elizabeth	P1.134, P2.35
Brown, Jubilee	P1.173
Brown, Katherine	S2.4.2
Brown, Onikia	O4.3.5
Brown, Tamara	P0.169, <u>P0.85</u> , P2.21, <u>P2.22</u>
Brown, Tom	P3C.201
Brown, Trent	P1.121
Brown, Wendy	O5.3.2, P0.174, P0.58, P0.81, P1.146, P2.187, P2.68, P3b.156, <u>SO5.1.2</u> , SO9.4.5
Brown, Wendy J	P1.221, <u>S2.3.2</u>
Broyles, Stephanie	O6.1.1, SO8.2.2
Bruce-Low, Stewart	P0.59
Bruening, Meg	P2.65, SO7.4.4
Brug, Johannes	O1.4.5, O6.1.4, O6.2.3, P2.124, P2.215, P3b.91, S9.3.2, S9.3.4, SO8.4.1
Brumbley, Danielle	P0.147
Bruner, Mark	S7.3.2
Brunet, Jennifer	O3.2.3, O3.2.5, P1.159
Brunner, Eric	O4.1.2, P2.202
Brussoni, Mariana	P1.195
Bruton, Yasmeen	S4.7.1
Bryant, Alexandra	P3b.90
Bryant, Elizabeth	P0.65
Bryant, Maria	P2.77
Buchan, Carole	P0.122
Bucher, Tamara	O5.2.3, P1.1, S7.6.3, <u>SO7.2.2</u>
Buck, Christoph	O1.2.2, S1.3.4
Buckingham, Lyndi	P0.32, <u>SO6.1.2</u>
Buckley, Hannah	P1.116
Buckley, Jon	P2.24
Buckley, Julia	O8.1.5
Bucksch, Jens	P1.162, P2.145, <u>P3.115</u>
Buday, Richard	P0.30
Buffart, Laurien	S9.3.2, <u>S9.3.4</u>
Bukman, Andrea J	<u>P1.89</u>
Bulgiba, Awang	P1.106
Buliung, Ron	P1.150, P3.118
Bull, Fiona	P3C.239, S9.2.2, SO1.4.6, SO2.4.5
Bullock, Sally	SO2.1.3
Buman, Matthew	S3.2.2, SO1.2.2
Bunn, Chris	P2.170, <u>P3.48</u>
Buote, Richard	P0.116, <u>P3C.218</u>
Burdorf, Alex	P2.107
Burke, Shauna	O3.1.1, P1.111, <u>P1.92</u> , P3.17
Burke, Shaunna	<u>P1.151</u>
Burley, Victoria	<u>P3C.238</u>
Burlutsky, George	SO3.2.4
Burns, Con	P2.142
Burrowes, Tracy L	S3.6.2
Burrows, Raquel	P1.117, P1.18
Burton, James	P3.108
Burton, Lindsay	S6.1.2, S8.7.3
Burton, Nicola	P1.146, P1.200, P2.100, P2.187, S2.2.1, SO9.4.5
Busschaert, Cedric	<u>S2.7.1</u>
Butson, Michael	P3b.149
Bütterich, Annekatrin	P1.90, P3.13
Byker, Carmen	<u>P2.56</u>
Byrd-Bredbenner, Carol	<u>P1.44</u> , P1.72, P2.76, <u>P3.65</u> , P3b.86
Byrd, Doratha	P0.192
Byrd-Williams, Courtney	P2.58, SO7.4.7
Byrd-Williams, Courtney E	SO7.4.5
Byrne, Nuala	O8.3.4, P2.75, P3.119, P3.62
Byrne, Rebecca	P2.25
Cabanas-Sanchez, Veronica	P1.160
Cabanas-Sánchez, Verónica	P2.166
Cabrita, Paulo	P0.44

Name	Presentation Code
Cade, Janet	<u>P0.143</u> , P3C.238
Cade, Janet E	O9.3.3
Cain, Meagan	P2.92
Cairney, John	P3.132
Cai, Yun	P3.99
Caldeira, Sandra	P3b.25
Caldwell, Linda	P1.106
Caldwell, Linda L	P1.171
Cale, Lorraine	P3C.220
Callaghan, Mary	P1.38
Callary, Bettina	P3C.216
Callister, Robin	O1.1.1, <u>O1.4.2</u> , O3.2.4, P1.226, P1.227, P3.57, P3b.85, P3C.176
Calloway, Eric	<u>P1.33</u> , <u>P2.30</u> , <u>SO1.3.8</u> , <u>SO4.1.4</u>
Camargo, Taís	P0.60
Cameron, Cate	P1.52
Cameron, David S	P0.97
Cameron, Noel	P1.206
Camiletti-Moirón, Daniel	P0.108
Campbell, Christina	<u>P0.32</u> , P3.64, SO6.1.2
Campbell, Elizabeth	P1.120, P1.153
Campbell, Karen	O3.1.3, P1.29, P2.222, P3.7, P3b.148, S6.5.1, <u>SO7.4.1</u>
Campbell, Libby	O6.1.3, P3b.158
Campbell, Nerissa	<u>P0.173</u> , <u>P3C.232</u>
Campbell, Norm	S8.3.2, S8.3.3
Campbell, Rona	SO5.4.3, SO5.4.4
Cannings-John, Rebecca	P2.226
Cantin, Melynda	O8.3.1
Caperchiona, Cristina	SO4.4.8
Caperchione, Cristina M	P2.164, <u>P3.70</u>
Caplette, Marie-Ève	P3C.231
Capranica, Laura	S1.6.2
Carbonneau, Elise	O8.3.1, <u>O8.3.5</u>
Carbonneau, Noemie	<u>O8.3.1</u>
Cardona Cano, Sebastian	SO6.4.7
Cardon, Greet	P0.17, P1.186, P2.67, P3.114, S1.3.1, S1.3.3, S1.3.4, S1.4.2, S1.6.2, S2.2.3, S2.5.1, S2.5.2, S2.7.1, S5.1.2, S5.2.3
Cargo, Margaret	P0.149
Carins, Julia	<u>P1.54</u>
Carlin, Angela	<u>P2.162</u>
Carlisle, Taran	P1.156, P1.168, <u>P3.139</u>
Carlson, Andrea	<u>S3.1.3</u>
Carmack, Cindy	P1.173, P2.126
Carnes, Fei	O1.2.6
Caro, Elsje	P3.40
Carraça, Eliana	P0.176, P0.40, P1.118
Carraça, Eliana V	P0.13
Carrad, Amy	<u>P2.14</u> , <u>P3.2</u>
Carraway-Stage, Virginia	<u>P1.28</u> , <u>P1.86</u>
Carrillo, Kristen	O8.1.2
Carson, Brian	P0.178
Carson, Val	P2.160
Carson, Valerie	<u>P0.162</u> , P1.131, <u>P1.188</u> , P3b.160
Carter, Michelle	P3C.238
Carter, Patrice	P0.42
Caruso, William	P2.24
Carvalho de Oliveira, Renata	P0.11
Carver, Alison	P3.114, S1.4.1
Cary, Miranda	P2.92
Cash, Catherine	P0.186, S5.7.4
Casini, Annalisa	P1.157
Casini, Leonardo	S7.6.2
Caspi, Caitlin	S3.3.3
Cassidy, Dunla	S4.3.1
Castillo, Isabel	P0.74, S8.5.2
Castro, Cynthia	P2.87

AUTHOR INDEX C

Name	Presentation Code
Castro-Piñero, Jose	P2.166
Caswell, Stephen	P3b.82
Caterson, Ian	O8.3.4
Caulfield, Laura	SO5.2.2
Caum, Carme	P3.15, P3b.83
Cerin, Ester	P2.203, P3.71, S1.1.1, S1.1.2, S1.1.3, S1.1.4, S5.7.4, S7.3.4, S9.5.2, S9.5.3, SO2.1.1, SO2.1.2, SO2.4.1, SO8.4.2, SO9.4.3
Cetateanu, Andreea	<u>P1.83</u>
Chabot, Guylaine	<u>P0.193</u>
Chad, Karen	P2.163
Chaix, Basile	O7.1.1, <u>S7.2.2</u>
Chaloupka, Frank	O8.1.3, S5.6.2
Chamberland, Karine	<u>P0.190</u>
Chambers, CD	S8.1.3
Chambers, Fiona	P2.191
Chambers, Stephanie	<u>SO6.4.1</u> , <u>SO6.4.8</u>
Champagne, Catherine	SO3.2.3
Chanal, Julien	<u>P1.209</u>
Chan, Catherine	P1.61
Chan, Choi Wan	P3.3
Chandler, Jessica	SO7.4.2
Chang, Chih-Jen	P1.125
Chang, Debbie	P1.88, S6.5.3
Chang, Julie	P3.68
Chang, Rowland	O4.1.3
Chang, Yen-Jung	<u>P2.120</u>
Chang, Yin-Fan	P1.125
Chan, Hiu Nam	P3.55
Chaparro, M Pia	<u>P3.8</u> , SO6.1.1
Chapman, Jim	O4.3.3
Chapman, Justin	P1.146, P2.187, <u>SO9.4.5</u>
Chapman, Kathy	P2.71, P2.9, S3.4.1
Chaput, Jean-Philippe	<u>O1.3.4</u> , SO8.2.2
Charity, Melanie	P0.79, P3.126
Charles, Jo	S6.2.1
Charles, Marie-Aline	P2.15, SO9.4.8
Charlton, Karen	SO3.2.4
Charreire, Hélène	P1.145, P2.198, <u>S1.7.1</u>
Chastin, Sebastien	P0.24, P1.3.4, S2.7.3
Chastin, Sebastien, FM	<u>S1.6.2</u>
Chastin, Sebastien F M	P3C.208, P3C.209
Chauhan, Anoop	P3C.201
Chau, Josephine	<u>O1.3.3</u> , P2.161, <u>P2.211</u> , SO8.2.3, SO8.4.8
Chaurasia, Ashok	O5.2.1
Chauvin, Pierre	P3.15
Cheetham, Mandy	P1.41, P1.66
Chen, Juliana	<u>P3C.179</u>
Chen, Kong	SO9.4.6
Chen, Minghua	O1.2.5
Chen, Sanmei	P2.210
Chen, Tzu-An	P0.30, P1.47, SO1.3.5
Chen, Yu-Ling	<u>P0.187</u>
Cheval, Boris	P0.135
Chey, Tien	SO8.2.3
Chia, Audrey	P1.201
Chiari, Lorenzo	P2.189, P3.133
Childers, Sue	P3.138
Child, Stephanie	P2.158, P2.55
Chillón, Palma	<u>O1.2.3</u> , P0.108
Chilton, Sue	O1.3.5
Chimeddamba, Oyun	<u>P0.158</u> , <u>P3C.171</u>
Chin A Paw, Mai	O5.3.2, P0.163, P1.186, P2.114, P3.40, S2.5.3, S6.6.2, S6.6.3, S9.3.2, SO8.4.1
Chinegwundoh, Frank	P0.86
Chin, Huei-Min Linda	P3.58

Name	Presentation Code
Chinna, Karuthan	P1.106
Chittleborough, Cathy	SO5.4.3
Chmelík, František	P0.191, P3C.240
Cho, Chi	P3C.172
Choi, Ji-Yeob	<u>P1.191</u>
Choi, Wing Ka	P3.71
Chomitz, Virginia R	O1.2.1
Chong, Eunice	P1.102, P1.232
Choo, Wan Yuen	P1.106
Chouinard-Audette, Valérie	SO3.2.2
Chriqui, Jamie	O8.1.3, S5.6.2
Chrisitan, Hayley	SO2.4.5
Christensen, Ulla	O6.3.4
Christiane Toassa, Erika	P1.71, P2.219
Christian, Hayley	O4.3.4, <u>O5.1.4</u> , P3b.166, P3C.239, S8.7.1
Christian, Meaghan	<u>P3.42</u>
Christiansen, Lars	S1.1.2
Christiansen, Lars B	<u>P1.161</u>
Christie, Deborah	P3C.237
Christley, Robert	S8.7.1
Chua, Hwee Ling	P2.209
Chu, Anne	P1.201, P2.204
Chudy, Nadine	P0.141
Chui, Kenneth	O1.2.1
Chung, Alexandra	SO2.2.1
Chung, Seokang	P1.191
Chu, Yen Li	SO6.4.2
Clamp, Louise	P1.223
Clare, Farrand	S8.3.4
Clark-Carter, David	S6.1.3
Clark, Dawne	P1.188, P3b.160
Clarke, Adam	SO6.1.4
Clarke, Amy	P3.107, P3.108
Clarke, Joanne	O3.3.3, <u>SO5.4.6</u>
Clarke, Mike	S5.5.4
Clark, Julia	P0.171
Clark, Julie	P0.138
Clark, Marianne	P1.131
Clarys, Peter	P1.73, S1.4.2, S8.5.1, S8.5.3
Claude, Goulet	P0.26
Claudia S-K, Ching	S9.5.2
Clay, Olivio	SO2.4.8
Clays, Els	P1.157
Cleland, Claire	<u>P0.138</u>
Cleland, Ian	P2.207
Cleland, Verity	O6.2.5, O6.2.6
Clemes, Stacy	P0.132, P0.187, <u>P0.92</u> , P0.93, P1.206, P1.212, P2.190, P3C.198, S3.5.1, SO5.2.1
Cliff, Dylan	P1.208, P2.216, S5.2.1, S5.2.4, S6.6.1
Close, Lauren	P3.102
Cocks, Kim	P3.42
Cohen, David	S4.3.1
Cohen, Deborah	<u>P0.88</u>
Cohen, Emmanuel	<u>P0.99</u>
Cohn, Simon	O7.3.4, S3.2.4
Colabianchi, Natalie	P2.212
Colagiuri, Stephen	P2.32, SO2.2.2
Colby, Sarah	O4.3.5
Cole, Judith A	P3C.225
Coleman-Jensen, Alisha	P2.38
Colin, Christine	P0.118, P0.36
Collins, Clare	O3.2.4, O5.2.3, P2.70, P3.57, P3b.85, P3C.176, S6.2.3
Collins, Clare E	<u>S3.6.2</u>
Collins, Linda M	<u>P1.229</u>
Collins, Peter	<u>P2.156</u>

AUTHOR INDEX C – D

Name	Presentation Code
Colpo, Marco	<u>P2.189</u> , <u>P3.133</u>
Comans, Tracy	P1.52
Compernelle, Sofie	O6.2.3, <u>S1.7.2</u>
Connell, Lauren	<u>P1.178</u>
Connell, Lauren E	P1.171
Conroy, David	P1.178
consortium, myfood24	P0.143
Consortium, on behalf of HELENA	P1.233
Contento, Isobel	<u>P1.76</u> , <u>P3.122</u>
Contini, Caterina	S7.6.2
Conway, Terry	S1.1.2, S1.1.3
Cooke, Rachel	<u>SO4.4.2</u>
Cook, Kathryn	P1.81
Coolkens, Rosalie	<u>O3.2.1</u>
Coombes, Emma	<u>P1.158</u> , P3C.235
Cooper, Ashley	O5.3.5, P1.199, P1.83, P2.123, P2.178, S5.7.2, S5.7.3
Cooper, Cyrus	P3b.34
Cooper, Rachel	P2.117
Copeland, Jennifer	<u>O4.3.1</u>
Copeland, Kristen	P0.177, P2.88, <u>SO3.4.3</u>
Copin, Nane	P1.145
Coppinger, Tara	P2.142
Corder, Kirsten	O1.2.3, S7.3.1
Cordovez, Juan	S3.7.2
Corneau, Louise	P1.24
Cornélio, Marília	P0.60
Correa-Burrows, Paulina	<u>P1.117</u> , <u>P1.18</u>
Corry, Kelly	SO4.4.8
COSTA, BRUNO	P0.184
Costa, Silvia	<u>P1.206</u> , P1.212, <u>P3C.237</u> , S5.2.4, SO5.2.1
Costigan, Sarah	P3C.176
Côté, Marilou	O8.3.3, P2.233
Côté, Marilyse	P1.225
Cotton, Wayne	O9.3.1, P1.10
Cottrell, Lesley	<u>P3.138</u>
Coughlan, Edward	P2.142
Coulman, Elinor	S4.3.1
Coulon, Sandra	<u>O5.1.5</u>
Coulter, Elaine	S2.7.3
Courneya, Kerry	P1.128, P1.84, P2.95, P3.106, SO4.4.4
Couture, Christian	P0.190
Cowburn, Gill	<u>P3.4</u> , <u>S7.7.2</u> , SO9.2.1
Cowley, Joe	<u>P3.141</u>
Cox, Matthew	<u>P1.173</u> , P2.126
Cox, Robert	SO6.1.4
Coysh, Catherine	S9.3.1
Craig, Eva	S5.2.4
Craigie, Angela M	P2.97
Craig, Leone	P0.171
Cramp, Courtney	S4.3.4
Crane, Melissa M	<u>O8.3.2</u>
Crank, Helen	S9.3.3
Crawford, David	O3.1.3, P0.186, P1.46, P2.222, P3.9, S1.4.1, S3.3.1, S5.7.4
Crawford, Jennifer	<u>P1.128</u> , <u>P3.106</u>
Crespi, Catherine	P2.59
Crist, Katie	<u>P2.131</u> , <u>S7.7.1</u>
Crocker, Peter	S6.3.4
Crombez, Geert	S2.2.4
Crone, Diane	P0.164
Crone, Mathilde R	P1.89
Cronin, Kate	<u>P3.78</u>
Crossley, Stephen	P1.41
Crossley, Steven	P1.66
Croston, Amanda	P3b.151
Crutzen, Rik	<u>SO1.3.1</u>

Name	Presentation Code
Cruz, Joana	P0.145, P0.44, P3C.205
Cubbin, Catherine	O8.1.2
Cuberek, Roman	<u>P0.191</u>
Cullinan, John	P2.27
Cummins, Steven	SO1.4.5, SO9.4.2
Cunningham, Katie	P3C.227
Cunningham-Sabo, Leslie	P1.11, <u>P2.52</u> , SO64.5
Cupples, Margaret E	P3C.225
Currie, Cheryl	O4.3.1
Curry, Whitney	<u>P1.194</u> , <u>SO3.4.6</u>
Curtin, Kimberley	<u>SO3.1.2</u>
Curtis, Claire	P3b.165
Curtis, Jackie	P3b.33, SO9.2.4
Curtis, Kristina	<u>S2.4.2</u>
Curtis, Sarah	P1.199
Cutumisu, Nicoleta	P0.78, SO1.1.4
DA COSTA, FILIPE	P0.184
Dadabhoy, Hafza	P0.30, P1.5
Dagkas, Symeon	P1.194, SO3.4.6
DAHLY, DARREN	P2.172
Dale, Hannah	P3C.190
Daley, Amanda	P1.222, S9.3.3, SO5.1.2
Daley, Michelle	P2.211
Dallacker, Mattea	<u>P2.72</u>
Dall, Philippa	<u>P0.188</u> , <u>S2.7.3</u>
Dally, Kerry	S6.3.2
Dalsgaard, Josefine	<u>P0.110</u> , P0.34
Daly, Robin	SO9.4.3
Daly-Smith, Andy	P1.60, P3b.165
Daniels, Lynne	P0.183, P2.13, P2.17, P2.25, P3b.26
Dargent-Molina, Patricia	P2.15, SO9.4.8
d'Arripe-Longueville, Fabienne	P0.135
Das, AK	P1.140
Das, Bhikha	O6.2.4
Dascombe, Ben	O1.4.2
Davey, Cynthia	S5.1.1
Davey, Cynthia S	P3.49
Davey, Rachel	SO6.1.4
Davey, Trish	P1.20
David, Stephanie	O5.1.2, P2.43, SO2.4.7, SO4.2.3
Davies, Jennifer	P0.59
Davies, Melanie	P3C.191, S4.6.3
Davies, Melanie J	P0.42
Davies, Patricia	O3.1.2, P2.51
Davis, Deborah	SO6.1.4
Davis, Jaimie	<u>O4.2.6</u>
Davison, Brittany	P1.23
Davison, Gareth	P2.177
Davison, Kirsten	S4.7.1, <u>S6.2.1</u>
Davis, Samantha	<u>P0.3</u>
Day, Melissa	P3C.222
Day, Rhiannon	P3.42
Dean, Moira	P0.73, P3.4, <u>P3C.211</u> , S4.2.2
DE ASSIS, MARIA ALICE	P0.184
De Bacquer, Dirk	P1.157
de Barse, Lisanne	<u>P2.48</u> , <u>SO6.4.7</u>
De Bourdeaudhuij, Ilse	P1.186, P2.34, P2.67, P3.114, S1.1.2, S1.1.3, S1.1.4, S1.4.2, S1.6.3, S2.2.3, S2.2.4, S2.4.3, S2.5.1, S2.5.2, S2.7.1, <u>S4.6.2</u> , S5.2.3, S7.7.3, S8.5.1, S8.5.3, S9.5.1, SO2.4.3, SO2.4.4
De Bourdeaudhuij, Ise	P3b.91
De Clercq, Bart	<u>O6.3.2</u> , <u>P1.157</u>
De Cocker, Katrien	<u>S2.2.3</u> , S2.7.1
De Cock, Nathalie	<u>O5.2.5</u> , O5.2.6, <u>S8.2.2</u> , SO6.4.6
De Craemer, Marieke	S1.3.1, S5.1.2, <u>S5.2.3</u>
De Decker, Annelies	<u>S8.2.1</u>
DeDecker, Ellen	P0.17, S5.2.3

AUTHOR INDEX D

Name	Presentation Code
Dede Yildirim, Elif	O4.3.5, P1.72, P2.57
DeForche, Bendicte	S6.1.4
Deforche, Benedicte	O5.2.6, O6.3.2, S1.4.2, S2.5.1, S7.7.3, S8.5.1, S8.5.3, S9.5.1, S9.5.3, SO2.4.3, SO6.4.6
Deforche, Beneicte	SO2.4.4
de Geus, Bas	S8.5.1
De Gois, Telfia	P2.2
de Graaf, Kees	O2.1.3
DeGrace, Beth	P0.177
de Haan, Femke	P2.197
De Henaauw, Stefaan	P1.233, P1.73, S4.6.2, S8.2.1
DeJesus, Stefanie	SO1.2.4
de Jong, Elske	P3.77
de la Haye, Kayla	<u>S5.5.2</u>
Delaney, Tessa	P2.42, P3C.188
de Lauzon-Guillain, Blandine	P2.15, SO9.4.8
De Lepeleere, Sara	<u>P2.67</u> , <u>S1.3.1</u>
Delgado-Fernández, Manuel	P0.108
Della Gatta, Paul	SO9.4.3
Delp, Edward	P1.56
del Pozo Cruz, Borja	<u>P3.112</u> , <u>P3.56</u>
del Pozo Cruz, Jesus	P3.112
de Luna, Xavier	P3.8
De Marco, Molly	<u>P3.1</u>
Demetriou, Yolanda	<u>P0.128</u> , <u>P0.129</u>
Deming, Denise	P2.45
de Nazelle, Audrey	P2.192
Dencker, Magnus	<u>P2.93</u>
Deng, Karen	P1.232
Denis, Laurence	O3.3.1
Denney-Wilson, Elizabeth	P1.29
Denning, Yvette	P0.19
de Ridder, Denise TD	S8.1.4
Deriemaeker, Peter	P1.73
Deschênes, Laurie	P0.45
Deshpande, Sameer	SO3.4.5
De Silva weliange, shreenika	<u>P0.56</u>
DeSmet, Ann	<u>S2.4.3</u>
Desroches, Sophie	P1.40, P1.62, P3C.231
Desrosiers, Dominique	P1.225
Deussen, Andrea R	S4.3.4
Devereux-Fitzgerald, Angela	<u>SO6.2.2</u>
de Vet, Emely	S8.1.4, <u>S8.2.3</u>
Devine, Amanda	O2.2.4, O9.3.2, O9.3.4
Devine, Carol	<u>S7.5.1</u>
Devloo, Karlien	O2.3.5
de Vreede, Gert-Jan	SO1.2.2
De Vriendt, Tineke	P1.233
de Vries, Hein	P0.107, S2.2.2, SO4.4.7
de Vries, Nanne	P0.115, P2.171, S2.5.4
de Vries, Sanne	P2.171, S2.5.4
Devrnja, Antonela	<u>P3C.214</u>
De Wals, Philippe	P1.100, SO7.2.4
de Wit, John BF	S8.1.4
D'Haese, Sara	<u>S2.5.1</u> , S2.5.2
Dhaliwal, Satvinder	P1.56
Dhillon, Preet	P3b.161
Diamant, Shtiza	P0.69, P3C.210
Diaz, Ariel	P0.45
Diaz, Keith	P2.212
DiBiano, Robert	SO1.3.7
Dickin, Katherine	P3b.37
Dickin, Katherine L	P3.19
Dick, Matthew	S3.1.2
Diem, Sabine	O5.2.3
Diep, Cassandra	P1.47

Name	Presentation Code
Di Fabio, Diana	SO6.1.2
Digelidis, Nikos	SO11.2
Dijst, Martin	P3.134
DILLON, CHRISTINA	<u>P2.172</u>
Ding, Ding	<u>SO6.2.4</u> , SO8.2.3
Dinger, Mary	P2.92, <u>P3.92</u>
Dinkel, Danae	P3.76
Dion, Jacinthe	P3b.89
Direito, Artur	<u>O1.4.4</u> , <u>P2.134</u>
Dishman, Rodney	P1.155
Ditlevsen, Kia	<u>O3.3.4</u>
Divitini, Mark	O5.1.4
Dixon, Victoria	P2.39
Do, Anna	O1.3.3
Dobbie, Fiona	SO6.4.1
Dodd, Jodie M	S4.3.4
Dodd, Lorna	P1.98
Dodd-Reynolds, Caroline	<u>P3.75</u>
Dodds, Ellen	<u>P2.229</u>
Doerksen, Shawna	P1.178
Doherty, Aiden	P0.167, S7.7.2, SO1.3.6
Dohle, Simone	<u>P1.59</u> , SO1.2.3
Dollahite, Jamie	P0.148, P0.151, P3.19, P3b.37
Doll, Helen	S9.3.3
Dollman, Jim	<u>P0.125</u>
Dombrowski, Stephan	P3C.242
Dong, Frank	P1.85, P3.95
Donnachie, Craig	<u>P3C.206</u>
Donnelly, Alan	P0.178, P2.172
Donnelly, Paul	P2.140
Donohoe, Alex	P1.97
Donohue, Michael	O11.2
Donovan, Jenny	P1.108, P1.6
Doolan, Katy	<u>P0.100</u>
Dorling, Henry	<u>P3C.170</u>
Dorman, Sandra	O7.1.4, P3.63
Dormer, Cynthia	<u>P0.136</u> , <u>P3C.226</u>
Doucet, Éric	P0.91, P3b.31
Doughty, Robert	S8.3.1
Dowda, Marsha	S5.7.1
Dowd, Justine	S7.3.2
Dowd, Kieran	P0.178
Downing, Carrie	P1.86
Downs, Samantha	<u>P0.175</u> , S7.3.3
Doyle, Frank	P2.152
Doyon, Julien	P3C.177
Drane, Shannon	SO8.4.5
Drapeau, Vicky	P0.190, P0.26, P0.91
Draper, Carrie	SO4.1.2
Draper, Catherine	P1.144, <u>P3b.159</u> , S5.2.2
Drenner, Kelli	O6.1.2
Drijvers, Hannelore	O3.2.1
Duarte, Ana	P0.145, P3C.205
Dubois, Lise	P0.118, P0.36
Duchesne, Catherine	P3C.177
Duckworth, Lauren	P1.60
Duda, Joan	<u>S4.6.4</u>
Duda, Joan L	O3.2.2, P1.210, <u>P2.135</u> , SO1.1.2
Dudley, Dean	<u>O9.3.1</u> , <u>P1.10</u>
Due, Pernille	O6.3.2, P0.104, P1.57, P3.38
Duffrin, Melani W	P1.28
Dufour-Neyron, Hubert	P2.128
Dugrenier, Marilyn	P1.40
Duke-Williams, Oliver	O1.4.1
Dulin-Keita, Akilah	O6.1.2, SO1.4.7
Dulin Keita, Akilah	<u>SO1.4.1</u>

AUTHOR INDEX D – F

Name	Presentation Code
Dumas, Audrée-Anne	P1.40
Dumas, Nathalie	P1.100
Duncan, Michael	P0.23 , P0.65 , P1.81 , P2.127
Duncan, Mitch	P1.189 , P2.68 , P2.71 , S2.2.1 , SO4.4.8
Duncan, Mitch J	P2.164
Duncan, Scott	P1.104 , S7.2.2
Dunford, Elizabeth	P3.2 , S8.3.3
Dunlop, Dorothy	O4.1.3
Dunlop, Jacqueline	P3b.82
Dunlop, Mark	S2.3.4
Dunsmuir, Sandra	O1.4.1
Dunstan, David	P2.214 , S3.5.1 , S3.5.2 , S7.3.4 , SO3.1.3 , SO9.4.3 , SO9.4.4
Dunton, Genevieve	P2.65 , P2.83 , S4.1.2
Dwyer, Genevieve	O5.1.1
Dwyer, Laura	P1.180 , P1.215 , P1.216 , P1.68 , P3b.81
Dygryn, Jan	P0.130 , P0.146 , P0.48
Dzewaltowski, David	P1.78
Dzewaltowski, David A	P3.142
Dzubur, Eldin	P2.83 , S4.1.2
Eades, Sandra	P1.204 , P2.184
Eagleson, Serryn	P2.43 , S7.2.3 , SO2.4.7
Ebner-Priemer, Ulrich	SO8.4.6
Ebner-Priemer, Ulrich W	P3C.224
Ebrahim, Shah	P3b.161
Economos, Christina	S3.6.3
Economos, Christina D	O1.2.1 , P0.10 , P1.69 , P1.70
Edelson, Lisa R	P2.217
Edmunds, Sarah	P0.185 , P3C.222 , P3C.233
Edwards, Mark	P3C.185
Edwardson, Charlotte	P3C.191 , S4.6.3
Edwards, Richard	P1.26
Eekhout, Natasha	P0.96
Egan, Bernadette	SO7.2.3
Eger, Tammy	P3.63
Eggermont, Steven	O5.2.5 , O5.2.6 , S8.2.2 , SO6.4.6
Eggert, Erin	P3.61 , P3.76
Ehlers, Diane	P2.149 , SO1.2.2
Ehrlich-Jones, Linda	O4.1.3
Eime, Rochelle	P0.79 , P3.126
Eisenberg, Miriam	O2.1.1 , O2.1.4 , O2.1.5
Ekelund, Ulf	S5.7.3
Elavsky, Steriani	P1.178
Elgar, Frank	O6.3.2
Elhakeem, Ahmed	P2.117
Eliasziw, Misha	P1.70
Ellaway, Anne	P0.138 , P0.80 , P2.138 , P3C.235
Ellingson, Laura	P0.32
Elliott, Rosalind	P1.29
Ellis, Brian	P0.188
Ellis, Naomi	P3C.192
Ellis, Sarah	P0.188
Ellis, Yvonne	P2.216
Ells, Louisa	O1.1.1
Elwell, Kate	P1.42
Emezue, Amarachi	P2.66
Emond, Claudie	P3b.89
Émond, Claudie	P1.225 , P3.120
Eneli, Ihuoma	P1.101
Engelen, Lina	O1.3.3 , P2.161
English, Emily	O4.2.5
English, Loral K	SO6.4.1
Enkelejda, Shkurti	P0.69 , P3C.210
Enwald, Heidi	P3C.215 , SO4.4.1
Eriksen, Aud Marit	P1.36
Eriksson, Ulf	P2.192

Name	Presentation Code
Erjavec, Mihela	P2.8
Erkkola, Maijaliisa	P2.33
Ermes, Miikka	P0.103
Er, Pei Ling	P1.201
Er, Vanessa	P0.86
Esliger, Dale	S5.7.3
Estabrooks, Paul	P1.111 , P2.150 , P2.64 , P2.87 , SO5.1.4
Estabrooks, Paul A	P1.182
Esteban-Cornejo, Irene	P2.166
Estevam Cornelio, Marilia	P1.63
Estevam Cornélio, Marília	P0.5
Estrada, John	P3C.243
Etman, Astrid	P2.107
Ettema, Dick	P3.134
EuroFIT Consortium, on behalf of the	P2.170 , P3.48
Evans, Alexandra	O3.3.1 , O4.2.4 , P1.103 , P1.105
Evans, Charlotte	P0.143 , P1.3
Evans, Ellen	O6.2.4
Evans, Josie	P2.148
Evenhuis, Heleen	S8.6.3
Evenson, Kelly	P0.105 , P0.88
Evers, Silvia MAA	SO4.4.7
Ewald, Ben	P0.174
Eyles, Helen	O2.2.5 , S5.6.1 , S8.3.1
Eynon, Michael	P2.103
Eyre, Emma	P0.65
Fabio, Almeida	SO5.1.4
Fabra, Priscila	SO1.1.2
Fahey, Paul	P1.122 , P3C.217
Fairclough, Stuart	O7.1.2 , P0.175 , P1.138 , P2.133 , S7.3.3 , SO3.4.8 , SO8.4.3
Falconer, Catherine	O5.3.5 , P1.136 , P2.178
Fallon, Megan	P2.50
Fallowfield, Jo	P1.20
Falzon, Charlène	P0.135
Fanning, Jason	O2.3.4 , P2.149
Farooq, Abdulaziz	P0.106 , P1.114 , P2.227 , P3.98
Farrand, Paul	P2.157
Farrell, Tracy	S7.5.1
Farris, Alisha	S4.1.1
Farrow, Damian	P3b.149
Faught, Erin	P3C.219 , SO6.4.2
Faulkner, Guy	P1.150 , P3.110 , P3.118 , S6.3.1 , SO3.4.5
Faulkner, Maria	P2.177
Faustino, Shirlei	P0.154
Fawkner, Samantha	P2.147 , P2.151
Fearnbach, Stephanie Nicole	SO6.4.1
Fedel, Karla	O1.3.3
Fedewa, Michael	O6.2.4
Fehst, Andrew	P0.21
Feltlová, Dana	P1.179
Feng, Xiaoqi	O5.1.1 , O5.3.3 , P1.205 , P2.43 , P3C.217
Fenton, Sally A M	O3.2.2 , P1.210 , P2.135
Ferguson, Neil	P0.80
Ferguson, Ty	O7.1.5
Ferkins, Lesley	P1.104
Fernandes, Ana Carolina	P0.11
Fernandes, André	P0.133
Fernandes-Machado, Sandra	P1.53
Fernandes, Ricardo	P0.25
Fernandez, Diana I	S4.3.2
Fernandez, Melissa	P1.62
Fernandez-Rao, Sylvia	O6.1.5
Fernández-Santos, Jorge	P2.166
Fernández-Vázquez, Rosalía	P3C.244

AUTHOR INDEX F – G

Name	Presentation Code
Fernando, Dulitha	P0.56
Ferrar, Katia	P2.181, SO8.2.4
Ferrer, Rebecca	P1.215
Ferriby, Megan	<u>P2.220</u>
Ferrier, Suzanne	<u>P3C.236</u>
Feskens, Edith JM	P1.89
Féthière, Christelle	P1.231
Fiatarone-Singh, Maria	P3.125
Field, Alison	P3C.197
Figler, Mária	P0.114
Figueiredo, António	SO5.4.5
Fildes, Alison	P2.13
Finch, Meghan	P0.124
Finkelstein, Eric	P0.105
Finlayson, Graham	O1.3.2, P0.91, P2.75
Finley, Anna Marie	S3.6.3
Finnane, Julia	P3b.26
Fisher, Abigail	P1.190, P1.192, P2.195
Fisher, Jennifer	<u>S4.7.1</u> , S4.7.2
Fisher, Jennifer O	P2.12, SO6.4.1
Fisher, Koren	<u>P2.163</u>
Fisher, Pat	O8.1.4
Fitzgerald, Anthony	P1.170
Fitzgerald, Anthony P	P2.169
Fitzhugh, Eugene	P3C.172
Fitzpatrick, Ben Lee	P2.191
Fitzsimons, Claire	P0.137, P1.148, S2.7.3
Flego, Anna	S4.5.3
Fleig, Lena	O5.3.4, P2.125
Fleischer, Nancy	P2.38
Fleming, Deborah	P1.121
Fleming, Joanna	<u>P0.117</u>
Fletcher, Adam	SO5.4.7
Fletcher, Elly	P2.213, S3.5.1, <u>SO9.4.4</u>
Fletcher, Richard	P3b.153
Fleuren, Tobias	P1.90
Flint, Ellen	<u>SO9.4.2</u>
Flood, Vicki	P2.14, P3.2, SO3.2.4
Florindo, Alex	P2.96
Fogelholm, Mikael	P3C.202
Fojtik, Igor	P1.179
Foley, Louise	<u>P1.137</u> , S3.2.1
Folkvord, Frans	<u>S3.4.4</u>
Folta, Sara	S3.6.3
Folta, Sara C	P1.69, P1.70
Fontvieille, Anne-Marie	P1.145
Forbes, Cynthia	<u>P2.95</u> , <u>SO4.4.4</u>
Forbes, David	P1.96
Ford, Melissa	P2.92
FORHAN, Anne-Marie	SO9.4.8
Fornazieri, Mariana	P0.50
., for the ISCOLE Research Group	SO8.2.2
Forthofer, Melinda	P3.45
Foster, Charlie	<u>O1.3.1</u> , P0.167, P1.123, P1.143, P2.139, P3.127, P3.128, <u>S2.3.1</u> , S7.7.2, SO1.3.6, SO3.4.1
Foster, Sarah	<u>O4.3.4</u> , O5.1.4, SO2.4.5
Foulkes, Jonathan	P1.135
Fournier, Marion	P0.135
Fowweather, Lawrence	<u>P1.135</u>
Fowler, James	O1.1.2
Fox, Kenneth	P2.179
Francis, Daniel	O1.3.1
Franco, Oscar	P2.19, P2.47, P2.48, SO6.4.7
Frankel, Leslie	P0.9
Frank, Lawrence	<u>O4.3.3</u> , <u>O8.1.4</u> , S1.1.3, SO2.4.1
Franklin, Janet	O8.3.4

Name	Presentation Code
Franzen, Lisa	P2.57
Fraser, Sarah	P1.146, P2.187, SO9.4.5
Fraser, William	P0.118, P0.36
Frazao, Elizabeth	S3.1.3
Freedman, Darcy	SO4.1.2
Freeman, Ruth	SO6.4.8
Freeston, Jonathan	P3.125
Freiberger, Ellen	S1.3.4
French, David	P0.82, P3.72, SO6.2.2
French, Jasmine	P2.8
Freudenberg, Nicholas	O8.1.5
Fricke, Hollyanne	P2.30, SO4.1.4
Frick, Fabienne	<u>P0.180</u>
Friebur, Robin	S3.3.3
Friederichs, Stijn	S2.2.2
Friedman, Alinda	P0.162
Friel, Sharon	P1.4, P2.7, P3b.24
Froböse, Ingo	P0.180
Fromel, Karel	P0.130, P0.148, P0.48, P0.59
Frömel, Karel	P3C.240
Frongillo, Edward	P2.38
Füge, Kata	P0.114
Fulkerson, Jayne	O2.1.2, P1.42, P1.45
Gába, Aleš	P0.191
Gabel, Leigh	<u>SO9.4.3</u>
Gagnon-Girouard, Marie-Pierre	O8.3.1, <u>O8.3.3</u>
Gagnon, Jocelyn	P0.190
Gagnon, Marie-Pierre	P3C.231
Gaines, Alisha	P0.148, <u>P0.151</u>
Galaviz, Karla	P1.182
Galea Holmes, Melissa N	<u>P1.154</u>
Gale, Joanne	SO8.2.1
Gallagher, Alison	P0.100, P2.162
Gallagher, Dunla	<u>P2.226</u>
Gallagher, Martina	SO3.4.7
Gallagher, Stephen	P0.100
Gallani, Maria Cecilia	<u>P0.5</u> , <u>P1.63</u>
Gallani, Maria-Cecilia	P0.60
Gallegos, Danielle	P1.52
Gall, Seana	O6.2.5, O6.2.6, P1.49
Galvim, André	P0.154, P0.50
Gama, Augusta	P0.139
Gandonou M., Michael K	SO7.2.4
Gans, Kim	<u>O6.1.2</u> , SO1.4.1, <u>SO1.4.7</u>
Gaoua, Nadia	P2.227
Gao, Zan	P1.126, <u>P3.96</u> , <u>P3b.152</u> , <u>S9.1.1</u> , <u>S9.1.3</u>
Garcia-Cervantes, Laura	P1.160
Gardiner, Paul	P2.125
Gardner, Ben	O5.3.1
Gardner, Benjamin	P2.179
Gardner, Christopher	P1.77
Garitano, Iñaki	P3.47
Garnham-Lee, Katy	<u>P1.136</u>
Garnweidner-Holme, Lisa	P1.36
Garnweidner-Holme, Lisa Maria	<u>P3.47</u>
Gaston, Anca	SO1.2.4
Gately, Paul	P3b.165
Gates, Allison	<u>P0.21</u>
Gates, Michelle	P0.21
Gatto, Nicole	O4.2.6
Gaudreau, Patrick	O3.2.5
Gauthier, Alain	O7.1.4
Gauvin, Lise	P0.78, SO1.1.4
Gavarkovs, Adam	P3.17
Gavin, William	O3.1.2, P2.51
Gay, Jennifer	O4.2.1

AUTHOR INDEX G

Name	Presentation Code
Gearon, Emma	SO2.2.1
Gebel, Klaus	P1.122
Gebremariam, Mekdes	<u>P0.163</u>
Gee, Nancy	P0.188
Gehre, Claudia	S4.7.1
Genc, Murat	S5.6.1
George, Emma	<u>P1.214</u>
George, Emma S	P2.164
Gerards, Sanne	P1.17, P1.99, <u>P3.73</u>
Gerike, Regine	P2.192
Germov, John	P3C.176
Gershuny, Jonathan	P0.167
Gertel-Rosenberg, Allison	P1.88, S6.5.3
Gesell, Sabina	<u>S5.5.3</u>
Getchell, Nancy	P0.147
Geurts, Luc	O2.3.5
Geyer, Justine	P1.148
Ghekiere, Ariane	<u>S1.4.2</u> , S7.7.3
Gheysen, Freja	<u>P3C.177</u>
Giacomantonio, Nicholas	P0.173, P1.202, P2.174, P3C.232
Giannopoulou, Christina	P1.116
Gibbons, Catherine	O1.3.2
Gibbons, Rebecca	P1.195
Gibson, Alice	<u>O8.3.4</u> , <u>SO2.2.2</u>
Gibson, Irene	P3C.227
Gidlow, Christopher	P3C.192, <u>S6.1.3</u>
Gilbert, Stephen	S9.3.3
Giles, Adriana	O1.4.2
Giles-Corti, Billie	O4.3.4, O5.1.2, <u>O5.1.3</u> , O5.1.4, P2.43, P3C.239, S7.2.3, <u>SO1.4.6</u> , SO2.4.5, SO2.4.7, SO4.2.2, SO4.2.3
Gilinsky, Alyssa	P3C.228
Gillatt, David	P1.6
Giller, Tara	O3.2.3
Gillham, Karen	P2.42
Gilliland, Betsy	SO7.4.8
Gillison, Fiona	P0.87
Gill, Jason	P1.187
Gillman, Matthew	O4.2.3
Gil, Melissa	SO3.4.7
Gilmore, Katelyn	P1.156, P1.168, P3.139
Gilson, Nicholas	P0.81, <u>P2.68</u> , <u>P3b.156</u>
Gittelsohn, Joel	P0.29, <u>S7.1.1</u>
Giurgiu, Marco	P3C.224
Glonti, Ketevan	O6.2.3, <u>S1.7.3</u>
Glowa, Alexander	P0.180
Glümer, Charlotte	O2.2.2, O6.3.4
Godbole, Suni	S7.7.1
Godin, Gaston	P0.60, P0.84, P1.63
Godino, Job	<u>O1.1.2</u>
Godwin, Alison	P3.63
Goergen, Andrea	S5.5.2
Goetschi, Thomas	P2.192
Goffe, Louis	P2.16, <u>P2.20</u> , P2.21
Goh, Si Ning	P2.209
Goldberg, Jeanne P	<u>P1.69</u> , <u>P1.70</u>
Golden, Daphne	<u>P0.147</u>
Goldman-Rosas, Lisa	S3.2.2
Gollust, Sarah	SO4.2.1
Golsteijn, Rianne HJ	<u>P0.107</u> , <u>SO4.4.7</u>
Gomersall, Sjaan	P2.68
Gomersall, Sjaan R	<u>P1.221</u>
Gomes, Grace	<u>P0.154</u> , <u>P0.50</u>
Gonçalves, Pedro	P0.44
Gonçalves, Ricardo	<u>P0.145</u> , P0.44, <u>P3C.205</u>
Goniu, Natalie	P3.78

Name	Presentation Code
González-Gross, Marcela	P1.233, SO6.4.2
Goodell, L Suzanne	P1.43
Goodell, Suzie	P1.50
Goodman, Anna	O7.3.3, <u>S5.7.2</u> , <u>SO1.1.3</u> , SO6.1.1
Goodman, Elizabeth	O1.2.5
Goossens, Lien	O5.2.5, S8.2.2
Gorczynski, Paul	<u>P3.110</u>
Gordon, Joanna	<u>P2.136</u>
Gorely, Trish	P2.148, <u>P2.194</u> , S4.6.3
Gorham, Gemma	O6.1.2, SO1.4.7
Gormley, Candice	SO5.2.2
Gouws, Chantell	<u>P2.81</u>
Gowen, Rose	O4.2.1
Graham, John	P1.178
Graham, John W	<u>P1.171</u>
Graham, Meredith	P3b.84
Graham, Meredith L	S4.3.2
Graham, Taryn	S6.1.2, S8.7.3
Granat, Malcolm	P0.188
Grant, Joshua	P3.138
Grant, Margaret	P0.188
Graves, Lee	<u>P3C.195</u> , SO8.4.3
Gray, Casey	<u>P1.195</u>
Gray, Cindy	<u>O2.3.1</u> , P2.148, <u>P2.170</u> , P3.48, SO9.2.3
Gray, Heewon	P1.76
Graziose, Matthew	P3.122
Greaney, Mary	P0.68
Greatwood, Hannah C	<u>P1.60</u>
Greaves, Colin	P2.157, <u>SO5.1.1</u>
Greblo, Zrinka	P0.181
Grech, Amanda	<u>P2.23</u>
Green, Colin	P2.157
Greene, Geoffrey	O4.3.5
Green, Erin	P0.148
Greenhalgh, Fiona	P2.1
Greenhalgh, Trish	SO1.4.5
Green, Joseph	P0.7
Greenland, Jonathan	P3C.218
Greenway, Matthew	P3.132
Greenwood, Carl	P1.211
Greenwood, Darren	P0.143
Grieben, Christopher	P0.180
Grierson, Charlotte	P2.127
Griffin, Simon	O7.3.2, P2.84, SO3.1.1
Griffin, Tania	<u>O3.3.3</u> , <u>P3.51</u>
Griffiths, Frances	P0.117
Griffiths, Paula	P1.212, P2.199, P2.200, P3C.189
Grivell, Rosalie M	<u>S4.3.4</u>
Groenenberg, Iris	P1.89
Groffik, Dorota	P0.148, P0.59, P3C.240
Grogan, Sarah	P3C.192
Gross, Deborah	O4.2.3
Groth, Susan	S4.3.2
Group, HELP Trial Study	P3C.237
Grove, Annie	SO7.4.2
Gruenewald, Tara	S4.1.2
Grunert, Klaus G	S7.6.2
Grunseit, Anne	S6.3.3
Guagliano, Justin	O5.1.1, P1.214, <u>P3.123</u>
Guan, Weihua	P0.126, P0.182
Gubbels, Jessica	<u>P1.17</u> , P2.171
Gubhaju, Lina	P1.204, P2.184
Guell, Cornelia	O7.3.4, P0.94, S3.2.3, <u>SO3.1.1</u>
Guentcheva, Iliana	O6.3.5
Guerra, Paulo Henrique	P1.71, P2.219
Guertler, Diana	<u>P1.189</u>

AUTHOR INDEX G – H

Name	Presentation Code
Gunatilake, Jagath	P0.56
Gundersen, Craig	P2.38
Güner, Özlem	O3.3.2
Gunnell, Katie	O3.2.5
Gunturk, Bahadır	SO1.3.7
Gunzer, Wolfgang	P0.113
Gustafson, Alison	<u>P1.13</u> , <u>P2.31</u>
Gutta, Pavan	P3C.201
Haaland, Benjamin	P0.105
Haase, Anne	O5.2.2
Hackshaw-McGeagh, Lucy	P1.108
Hadgraft, Nyssa	S11.4, <u>SO3.1.3</u>
Haehnel, Rebecca	P0.120
Hager, Erin	<u>SO5.2.2</u>
Häggström, Jenny	P3.8
Hagströmer, Maria	P3.130
Haines, Jess	<u>O4.2.3</u>
Hales, Derek	O3.1.5
Halila, Fawzi	P3.116
Halligan, Joel	P2.16
Hall, Nathan	P1.74
Hall, Stephanie	SO4.4.8
Halpin, Sean	O1.4.2
Hamdy, Freddie	P1.108, P1.6
Hamer, Mark	<u>O5.3.1</u> , P1.110, P1.190, P1.192, <u>P2.179</u> , P2.195, P3C.182
Hamilton, Alex	SO1.3.6
Hamilton, Alexander	<u>P3.128</u> , S7.7.2
Hamlet, Neil	P3C.190
Hammerlund, Madeleine EM	P0.120
Hammond, David	P0.155, P1.64, SO7.4.3
Hammond, Ross	P2.38
Hampton, Louise	P2.123
Hamrik, Zdenek	<u>P1.162</u> , P3.115
Han, Bing	P0.88
Hanbury, Amelia	<u>P2.44</u>
Hankey, Catherine	P2.232, <u>P3b.22</u> , <u>S9.7.1</u>
Hankonen, Nelli	<u>P2.188</u> , P3C.223
Hanna, Donncha	P0.100, P2.140, P2.191
Hannan, Peter	P3b.152
Hanning, Rhona	P0.21, P3C.204
Hann, Mark	P0.82
Hannon, Lonnie	SO2.4.8
Hannon, Stephen	P2.140
Hanratty, Barbara	P3C.200
Hansen, Bjorge	S5.7.3
Hanson, Sarah	<u>P1.167</u> , <u>P1.169</u>
Hanvey, Judith	P3C.241
Ha, Phat	P1.232
Happel, Kyle	P3C.243
Happell, Brenda	S2.2.1
Harber, Vicki	P1.188, P3b.160
Harden, Samantha	P1.111
Hardie, Michelle	P3.109, <u>SO5.2.3</u>
Harding, Sarah	<u>P2.178</u>
Hardman, Carla	<u>P0.194</u>
Hardy, Rebecca	P2.117
Harellick, Linda	P0.10
Haresign, Helen	P3C.204
Harmon, Brook	<u>P3.45</u> , <u>P3.52</u>
Harms, Teresa	P0.167
Harnack, Lisa	P2.229, S3.3.3
Harnik, Peter	P0.88
Harrington, Daniel	P1.232
Harrington, Deirdre	P3C.220, SO8.2.2
Harrington, Janas	P1.170

Name	Presentation Code
Harrington, Janas, M	<u>S1.6.1</u>
Harrington, Janas M	P2.169, P2.27, SO1.3.3
Harrington, Richard	P3.4
Harris, Jennifer	<u>S3.4.3</u>
Harris, Kevin	P0.59
Harris, Mark	O1.1.3, P1.228, SO9.2.2
Harris, Melissa	SO3.2.3
Harrison, Elizabeth	P2.163
Harrison, Flo	P2.186
Harry, Lorene	O8.1.5
Hartmann, Christina	<u>P2.228</u> , <u>P3.60</u>
Harvey, Jack	P0.79, P3.126
Harvey, Jean	O1.1.1
Harvey, Johanne	P1.225
Harvey, Juliet	<u>P0.24</u>
Harvey, Juliet A	P3C.208
Hassanbeigi, Fatemeh	P1.16
Hassel, Holger	<u>P1.90</u> , <u>P3.13</u>
Haukkala, Ari	P2.188, P3b.35
Haveman-Nies, Annemien	O2.1.3
Hawari, Nabeha	<u>P1.187</u>
Hawkes, Corinna	S8.3.3
Hayashi, Takeshi	P0.89
Hayball, Felicity	<u>P2.138</u>
Haycraft, Emma	P2.199, P2.200
Hayes, Louise	<u>P2.118</u>
Haynie, Denise	O4.1.1, O5.2.1
Healy, Genevieve	SO3.1.3
Hearn, Shane	S6.3.3
Hearst, PhD, MPH, Mary O	SO1.4.3
Hearst, Mary	<u>P1.19</u> , <u>P1.42</u> , P2.4
Hebden, Lana	O1.1.3, P1.15, P1.228, P2.2, <u>P2.32</u> , <u>P3.55</u> , SO9.2.2
Hedrick, Valisa	<u>P1.79</u>
Heery, Emily	S4.3.3
Heesch, Kristiann C	S2.3.2
He, Feng	S8.3.4
He, Gang	<u>O1.2.4</u> , O4.1.5, P0.22
Heinen, Eva	O7.3.2, <u>P0.95</u> , P1.137, <u>S3.7.3</u> , S3.7.4
Heino, Matti	P2.188
Heinonen, Ari	P1.123
Heinrich, Katie	P1.168, P3.139
Heinrich, Katie M	<u>P1.156</u>
Henderson, Steven	P0.59
Hendriksen, Marieke	P3b.91
Hendriks, Marike	<u>P1.95</u> , <u>SO2.2.4</u>
Hennessy, Erin	P1.180, <u>P1.215</u> , P1.216, P1.68, P2.61, P3b.81, <u>SO5.4.2</u>
Hennink-Kaminski, Heidi	P2.62
Henson, Joseph	P3C.191
Herbert, Jessica	S4.5.3
Hercberg, Serge	P2.198
Herka, Agnes	P0.113
Herrador-Colmenero, Manuel	<u>P0.108</u>
Herring, Louisa	<u>P0.42</u>
Hertwig, Ralph	P2.72
Hesketh, Kathryn	<u>P2.84</u> , P3b.28
Hesketh, Kylie	<u>O3.1.3</u> , P0.17, P2.112, P3b.148, <u>S6.5.1</u>
Heslehurst, Nicola	<u>P2.118</u> , <u>S9.7.2</u>
Heslop, Karen	P3C.200
Hespe, Dominique	P2.161
Heude, Barbara	P2.15, SO9.4.8
Hewitt, Allan	P2.177, S2.3.4
Hewitt, Gillian	<u>SO5.4.7</u>
Heys, Steven	P0.171
Hibbert, James	SO4.1.2
Hickerson, Ben	P1.106
Hidalgo, Dario	S3.7.2

AUTHOR INDEX H – I

Name	Presentation Code
Hides, Leanne	O1.4.2
Hiek, Janet	P1.26
Higgs, Matthew	O2.3.1
Hilgenkamp, Thessa	<u>S8.6.3</u>
Hill, Ali	<u>P1.67</u>
Hilland, Toni	<u>P1.121</u> , <u>P3b.151</u>
Hillesund, Elisabet R	P1.30
Hillier-Brown, Frances	<u>O2.2.1</u> , <u>P2.22</u> , <u>SO1.3.6</u>
Hill, Jennie	<u>P2.150</u> , <u>P2.64</u> , <u>P2.78</u>
Hill, Laura	P1.43
Hillsdon, Melvyn	O4.1.2, P1.207, P2.157, P2.202
Hill, Tessa	<u>P1.148</u>
Hill, Tisa	<u>P0.148</u> , <u>P0.151</u> , <u>P3b.37</u>
Hilton, Shona	S3.2.1
Hinckson, Erica	<u>P2.203</u> , <u>S3.5.4</u>
Hindle, Elaine	P0.138
Hingle, Melanie	<u>P2.28</u>
Hinkley, Trina	P1.144, P2.213, <u>S5.2.1</u> , <u>S5.2.2</u> , <u>SO5.2.1</u>
Hino, Adriano	S1.1.1, <u>S3.7.1</u>
Hipp, Aaron	SO4.2.1
Hipp, J Aaron	S6.1.1
HiraSing, Remy	P3.77
Hirschman, Abigail	P0.65
Hirschman, Jay	P2.38
Hnatiuk, Jill	<u>P0.17</u> , <u>P2.112</u> , <u>S2.7.4</u>
Hobin, Erin	P0.155, P1.64, <u>SO7.4.3</u>
Hodgkins, Charo	P3.4, <u>SO7.2.3</u>
Hodgson, Susan	P2.1
Hoedjes, Meeke	<u>P1.230</u>
Hoekstra, Trynke	SO8.4.1
Hoelscher, Deanna	P1.103, P2.58, <u>SO7.4.7</u>
Hoelscher, Deanna M	<u>SO7.4.5</u>
Hoerr, Sharon	O4.3.5
Hoffmann, Belinda	S1.3.1
Hoffman, Sara A	P1.229
Hofman, Albert	P2.48
Hohman, Emily	P3b.88
Hoiting, Jill	P3b.90
Holder, Roger	S2.3.3
Holdsworth, Michelle	P0.99, <u>S1.6.2</u> , <u>S6.7.1</u> , <u>S6.7.3</u>
Holland, Rob W	S8.1.2
Hollis, Jenna	<u>P1.152</u> , <u>P1.153</u> , <u>P3b.158</u>
Hollywood, Lynsey	<u>P0.73</u> , <u>P3C.211</u>
Holmes, David	O1.3.5
Holmes, kathryn	O1.4.3
Holm, Lotte	S7.5.3
Holm, Sofie Gars	P0.34
Holowko, Natalie	<u>SO6.1.1</u>
Holsen, Ingrid	P2.86
Holstein, Bjørn	P0.41
Holstein, Bjørn E	P1.55
Holt, Annie	<u>SO2.4.6</u>
Holt, Nicholas	P1.128, P1.131, <u>P3.106</u>
Hommes, Franziska	P3C.229
Honda, Takanori	<u>P2.210</u>
Honda, Toru	P0.89
Höner, Oliver	P0.128
Hong, S Lee	P0.30
Hongu, Noboku	P2.76, P3.65, <u>P3b.86</u>
Hoogendoorn, Adriaan	P2.134
Hooker, Stephanie A	<u>P2.146</u>
Hooker, Steven	<u>P2.212</u> , <u>SO1.2.2</u>
Hoolihan, Courtney	P2.5
Hooper, Paula	O4.3.4, <u>O5.1.2</u> , <u>O5.1.3</u> , <u>P3C.239</u> , <u>SO2.4.5</u> , <u>SO2.4.7</u>
Hopkins, Laura	P0.29
Hopping, Beth	SO2.1.3

Name	Presentation Code
Horacek, Tanya	<u>O4.3.5</u> , <u>P1.72</u> , <u>P2.57</u>
Horne, Maria	<u>P0.132</u> , <u>P3C.198</u>
Horner, Katy	<u>P2.75</u> , <u>P3.119</u> , <u>P3.62</u>
Horning, Melissa	<u>O2.1.2</u> , <u>P1.45</u>
Horodyska, Karolina	P3b.91
Horwath, Caroline C	P0.13
Horwood, Jeremy	P1.6
Houle, Julie	<u>P0.45</u>
Howard, Steven	P1.208
Howard, Virginia	P2.212
Howat, Peter	P1.56, <u>SO2.4.6</u>
Howden-Chapman, Philippa	O7.3.5
Howe, Laura	SO5.4.4
Howse, Eloise	P2.32
Hsieh, Ai-Chen	<u>P3.58</u>
Hsu, Ya-Wen	<u>P1.132</u> , <u>P1.196</u> , <u>P1.34</u>
Huang, Chao	S4.3.1
Huang, Charles	S9.1.1
Huang, Wendy	O1.2.4, <u>O4.1.5</u> , <u>P0.22</u>
Hubbard, Kristie L	O1.2.1
Huberty, Jennifer	P3.76, <u>SO1.2.2</u>
Hublet, Anne	O6.3.2
Hublin, Christer	P3C.202
Huddy, Rebecca	P3.7
Hudson, Joanne	P2.8
Hudson, Lee D	P3C.237
Hudson, Nicky	P3.108
Hughes, Adrienne	P3b.144, <u>P3C.228</u>
Hughes, Daniel	P1.173, <u>P2.126</u>
Hughes, Donna	S5.5.2
Hughes, Sheryl	<u>P1.43</u> , <u>P1.50</u> , <u>S4.7.2</u> , <u>SO1.3.5</u> , <u>SO5.4.2</u>
Hughes, Sheryl O	<u>P2.12</u>
Hughes, Stephanie	P3C.201
Hughey, S Morgan	<u>P2.158</u> , <u>S6.1.1</u>
Huh, Jimi	S4.1.2
Hull, Katherine	P3.107, <u>P3.108</u>
Hulteen, Ryan	<u>P3.97</u> , <u>S9.1.4</u>
Hume, DJ	P1.223
Humphris, Gerry	P3C.190
Hunter, Jennifer	P2.145
Hunter, Ruth	<u>O1.3.5</u> , <u>P3C.241</u> , <u>S5.5.1</u> , <u>S5.5.4</u>
Hunter, Stephen	P0.162
Hunt, Kate	P2.170, <u>P3.48</u> , <u>P3C.206</u> , <u>SO9.2.3</u>
Hurley, Jane	SO7.4.4
Hurley, Kiya L	O9.3.3
Hurley, Kristen	O6.1.5
Hurst, Gemma	P3C.192, <u>S6.1.3</u>
Husband, Andrew	P0.169
Huseinovic, Ena	<u>P0.71</u>
Hussain, Aysha	<u>P1.36</u>
Hussaini, Alya	O3.3.1
Hussey, James	S6.1.1
Hutchesson, Melinda	<u>O1.1.1</u> , <u>P2.70</u> , <u>P3b.85</u> , <u>P3C.176</u> , <u>S9.7.3</u>
Hutchinson, Amanda	S5.5.2
Hutchinson, George	O1.3.5
Hutchinson, Susan	P3.92
Hutto, Brent	P2.212, <u>P3C.181</u>
Huybrechts, Inge	<u>P1.233</u> , <u>P1.73</u> , <u>SO6.4.2</u>
Huybregts, Lieven	S8.2.2
Hynynen, Sini	P2.188, <u>P3C.223</u>
Iacopozzi, Petula	P3.133
Iannotti, Ronald	<u>O4.1.1</u> , <u>O5.2.1</u>
IBRAHIM, IZZELDIN	<u>P3.93</u> , <u>P3.98</u>
Ihekweazu, Chioma	P2.62
Ikäheimo, Tiina M	P3C.169
Iliffe, Steve	P2.179

AUTHOR INDEX I – K

Name	Presentation Code
Immonen, Milla	P3C.215
Inchley, Jo	P2.145
Inchley, Joanna	P3.115
Ingram, Jenny	P3.41
Inskip, Hazel	P3b.34
Intille, Stephen	P2.83, S4.1.2
Int Panis, Luc	P2.192
Iotova, Violeta	S5.1.2
Iovota, Violeta	P2.34
Ireland, Aileen	P2.148
Irwin, Brandon	<u>S5.5.1</u>
Irwin, Brandon C	P1.156
Irwin, Jennifer	O3.1.1, P0.12
Iserbyt, Peter	O3.2.1
Ishii, Kaori	P3C.183
Ishikawa, Takuro	P1.195
Issartel, J	P2.101, P2.102
Issartel, Johann	P2.173, <u>P3b.153</u> , SO1.1.1
Ivarsson, Andreas	P2.86
Ivarsson, Anneli	P3.8
Izquierdo-Gomez, Rocio	P1.160
Jackson, Ben	P3.14
Jacob, Raphaëlle	P0.26
Jacoby, Enrique	S3.7.2
Jacques, Simon	<u>P1.24</u>
Jaddoe, Vincent	P2.48
Jago, Russ	P3C.185, <u>SO5.4.3</u>
Jago, Russell	O3.1.4, P0.112, P1.12, P2.116, S3.6.1, SO5.4.4
Jakubec, Lukas	P0.59
Jakubec, Lukáš	<u>P3C.240</u>
Jalaludin, Bin	O5.3.3
James, Erica	<u>P0.174</u> , <u>P2.71</u> , S9.3.1
James, Peter	<u>P3C.197</u>
Jämsä, Timo	P3C.169, P3C.215
Jancey, Jonine	SO2.4.6
Jankowska, Marta	S7.2.1, S7.7.1
Jannique, van Uffelen	P3b.163
Jansen, Elena	P0.183, P0.9, <u>P2.17</u> , <u>P2.25</u> , <u>P3b.26</u>
Jansen, Maria	P2.171, S2.5.4
Jansen, Marijke	<u>P3.134</u>
Jansen, Pauline	P2.48, SO6.4.7
Janssen, Ian	P1.182, P1.195
Janssen, Mark	P0.141, P0.142
Janssens, Heidi	P1.157
Janssen, Xanne	P2.216, <u>P3C.230</u> , <u>S6.6.1</u>
Jarman, Megan	P3b.34
Járomi, Melinda	P0.114
Jarrett, Traci	P3.138
Järvelä, Elina	<u>P0.103</u>
Jarvis, Jocelyn	P1.232
Jarvis, Jocelyn W	P1.102
Jason, Tim	P1.202, P2.174
Jauho, Anna	SO4.4.1
Jauho, Anna-Maiju	P3C.169
Jáuregui, Alejandra	P2.130
Jauregui, Edtna	P2.87
Jefferis, Barbara	P2.179, <u>SO6.2.3</u>
Jeffreys, Mona	P0.86
Jekauc, Darko	<u>P2.94</u>
Jenkin, Gabrielle	P1.25, P1.35
Jennie, Hill	SO5.1.4
Jennings, Cally	<u>P1.176</u> , P3.111, P3b.168
Jennings, Rose	O3.3.1
Jepson, Ruth	P2.148, P3C.186
Jewell, Karen	S4.3.1
Jhingran, Anuja	P1.173

Name	Presentation Code
Jiang, Yunnan	O1.1.5, O1.4.4, S8.3.1, S9.1.2
Jia, Wenyan	P1.5
Jiles, Kristina	P2.78
Jimba, Masamine	P0.7
Jing, Song	O4.1.3
Johansson, Unn-Britt	P3.130
John, Elinor	P2.226
John, Geraldine	P0.105
Johns, Emma	O6.3.3
Johnson, Andrew	O3.1.1
Johnson, Laura	O5.2.2
Johnson, Natalie	P0.174
Johnson, Steven T	P3.70
Johnson, Susan	O3.1.2, P1.43, P1.50, <u>P2.51</u>
Johnson, Tara	S9.1.4
Johnston, Craig	SO1.3.5
Johnston, Nora	P3b.168
Johson, Urban	P3.116
Jolly, Kate	<u>P1.222</u>
Jones, Amanda C	<u>P0.155</u> , <u>P0.156</u>
Jones, Andy	P1.158, P1.167, P1.169, P1.83, P3C.235, SO4.4.2
Jones, Andy P	O1.2.3
Jones, Jenni	P3C.227
Jones, Jessica	SO7.4.2
Jones, Kelly	S3.3.4
Jones, Marc	S6.1.3
Jones, Nathalie	<u>P2.232</u>
Jones, Rachel	P1.144, P1.208, P2.216, S5.2.2, <u>S5.2.4</u>
Jones-Smith, Jessica	P0.29, P2.31
Jones, Sonya	P2.38, SO4.1.2
Jones, Tim	O7.3.3
Jongenelis, Michelle	SO4.1.1
Jonsson, Linus	<u>P1.133</u>
Jørgensen, Sanne Ellegaard	P0.41
Jørgensen, Sanne Ellegård	<u>P1.57</u>
Jørgensen, Thea Suldrup	P1.57
Jørgensen, Torben	P2.214, P3b.150
Jørn Langøien, Lars	<u>S6.7.2</u> , S6.7.3
Josh, Grace	P1.204, P2.184
Jostmann, Nils B	S8.1.2
Jowett, Sophia	P3.136, P3.137
Joyce, Catherine	P0.158, P3C.171
Juaregui, Edtna	P1.182
Juhl, Hans Jørn	S7.6.2
Julián-Almárcegui, Cristina	SO6.4.2
Kaabi, Delfa	SO4.1.3
Kaaja, Elisa	<u>P3C.223</u>
Kaasalainen, Karoliina	<u>P1.198</u>
Kabir, Enamul	SO5.1.2
Kaczynski, Andrew	P2.158, <u>P2.55</u> , <u>S6.1.1</u>
Kahlmeier, Sonja	<u>P2.192</u> , <u>S2.1.1</u> , S9.2.2
Kalkwarf, Heidi	SO3.4.3
Kalman, Michal	P1.162
Kalter, Joeri	S9.3.4
Kalucy, Megan	P3b.33
Kamal, Atiya	P0.117
Kamphuis, Carlijn	P2.107
Kampman, Ellen	P1.230
Kampshoff, Caroline	<u>S9.3.2</u>
Kaner, Eileen	P3C.200
Kane, Sarah	S3.1.2
Kangas, Maarit	P3C.215, SO4.4.1
Kang, Daehee	P1.191
Kanning, Martina	<u>SO8.4.6</u>
Karagounis, Leonidas G	P2.217
Karfopoulou, Eleni	P0.168

AUTHOR INDEX K

Name	Presentation Code
Karhunen, Leila	P0.103
Karlsen, Anders	P2.185
Karlsson, Magnus K	P2.93
Kart Jacobsen, Rikke	P3b.150
Karunarathne, Waruni	P1.4, P2.7
Kasila, Kirsti	P1.198
Kasim, Adetayo	P0.85
Kasiyapat, Atchareeya	P3C.207
Kasstan, Ben	<u>P3.79</u>
Katapally, Tarun	<u>P0.62</u>
Kattelmann, Kendra	O4.3.5, P1.44, P1.72
Katzmarzyk, Peter	O1.3.4, O6.1.1, SO8.2.2
Kaukonen, Riikka	P2.205, <u>P2.33</u>
Kaulius, Megan	P1.111
Kaur, T	P1.140
Kavanagh, Anne	O4.3.2, SO1.4.4, SO1.4.6
Kayal, Arivudainambi	P0.14
Keadle, Sarah	<u>S2.7.2</u>
Keane, Eimear	P1.170, <u>P2.169</u> , <u>P2.27</u> , SO1.3.3
Kearney, Patricia	P1.170, P2.172
Kearney, Patricia M	P2.169, P2.27, SO1.3.3
Kearns, Ade	P0.138
Keefe, Margaret	SO7.4.8
Kee, Frank	O1.3.5, P0.20, P3C.212, P3C.241, S5.5.4
Keesling, Madison	P1.86
Kehlbacher, Ariane	S5.6.3
Kehler, Ainslie	<u>P3.121</u>
Keita, Akilah	<u>SO2.4.8</u>
Kelleher, Cecily C	S4.3.3
Keller, Carmen	P2.228, S7.6.3, <u>SO5.1.3</u>
Keller, Kathleen L	SO6.4.1
Kelly, Brian	O1.4.2, P3C.198
Kelly, Bridget	P2.14, P2.2, P3.2, <u>S3.4.1</u>
Kelly, Colette	P0.160, <u>P1.38</u> , P2.223, <u>P3C.227</u>
Kelly, Paul	P0.137, P0.167, P1.123, P2.147, S2.3.1, S7.7.2, SO1.3.6
Kelly, Rebecca	P1.49, P3.69
Kemper, Han CG	P0.159, P0.63
Kennedy, Katy	<u>P0.166</u>
Kennelly, Maria	<u>S4.3.3</u>
Kenny, Ursula	<u>P0.160</u> , <u>P2.223</u>
Keogh, Justin	P2.91
Keränen, Niina	P3C.215
Kerins, Claire	P3C.227
Kermarrec, Gilles	P1.126
Kernot, Jocelyn	<u>O2.3.2</u>
Kerr, Deborah	P0.31, <u>P1.56</u> , P2.39, P2.44, SO2.4.6
Kerr, Jacqueline	P2.131, S7.2.1, S7.7.1
Kersting, Mathilde	SO6.4.2
Kesten, Joanna	<u>O7.3.4</u> , P3C.189, <u>S3.2.4</u>
Kestens, Yan	P0.64, P1.129, S7.2.2
Kesztyüs, Dorothea	P0.90
Khalema, Ernest	SO3.1.2
Khalil, Maya	P0.1
Khan, Asad	<u>P1.200</u>
Khan, Asaduzzaman	P2.100
Khandpur, Neha	S6.2.1
Khan, Kaviul	P3C.219
KHANNA, PREETI	<u>P0.2</u>
Kharmats, Anna	S7.1.1
Kharrazi, Hadi	P0.43
Khawaja, Irfan	<u>O7.3.1</u>
Khoo, Selina	SO4.4.3
Khoury, Jane	SO3.4.3
Khunti, Kamlesh	P3C.191, P3C.220, S4.6.3
Kidd, Tanda	P1.72
Kieffe-de Jong, Jessica	P2.19

Name	Presentation Code
Kiely, John	P3.141
Kienteka, Marilson	S3.7.1
Kieusseian, Aurélie	P1.145
Kilian, Reinhold	P0.90
Kilpatrick, Michelle	<u>SO4.4.5</u>
Kimbrow, Rachel	SO1.3.5
Kim, Jang	S7.1.3
Kim, Yeon Jung	P1.191
Kim, Youngwon	P1.174, <u>P2.218</u> , <u>SO8.4.7</u>
King, Abby	P1.77, <u>S3.2.2</u>
Kingham, Megan	O1.3.3
King, Ken	O7.1.4
King, Lesley	S3.4.1
King, Neil	P2.75, P3.119, <u>P3.62</u>
King, Robert	P2.5
King-Shier, Kathryn	P3C.236
King, Tania	<u>O4.3.2</u> , <u>SO1.4.4</u>
Kinra, Sanjay	P3C.237
Kipping, Ruth	SO5.4.3, <u>SO5.4.4</u>
Kipps, Courtney	P1.110
Kirk, Alice	O8.1.2, P1.105
Kirk, Alison	P1.141, P2.138, P3b.144, <u>P3C.228</u>
Kirkpatrick, Sharon	<u>S1.5.2</u>
Kirk, Sara	P1.91, P2.40, P3.39
Kishimoto, Hiro	P2.210
Kispal, Lara	P2.36, P2.37
Kitas, George D	P1.210, P2.135
Kittel, France	P1.157
Kivimäki, Mika	P3C.182
Kjaer, Michael	P2.185
Kleinert, Jens	SO1.2.1
Klein, Michael	P3.13
Klepacz, Naomi	<u>SO7.2.3</u>
Knaeps, Sara	<u>O4.1.4</u>
Kneib, Thomas	O1.2.2
Knight-Agarwal, Catherine	<u>SO6.1.4</u>
Knight, Camilla	P0.102
Knowles, Ann-Marie	P2.138, P2.168, P2.227, <u>P3b.144</u>
Knowles, Zoe	O7.1.2, P0.175, P1.135, P1.138, P2.133, S7.3.3, SO8.4.3
Knox, Emily	<u>P1.112</u>
Knudsen, Louise Stjerne	<u>P0.34</u>
Knuiman, Matthew	O4.3.4, O5.1.4, P3b.166, SO2.4.5
Koch-Hansen, Pia	P2.231
Koch, Pamela	P1.76, P3.122
Koch-Weser, Susan	P1.69, P1.70
Koehly, Laura	S5.5.2
Koenings, Mallory	O4.3.5, P2.57
Koenings, Mallory M	P1.44, P2.76, P3.65, P3b.86
Koep, Tyler H	P0.120
Koh, David	P2.204
Kohn, Tertius	P1.223
Koivumaa-Honkanen, Heli	P3C.169
Kok, Gerjo	P2.122
Kokko, Sami	P1.123
Kolbe-Alexander, Tracy	P0.58, S2.1.2
Kolehmainen, Marjukka	P0.103
Koletszko, Berthold	P2.34, S5.1.2
Kolivras, Korine	P2.150
Kolt, Gregory	O5.3.3, P1.205, P1.214, P3.123
Kolt, Gregory S	<u>P2.164</u>
Komulainen, Jyrki	P1.198
Konda, Kurt	P1.85, P3.95
Kong, Kailing	SO6.1.2
Koning, Maaïke	O3.3.2
Konrad, Manuela	<u>P0.113</u>

AUTHOR INDEX K – L

Name	Presentation Code
Konstabel, Kenn	O1.2.2
Koohsari, Javad	S1.1.4, SO4.2.2
Koohsari, Mohammad	P1.184
Koolhaas, Chantal	P2.121, S2.5.3
Koorts, Harriet	P0.19
Kopp, Martin	P3C.221 , P3C.246
Koprowski, Carol	S4.1.2
Korpelainen, Raija	P3C.169, P3C.215, SO4.4.1
Korpela, Riitta	P0.103
Koseva, Mira	P0.87
Koski, Pasi	P1.123
Kotz, Daniel	SO1.3.1
Koupil, Ilona	P3.8, SO6.1.1
Krabbe, Ronja Lill	P0.16
Krapf, Fabian	O2.3.3
Krebs-Smith, Susan	S5.3.4
Kremers, Stef	P0.115, P1.17, P1.95, P1.99, P2.171, P3.73, S2.5.4, S4.7.4 , SO2.2.4
Kristensen, Dorthe Brogård	O6.3.4
Kroff, Jacolene	P1.223
Krølner, Rikke	P0.104, P1.57, P3.38
Krølner, Rikke	P0.41
Krukowski, Rebecca	O1.1.1
Kubik, Martha Y	P3.49
Kudlacek, Michal	P0.59
Kugelberg, Susanna	P3C.234
Kuhle, Stefan	P1.91, P3.39
Kujala, Urho	P1.123
Kukawadia, Atif	P1.232
Kukkonen-Harjula, Katriina	P3C.202
Kumagai, Shuzo	P2.210
Kunkel, Jule	P1.104
Kuo, Yi-Liang	P2.154
Küppers, Dennis	P3C.229
Kurita, Satoshi	P3C.183
Kuwahara, Keisuke	P0.89
Kuzik, Nicholas	P0.162, P1.188, P3b.160
Kwah, Kayleigh	P3.14
Kwan, Matthew	P3.132
Kwasnicka, Dominika	P3C.242
Kweku Dadson, Jeffery	P0.4
Kyryliuk, Rebecca	SO7.4.2
L'Abbe, Mary	P2.234, P3.21
Laberge, Suzanne	SO3.2.2
Lacerda Mendes, Edmar	P3C.193
Lachat, Carl	O5.2.5, S4.1.3, S8.2.2
Lacy, Kathleen	SO9.4.4
Laferte, Marilie	P0.78
Laferté, Marilie	SO1.1.4
Laffel, Lori	O2.1.1, O2.1.4, O2.1.5
Lafontaine, Anne-Louise	P3C.177
Lagarde, Francois	P0.78
Lagarde, François	SO1.1.4
Lagestad, Pål	P1.165, P2.144
Lahiri, Sudakshina	S2.4.2
Lähteenmäki, Liisa	S7.6.2
Laine, Hanna	P2.188, P3C.223
Laird, Yvonne	P2.147
Laitinen, Jaana	P0.103
Lake, Amelia	O2.2.1, P1.41, P1.66, P2.1 , P2.20, P2.21, P2.22, P3.75
Lake, M	P2.194
Lakerveld, Jeroen	O6.2.3 , P0.163, P2.215, S1.3.3, SO8.4.8, SO9.2.1
Lakshman, Rajalakshmi	P3b.28
Lakshman, Rajalakshmi	P2.84
Lalande, Gilles	P3b.89
Lamarche, Benoît	P0.26, P0.91, P1.24

Name	Presentation Code
Lambert, Estelle	O6.1.1, P1.223, S2.1.2
Lamb, Karen	P0.186, P0.80, SO2.1.1 , SO2.1.2
Lampek, Kinga	P0.114
Lancashire, Emma	O3.3.3, P1.93, P2.224, P3.51, SO5.4.6
Lancashire, Emma R	O9.3.3
Lander, Natalie	P3.97
Landrigan, Tim	S3.1.2
Landrigan, Timothy	P2.39
Lane, Aoife	P1.97 , P3b.164
Lane, Athene	P0.86, P1.108, P1.6
Langaaker, Aleksander	P1.139
Langberg, Henning	P0.38
Lanigan, Jane	P1.43, P1.50
Lanningham-Foster, Lorraine	P0.32, SO6.1.2
Lapointe, Annie	P1.24, P1.40
Lapointe, Marc	P2.233
Lappalainen, Raimo	P0.103
Lappas, Martha	P2.222
Laramée, Catherine	P0.26 , P1.24
Larivière, Céline	P3.63
Larivière, Michel	P3.63
Larouche, Richard	P1.150
Larsen, Torill	P2.85, P2.86
Larson, Nicole	P0.15, P2.229, P3b.152, SO2.2.3
Laska, Melissa	P2.65 , S3.3.3 , S4.2.4, SO2.2.3
Lassale, Camille	S5.3.3
Latimer-Cheung, Amy	P1.131, SO3.4.5
Latomme, Julie	S5.1.2
Latta, Laura	SO5.2.2
Lauer, Romy	P0.90
Lau, Morten	O1.3.5
Lauren, Banting	P3b.163
Laurence, Michelle	O7.1.4
Laursen, Bjarne	P1.55
Lavelle, Fiona	S4.2.2
Laverty, Anthony	P3b.161
Lawlor, Debbie	O3.1.4, SO5.4.3, SO5.4.4
Lawrence, Adair	P1.50
Lawrence, Natalia	S8.1.3
Lawrence, Wendy	P3b.34
Laws, Rachel	P1.29
Lawton, Julia	P0.20, P3C.212
Laxer, Rachel	O9.3.5
Laxer, Rachel E	P3C.199
Layte, Richard	P2.27
Leal, João	P0.145, P0.44, P3C.205
Lean, Michael Ernest John	P3b.22
Learnihan, Vincent	O5.1.3, SO4.2.3
Leask, Calum F	P3C.208 , P3C.209
Leatherdale, Scott	O9.3.5, P3.44
Leatherdale, Scott T	P3C.199
LeBlanc, Allana	SO8.2.2
LeBlanc, Claire	P2.160
Leblanc, Vicky	P1.224
Le Bodo, Yann	P1.100, SO7.2.4
Lecathelinais, Christophe	P0.124
Lechner, Lilian	P0.107, S2.2.2 , SO4.4.7
Leddington Wright, Sheila	P2.127
Leduc, PhD, Robert	SO1.4.3
Leduc, Caleb	P3.63
Lee, Alyssa	P3C.190
Lee, Amanda	S3.1.2
Lee, Andy	SO2.4.6
Lee, Chih-Ting	P1.125
Leech, Rebecca	SO9.4.4
Lee, Crystal	O8.3.4, SO2.2.2

AUTHOR INDEX L – M

Name	Presentation Code
Lee, Eun-Young	P0.83
Lee Gray, Heewon	P3.122
Lee, Hwi-Won	P1.191
Lee, Hyo-Joo	P1.191
Lee, I-Min	SO6.2.3
Lee, Jong-koo	P1.191
Lee, Jung Eun	P3.96
Lee, Jungwha	<u>O4.1.3</u>
Lee, Ling-Ling	<u>P2.154</u>
Lee, MinJae	O4.2.1
Lee, Miyoung	P1.191
Lee, Paul	<u>P3.3</u>
Lee, Rebecca	<u>P2.87</u> , P3.135
Lee, Rebecca E	<u>P1.182</u>
Lefevre, Johan	O4.1.4
Legat, Andrea	P0.113
Lehnert, Michal	P0.191
Lehto, Elviira	<u>P3b.35</u>
Lemaitre, Rozenn	P1.47
Lemieux, Simone	O8.3.5, P0.84, P1.224, P1.24, P1.40, P2.233, P3.6, P3b.31
Lemoine, Pablo	S1.1.1, S3.7.2
Lemoynes, Jean	P0.170
Lennon, Lucy	SO6.2.3
Lennon, Marilyn	O2.3.1
Leonard, Razwana	P3C.209
Leong, Jia Yan	P0.67
Leong, Sook L	P0.13
LeonGuerrero, Rachael	S7.1.3
Lepage, Ron	SO8.4.5
Leslie, Evie	P0.33
Leslie, Wilma	S9.7.1
Leung, May May	<u>O8.1.5</u> , <u>P1.96</u>
Leung, Steve	P3C.190
Leventhal, Adam	S4.1.2
Leversen, Ingrid	<u>P3C.180</u>
Levesque, Lucie	P1.182, P3.143, SO8.4.5
Lévesque, Lucie	P0.149
Levy, Louis	O6.3.3
Lewis, Beth	P0.126, P0.182
Lewis, Daniel	SO1.4.5
Lewis, Kiara	<u>P0.51</u>
Lewis, Lucy	O2.3.2
Liang, Ling-Yin	P0.147
Liang, Yan	S9.1.2
Lieffers, Jessica	<u>P3C.204</u>
Lien, Nanna	O1.4.5, P0.163, P2.205, P2.33, S1.3.3, S1.6.2
Liese, Angela	<u>P2.38</u> , <u>P3C.181</u> , <u>S3.3.2</u> , SO4.1.2
Li, Hung-Yuan	P1.34
Li, Kaigang	O4.1.1, O5.2.1
Lilley, Becky	P2.8
Lillico, Heather	P1.64
Lim, Clarise	S8.7.4
Lim, Wei Yen	P2.230
Lim, Yee Wei	P1.201, P2.230
Lin, Chu-Ru	P2.154
Lindgren, Urban	P3.8
Lindsay, Ana	<u>P0.68</u>
Lindsay, Karen L	S4.3.3
Lindsay, Robert	P3C.228
Lindwall, Magnus	O3.2.6, <u>P0.165</u> , P1.133, <u>S6.3.4</u>
Lin, Li-Chuan	P1.125
Linneberg, Allan	P2.214, P3b.150
Lin, Shyang-Woei	P2.154
Lioré, Sandrine	<u>P2.15</u> , P3.15, <u>P3b.83</u> , SO9.4.8
Lipsky, Leah	O2.1.1, <u>O2.1.4</u> , O2.1.5, O4.1.1, <u>O5.2.1</u>

Name	Presentation Code
Liu, Aiyi	O2.1.1, O2.1.5
Liu, Danping	O4.1.1, O5.2.1
Liu, Rebecca H	<u>P1.219</u> , <u>P1.220</u>
Liu, Yan	S2.4.3
li, xia	<u>P1.170</u> , P2.169, P2.172
Liyanage, Isurujith	P3b.24
Lloyd, Adam	O4.2.2, S6.2.3
Loeb, Mads Rohde	P2.185
Lohne-Seiler, Hilde	P3.117
Lohse, Barbara	<u>P1.11</u> , P2.52, <u>SO64.5</u>
Loitz, Christina	P1.176, <u>P3b.168</u> , SO3.1.2
Long, Dustin	P3.138
Longo, Alberto	O1.3.5
Longo, Mirella	S4.3.1
Long, Pang	P2.230
Lonsdale, Chris	P2.132, P3.123, P3C.217, <u>SO5.2.4</u>
Lopes, Adalberto	P1.181
LOPES, CLAUDIA	P3C.178
Lopes, Luís	P0.133
Lopez, Michael	<u>O8.1.2</u> , <u>P1.105</u>
Lopez-Taylor, Juan	P1.182
Lora, Karina	P0.177
Lorenzetti, Diane	S8.3.2
Loth, Katie	P0.15, SO7.4.6
Loughren, Elizabeth	<u>P0.164</u> , <u>P3.50</u>
Louie, Jimmy	P3.55, SO3.2.4
Louie, Jimmy Chun Yu	P2.14
Louie, Jimmy Chun-Yu	P3.2
Lou, Wendy	P2.234
Love, Penny	P0.19
Lowe, Fergus	P2.8
Lowry, Ruth	<u>P0.185</u> , P3C.222, P3C.233
Loyen, Anne	<u>P2.215</u>
Lu, Amy	<u>P0.30</u> , <u>P0.43</u>
Lubans, David	O1.4.3, O4.2.2, O6.1.3, P1.109, P1.152, P1.153, P2.71, P3.97, P3b.158, S2.7.4, S6.2.3, <u>S6.3.2</u>
Lubans, David R	P2.132
Luca, Bogdan	P1.83
Lucas, Hannah	S3.6.2
Luckman, Sophie	<u>P0.37</u>
Lu, Connie	P3C.219
Ludbrook, Anne	<u>S1.6.3</u>
Luduc, Robert	P1.19, P2.4
Lu, Karen	P1.173
Lukasse, Mirjam	P3.47
Lund-Cramer, Pernille	<u>P0.38</u>
Lund, Eiliv	P3C.196
Lungu, Ovidiu	P3C.177
Luszczynka, Aleksandra	P3b.91
Lutes, Lesley D	O8.3.2
Lutsey, Pamela	P1.47
Luziane, Oliveira	P0.154
Ly, Hieu	<u>P0.12</u>
Lynch, Amanda	<u>P1.75</u> , <u>P2.236</u>
Lynch, Brigid	SO3.1.3
Lynskey, Vanessa M	P0.10
Lyons, Séan	P2.27
Määttä, Suvi	P1.31, <u>P2.159</u> , <u>P2.201</u> , P2.205, P2.26
Ma, Ben	P3.100
Mabry, Ruth	<u>P1.184</u> , <u>P1.185</u>
Macaulay, Gus	S7.2.3
Macdonald, Mhairi	P1.211, <u>P2.151</u>
MacDonald-Wicks, Lesley	P1.226, P1.227
MacDougal, Jennifer	<u>S6.5.2</u>
MacGregor, Graham	<u>S8.3.4</u>
Machová, Iva	P0.191

AUTHOR INDEX M

Name	Presentation Code
Mackay, Graham	P0.122
MacKay, Jessie	P1.202, P2.174
Mackenbach, Joreintje	O6.2.3, O7.3.5 , S1.7.4 , SO9.2.1
Mackett, Roger	S3.7.3, S3.7.4
MacKinnon, Heather	P3.107 , P3.108
MacLean, Alice	SO9.2.3
MacLehose, Rich	SO7.4.6
MacLehose, Richard	O6.2.2, P0.15
MacLehose, Richard F	P3.49
MacLeod, Kate	P3.39
MacLeod, Roderick	P2.91
MacMillan, Freya	O5.1.1, P2.132
Macniven, Rona	P1.204 , P2.184 , S6.3.3
Macridis, Sultana	P0.123
Mactutus, Charles	O5.1.5
Maddison, Ralph	O1.1.5 , O1.4.4, S9.1.2, S9.2.3
Madigan, Claire	SO5.1.2
Maeder, Anthony J	P2.164
Maes, Lea	O1.4.5, O5.2.5, O5.2.6, S6.7.1, SO6.4.6
Magarey, Anthea	P0.183, P0.33, P2.13, P2.25
Magnussen, Costan	P1.49 , P3.69
Magnusson, Peter	P2.185
Maguire, Eva	P2.35
Mahanta, J	P1.140
Maher, Carol	O2.3.2, O7.1.5, P2.181, SO8.2.4
Mair, Jacqueline L	P2.207
Majumdar, Dalia	P3.140
Ma, Jun	P0.127
Makai, Alexandra	P0.114
Mak, Tsz Ning	P3b.25
Malanda, Belma	P0.14
Mallan, Kimberley	P0.183, P2.13 , P2.17, P3b.26
Malone, Stephanie	P0.116
Maltais, Danielle	P3.120
Maltais-Giguère, Julie	P1.224
Maltby, Alana	P0.98
Malvela, Miia	P1.198
Mamalaki, Eirini	P0.168
Mama, Scherezade	P3.135
Mammen, George	P3.118
Manackal, Tom	P1.5
Manichaikul, Ani	P1.47
Manios, Yannis	P2.34, S5.1.2, S5.2.3
Manley, Andrew	P3b.165
Mann, Kay	P1.53
Manns, Sarah	P3.41
Mansikkamäki, Kirsi	P3C.202
Manson, Heather	P1.102 , P1.232 , P1.64 , SO7.4.3
Mansoubi, Maedeh	P0.93
Mäntysaari, Matti	P3C.169
Marasi, Mohamadreza	P1.16
Marcotte, Meghan	O3.2.3
Margolin, Gayla	S4.1.2
Marie Ferrone, Elizabeth	P2.2
Mari, Véronique	P0.135
Markland, David	P0.165, P0.40
Markovic, Tania	O8.3.4
Marks, Jennifer	O1.4.6 , P3b.157
Marques, Marta	P0.176, P0.40
Marquis, Marie	P1.62, SO3.2.2
Marshall, Simon	O1.1.2
Martina, Andersson	S2.2.1
Martin, Anne	P0.106, P0.137 , P3C.186, P3C.229
Martin-Biggers, Jennifer	P1.44, P2.76 , P3.65, P3b.86
Martin, Corby	SO1.3.7
Martin, Emily	P2.126

Name	Presentation Code
Martínez-Blanco, Javier	P3C.244
Martínez-Gómez, David	P2.166
Martinez, Lauren	O4.2.6
Martinez, Yannica	P3.45
Martin-Fernandez, Judith	P3.15
Martin, Judith	P3b.83
Martin, Luc	S7.3.2
Martin, Richard	P0.86, P1.108, P1.6
Martins, Isabela	P0.154, P0.50
Mason, Erin	O4.3.1
Masse, Louise	S7.3.2
Mâsse, Louise	P1.32, P2.111, P2.113, P2.29 , P3b.29, S4.7.3 , S4.7.4
Massolo, Alessandro	S6.1.2, S8.7.3
Masters, Jonathan	P2.91
Masters, Kevin S	P2.146
Masterson, Daniel	S6.1.3
Mata, Jutta	P0.40, P2.72
Matei, Raluca	P2.179
Mathers, John	P2.1
Mathias, Kevin C	P2.217
Mathiot, Anne	P3C.237
Matthews, Anne	P0.70, P3.4, S7.7.2
Matthews, Cally	P1.48 , P3.11
Matthews, Charles	S2.7.2
Matthews-Ewald, Molly	SO3.2.3
Matthews, Joe	P0.164, P3.50
Matthews, Lynsay	P1.141 , S4.6.1 , S8.6.1
Matthews, Melissa	P2.57
Matthews, Stephen	S3.3.4
Mattocks, Calum	P0.94
Maulida, Rizka	P0.7
Mavoa, Susanne	S7.2.3
Mavoa, Suzanne	O5.1.2, O5.1.3, P2.203, P2.43, SO2.4.7, SO4.2.2, SO4.2.3
Ma, Xiaoguang	SO4.1.2
Maximova, Katerina	SO9.4.7
Maxwell, Douglas	P1.187
Maycock, Matthew	SO9.2.3
Mayo, Mariel Leah	P2.10
Mazarello Paes, Veena	P3b.28
Mazzochi, Mario	S1.6.2
Mazzucca, Stephanie	O3.1.5
Mbah, Pat	P2.66, P3.5
Mbah, Patricia	P3.43
McAllister, Megan	P2.125
McAuley, Edward	O2.3.4, P2.149
McAuliffe, Fionnuala M	S4.3.3
McCaffrey, Noel	P2.152
McCaffrey, Patricia	P2.140
McCann, Deborah	SO8.4.3
McCargar, Linda	SO7.2.1
McCarthy, Elizabeth	P2.222
McCarthy, Mary	S4.3.3
McClain, Amanda C	P3.19
McClain, James	P2.61
McComber, Alex	P3.143
McComber, Alex M	P0.149
McConnell, Jennifer	P1.163
McConnell, Kathryn	P3.75
McConnell, Whitney	O6.2.4
McCool, Barent	P3.68
McCormack, Gavin	P1.14 , S6.1.2 , S8.7.3
McCrorie, Paul	P2.138, P3C.235
McCullick, Bryan A	SO3.4.4
McCutcheon, Claire	P0.61
McDaniel, Tyler	O5.1.5

AUTHOR INDEX M

Name	Presentation Code
McDonald, Daniel	P3.54
McDonald, Gerren	P1.74
McDonald, Julia	O4.2.3
McDonald, Noreen	S14.3
McEachan, Rosemary	P2.77
McEvoy, Claire	P0.20, P3C.212, P3C.241
McEwan, Desmond	P1.111, S7.3.2
McFall, Suzanne	P1.93
McGannon, Kerry	P1.84
McGarty, Arlene	P3.94
McGavock, Jonathan	SO9.4.7
McGeechan, Kevin	O1.1.3, P1.15, P1.228, SO9.2.2
McGeorge, Sonia	P2.199, P2.200
McGillis, Zachary	P3.63
McGowan, Elizabeth	P1.75, P2.236
McGowan, Erin	P0.116, P3C.218, P3C.236
McGowan, Laura	S4.2.2
McGowan, Victoria	P1.2
McGrane, Bronagh	P2.101, P2.102, P2.173, P3b.153, SO1.1.1
McGregor, Suzanne	P1.60
McGuirt, Jared	P2.10, SO2.1.3
McHugh, Tara-Leigh	P3b.168
Mc Ilwee, Kyla	P3.56
McInnis, Katie	P1.33, SO1.3.8
McIsaac, Jessie-Lee	P1.91, P3.39
McKay, Ailsa	P3b.161
McKay, Heather	P1.149, P1.177, P2.125
McKay, Heather A	O5.3.4
McKechnie, Jim	P1.124
McKenna, Jim	P1.60, P3b.165, SO3.4.8
McKenzie, Thomas	P0.88
McKinley, Michelle	P0.20, P1.65, P3C.212, P3C.241
McLaren, Lindsay	S8.3.2, S8.3.3
McLean, Rachael	P1.25
McLean, Rebecca	S8.3.1
McLennan, Elizabeth	P0.37, P0.61
McLeod, Nicole	P3b.168
McMahon, Siobhan	P0.126, P0.182
McMichan, Lauren	P2.168
McMillan, Kathryn A	P2.168
McMorris, Barbara	P1.45
McMurdo, Marion	P2.148
McNamee, Lily	P2.147
McNaughton, Sarah	O6.2.5, P1.46, P1.48, P3.10, P3.11, P3.7, P3.9, S4.2.3, SO9.4.4
McNeill, Geraldine	P0.171
McNeill, Lorna	P3.135
McNeilly, Andrea	P2.177
McQuillan, Ruth	P0.66
Mc Sharry, Jenny	P0.82
McVey, Gail	SO7.4.3
M. de Wit, Leonore	P2.134
Mead, Gillian	P2.197
Mears, Ruth	S3.6.1
Mechant, Peter	P2.106, P2.108
Medeiros Rataichesk Fiates, Giovanna	P0.11
Medina, Catalina	P2.130
Meendering, Jessica	P3.61, P3.76
Meester, Hante	O2.1.3
Meg, Skizim	P3C.243
Mehling, Christine	P3C.204
Mehta, Sanjeev	O2.1.1, O2.1.4, O2.1.5
Meisel, José	S3.7.2
Mellecker, Robin	S9.1.4
Melling, Chris	S8.6.1

Name	Presentation Code
Mello, Jennifer	SO1.4.7
Mellone, Sabato	P2.189, P3.133
Mello Rodrigues, Vanessa	P0.11
Melville, Craig	P2.232, P3.94, S8.6.1
Menai, Mehdi	P2.198
Mendes, Shirlei	P0.50
Mendoza, Albert	SO3.4.2
Mendoza, Julio	P2.234
Meneguci, Joilson	P0.150
Menezes, Aldemir Smith	P0.150
Meng, Rosie	O2.2.4
Meng, Xingqiong	P0.31, P2.44
Mensah, Keitly	S1.3.3
Mensink, Frédérique	S8.1.1
Merchant, Gina	O1.1.2
Merom, Dafna	P1.122
Mertens, Lieze	S1.4.2, S7.7.3
Mess, Filip	P0.172
Metcalfe, Chris	P1.6
Metsios, George S	P1.210, P2.135
Meyer, Craig	O6.2.2, SO7.4.6
Micali, Nadia	P2.48
Michels, Nathalie	O6.2.1, S4.7.4, S8.2.1
Middelweerd, Anouk	O6.1.4, P2.124
Mikhail, Dalia	P0.120
Mikkelsen, Bent Egberg	O2.2.2, O6.3.4
Miller, Andrew	S6.2.3, S6.3.2
Miller, Margaret	O2.2.4, O9.3.2, O9.3.4
Millett, Christopher	P3b.161
Mills, Daniel	P0.188
Milosavljevic, Marianna	P2.14
Milte, Catherine	P1.46, P1.48, P3.10, P3.11, P3.7, P3.9
Milton, Karen	P0.167, P0.181, S9.2.2, SO3.1.4, SO8.2.1
Minaker, Leia	O8.1.4
Miner, Hannah	P2.55
Mishra, Gita	SO6.1.1
Misyak, Sarah	S4.1.1
Mitas, Josef	P0.130, P0.146, P0.48
Mitáš, Josef	P0.148, P1.179
Mitchell-Bennett, Lisa	O4.2.1
Mitchell, Fiona	S8.6.1
Mitchell, Iain A	SO3.4.4
Mitchell, Jonathan	S5.7.1
Mitchell, Paul	SO3.2.4
Mitrou, Panagiota	S5.3.2
Mizdrak, Anja	P0.72, S5.6.1, S5.6.4
Mizoue, Tetsuya	P0.89
Moak, Emily	P1.96
Mobley, Amy	S6.2.2
Moeijes, Janet	P2.104
Moetteli, Sonja	SO1.2.3
Mohamad, Hamdan	P0.171
Mohammed, Mohammed	P3C.198, S2.3.3
Mohan, V	P1.140
Mohan, Viswanathan	P0.14
Mohebbi, Mohammadreza	P0.19
Molcho, Michal	P0.160, P1.38, P2.223
Molina-García, Javier	P0.74, P0.75, S8.5.2
Möller, Peter	P3.130
Mommio Study Group, the	S2.4.1
Mongeau, Lyne	O8.3.5, P1.100, P1.231
Monsivais, Pablo	P2.35, S6.7.3
Montanha, Tiago	P0.25
Montemurro, Genevieve	P3C.219
Montes, Felipe	S3.7.2
Monyeki, Makama Andries	P0.159, P0.63

AUTHOR INDEX M – N

Name	Presentation Code
Moon, Graham	SO2.1.4
Moon, Jon	P1.42
Moore, Helen	O2.2.1, P0.169, P1.116, P1.199, P2.22, P2.84, P3b.28, SO1.3.6
Moore, Melissa	<u>P0.53</u>
Moore, Page	O4.2.5
Moore, Sarah	<u>P0.20</u> , <u>P3C.212</u>
Moore, Spencer	P0.149
Moore, Susannah	<u>P0.27</u>
Moor, Irene	O6.3.2
Morales, Maricruz	P2.130
Moran, Mika	S3.2.2
Moreau, Elizabeth	P2.160
Moreira, Carla	P0.133
MOREIRA, NAIARA	P3C.178
Moreno, Jennette	SO1.3.5
Moreno, Luis	P1.233, P2.34, S5.1.2
Moreno, Luis A	O6.2.1, SO6.4.2
Moresi, Sofie	P0.141, <u>P0.142</u>
Morgan, Philip	O1.1.1, O1.4.3, O3.2.4, <u>O4.2.2</u> , O6.1.3, P1.109, P1.152, P1.153, P2.70, P3.57, P3.97, P3b.158, P3b.85, <u>S6.2.3</u> , S6.3.2
Morgan, Philip J	S3.6.2
Morin, Isabelle	<u>P1.224</u>
Morisset, Anne-Sophie	<u>P0.118</u> , P0.36
Morris, Amanda	P0.177
Morrison, S	S8.1.3
Morris, Stephanie	<u>P1.213</u>
Morris, Tony	SO4.4.3
Morssink, Christiaan	P0.3
Morton, Katie	<u>S7.3.1</u>
Moshtaghian, Hanieh	<u>SO3.2.4</u>
Moss, Sarah J	P0.159, P0.63
Mota, Jorge	<u>P0.133</u> , <u>P0.25</u> , P2.155, <u>P2.96</u> , P3C.193, P3C.194, SO5.4.5
Motl, Robert	O2.3.4
Mötteli, Sonja	S7.6.3
Mottola, Michelle F	<u>P3.64</u>
Moug, Susan	<u>P0.122</u> , P0.37, P0.61
Mouratidou, Theodora	P3b.25, SO6.4.2
Mucci da Conceição, Leticia	P1.71, P2.219
Mudde, Aart N	SO4.4.7
Mudd, Lanay	<u>P3C.187</u>
Mueller, Barbara	SO7.2.2
Mueller, Megan P	P0.10
Mugharbel, Anas	P0.1
Muhajarine, Nazeem	P0.62
Muhammadi, Shakiba	P1.96
Mui, Yeeli	S7.1.1
Mukhopadhyay, Susmita	P0.18
Müller, Andre	<u>SO4.4.3</u>
Müller-Riemenschneider1, Falk	<u>P2.209</u>
Müller-Riemenschneider, Falk	P1.201, <u>P2.204</u>
Mullie, Patrick	P1.73
Mullin, Megan	<u>P2.57</u>
Mumford, Elizabeth	O5.2.4
Mummah, Sarah	<u>P1.77</u>
Mummery, Kerry	P2.95, SO4.4.4
Mummery, W Kerry	P1.176, P3b.168
Murnaghan, Donna	P3C.236
Murphy, Joseph	<u>P3.109</u>
Murphy, Marie	P2.162, P2.177, S1.6.3, S2.3.3
Murphy, Marie M	<u>P2.207</u>
Murphy, Maureen	P2.43
Murphy, Niamh	P1.97, P3b.164
Murphy, Rebecca	P3C.195

Name	Presentation Code
Murphy, Simon	SO5.4.7
Murray, Heather	S8.6.1
Murtagh, Elaine	<u>S2.3.3</u>
Mussap, Alex	P0.76, P3C.213
Mussio, Flaminia	P3b.25
Musson, Hayley	P1.112, <u>P1.119</u> , P2.105
Mustafa, Karim	P0.120
Must, Aviva	P1.69, P1.70
Mutrie, Nanette	P0.122, P0.137, P1.141, P1.148, P3.48, P3C.186, S8.6.1
Myers, Anna	<u>O1.3.2</u>
Myers, Candice	SO1.3.7
Myers, Valerie	SO3.2.3
Mytton, Julie	<u>P3.41</u>
Mytton, Oliver	<u>P2.153</u> , SO9.4.1
Nadeau, Alexandra	P3C.177
Nagel, Catherine	P0.88
Nagpal, Taniya	P3.64
Nagy, Liana	P0.132, <u>P3C.198</u>
Nair, Madhavan	O6.1.5
Naja, Farah	P0.1
Nakagawa, Tohru	P0.89
Nakornkhet, Kasem	P3C.207
Nalecz, Hania	P3.115
Nang, Ei Ei Khaing	P0.105
Nanishi, Keiko	P0.7
Nanney, RD, PhD, Marilyn (Susie)	SO1.4.3
Nanney, Marilyn	P1.19
Nanney, Marilyn S	P2.229, P2.5, <u>P3.49</u> , S5.1.1, <u>SO4.2.1</u>
Nanney, Mariyln	P2.4
Nansel, Tonja	<u>O2.1.1</u> , O2.1.4, <u>O2.1.5</u> , O5.2.1
Nasar, Jack	S7.7.3
Nash, Robert	SO7.2.3
Nasreddine, Lara	P0.1
Nasstasia, Yasmina	O1.4.2
Natarajan, Loki	P2.131
Nathan, Nicole	O6.1.3, P0.124, P1.152, P1.153, <u>P2.41</u> , <u>P2.42</u> , P3b.158, P3C.188
Naylor, Patti-Jean	P1.163, <u>S4.1.4</u>
Nazare, Julie Anne	S1.3.3
Ndao, Amadou	P0.99
N'Dow, James	P0.171
Neal, Bruce	P3.2, S8.3.1, S8.3.3
Neal, David	P1.108, P1.6
Nebeling, Linda	O2.2.3, P1.132, P1.180, P1.215, <u>P1.216</u> , P1.68, P2.61, P3b.81, SO5.4.2
Neeson, Megan	O2.2.4
Nelson, Michael	S7.7.2
Nelson, Miriam	S3.6.3
Nelson, Stephanie	P2.65
Nelson, Toben F	P3.49
Nemic, Cori	P1.103
Nettel-Aguirre, Alberto	P1.14
Netuveli, Gopalakrishnan	P0.111
Neuls, Filip	P3C.240
Neumark-Sztainer, Dianne	O2.1.2, O6.2.2, P0.15, P3b.152, SO2.2.3, SO7.4.6
Nevill, Alan	S2.3.3
Nevill, Alan M	P3.129
Neville, Charlotte	P3C.241
Newham, James	<u>P3C.200</u>
Newton, Robert	SO3.2.3
Ngan, Winsfred	P3.71
Ng, Hui Xian	P2.204
Ng, Norman	<u>P0.81</u> , P3b.156
Ng, Shu-Kay	P1.52
Nguyen, Nga	P3.135
Nic Gabhainn, Saoirse	P1.38

AUTHOR INDEX N – P

Name	Presentation Code
Nichols, Linda	S2.3.3
Nicolaou, Mary	S6.71, S6.73
Nield, Lucie	<u>P0.134</u>
Nielsen, Annemette	O3.3.4, <u>S7.5.3</u>
Nielsen, Maria Juul	P0.16
Nierman, Christina	P3.73
Niermann, Christina	<u>O2.3.3</u> , P3C.224
Nieuwenhuijsen, Mark	P2.192, S6.1.3
Nigg, Claudio	P3.45, S71.3
Nijziel, Marten	S9.3.2
Nikolaou, Charoula-Konstantia	P3b.22
Nilsson, Karina	P3.8
Nimegeer, Amy	<u>S3.2.1</u>
Ni Mhurchu, Cliona	O2.2.5, O8.1.1, <u>S5.6.1</u> , S5.6.4, S8.3.1
Nimmo, Myra	S4.6.3
Ninov, Lyudmil	P0.14
Niven, Ailsa	P0.137, <u>P1.211</u> , P2.147, P2.151
Njoku, Victoria	P0.86
Nnoaham, Kelechi	S5.6.1
Nobari, Tabashir	<u>P2.59</u>
Noble, Sian	SO5.4.4
Nobre, Inês	P0.47
Nogueira, Helena	P0.139, <u>P3C.173</u>
Nogueira Pizarro, Andreia	SO5.4.5
Noonan, Robert	O7.1.2, <u>P1.138</u> , P2.133
Norman, Åsa	<u>P2.63</u>
Norman, Greg	O1.1.2
Norris, Colleen	P1.84
Norris, Emma	<u>O1.4.1</u>
Norris, Shane	P3C.189
Norris, Sigrid	S3.5.4
Northrup, Karen	P3.138
Nour, Monica	<u>P1.15</u>
Novotny, Rachel	<u>S71.3</u>
Ntani, Georgia	SO2.1.4
Ntessalen, Maria	<u>P0.171</u>
Ntoumanis, Nikos	P0.46, P1.210, P2.135
Nugent, Chris	P2.207
Nutbeam, Don	S6.3.3
N. Vik, Frøydis	O1.4.5
Nwaokemeleh, Ogechi	SO3.4.2
Nyberg, Gisela	P2.63
Nygård, Clas-Håkan	P3C.202
Nykiforuk, Candace	P0.123, P1.120
Nykodým, Jiří	P1.179
O'Reilly, Norman	SO3.4.5
O'Sullivan, J	S8.1.3
Oakes, J Michael	P0.126, P0.182
Oakley, Anthony	S6.2.3
O'Brien, Catherine	S6.3.1
O'Brien, Mary	P1.64, SO7.4.3
O'Brien, Nicola	P2.16
O'Brien, Orna A	S4.3.3
O'Brien, Wesley	<u>P2.140</u> , <u>P2.142</u> , P3b.153
O'Carroll, Ronan	P3b.82
Ochoa-Aviles, Angelica	S4.1.3
O'Connell, Michael	P3.49
O'Connell, Rebecca	<u>S7.5.2</u>
O'Connor, Niamh	P1.148
O'Connor, Teresia	<u>P1.32</u> , P2.111, P2.29, P2.87, S4.7.3, S4.7.4, SO1.3.5, <u>SO3.4.7</u>
O'Connor, Teresia M	P2.12
Oddy, Wendy	P3C.184
O'Donnell, Chris	P2.103
O'Donnell, Christopher	P1.124
O'Donoghue, Grainne	<u>S1.3.3</u>

Name	Presentation Code
O'Dwyer, Mareesa	P1.135
Oenema, Anke	S2.2.2
Ogata, Niwako	S8.7.2
Ogden, Nancy	P1.188, P3b.160
Ogilvie, David	O7.3.1, O7.3.2, O7.3.3, O7.3.4, P0.80, P0.94, P0.95, P1.137, P2.153, S3.2.1, S3.2.4, S3.7.3, S3.7.4, SO1.1.3, SO3.1.1
O'Gorman, Donal	S1.3.3, S1.6.2
Ogunleye, Ayo	P1.175
Oh, April	O2.2.3, P1.132, <u>P1.180</u> , P1.215, P1.216, P1.68, P2.61, <u>P3b.81</u> , SO5.4.2
O'Hara Tompkins, Nancy	P3.138
Ohri-Vachaspati, Punam	SO7.4.4
Oja, Pekka	<u>P1.123</u>
Oka, Koichiro	P3C.183
Okely, Anthony	O6.1.3, P1.152, P1.153, P1.208
Okely, Tony	P2.216, S5.2.1, S5.2.4
Olander, Ellinor	<u>P3.72</u>
Oldmeadow, Christopher	P2.71
Olds, Tim	P2.181
Olds, Timothy	O2.3.2, O7.1.5, P0.33, SO8.2.4
O'Leary, Emer	<u>P2.152</u>
Olfert, Melissa	P1.72
Oliffe, John	P3.70
Oliphant, Raymond	P0.61
OLIVEIRA, ALDAIR	P3C.178
Oliveira, Elusa	P0.194
Oliveira-Santos, José	P0.133
Oliver, Melody	P2.203
Olson, Christine	<u>P3b.84</u>
Olson, Christine M	<u>S4.3.2</u>
Olsson, Viktoria	P1.8
Olstad, Dana	P0.123
Olstad, Dana Lee	<u>P1.120</u> , <u>SO7.2.1</u>
Olupeliyawa, Asela	P1.4, P2.7
Oluwasanu, Mojisola	P0.66
O'Malley, Claire	<u>P0.169</u> , P2.84, <u>P3b.28</u>
O. Mensah, Faustina	P0.4
Ommundsen, Yngvar	P2.85, P2.86
., on behalf of WP 21 of the DEDIPAC project	SO1.3.2
O' Neill, Cian	P2.142
Ong, Ken	P3b.28
Ong, Kok-Leong	P1.29
Onywera, Vincent	O6.1.1
Oppert, Jean Michel	<u>S1.3.4</u>
Oppert, Jean-Michel	P1.145, P2.198
Oreskovic, Nicolas	<u>O1.2.5</u> , O1.2.6
Orloski, Alexandria	S4.7.1
Ortiz, Luis	P1.182
Østergaard Nielsen, Rasmus	P0.38
O'Sullivan, Teresa	P1.51
Otahal, Petr	O6.2.5, O6.2.6
Ouellet St-Hilaire, Geneviève	<u>P0.91</u>
Ouellette, Anne Sophie	<u>P2.233</u>
Overby, Hilary	P3.61, <u>P3.76</u>
Øverby, Nina	P3.117
Øverby, Nina C	P1.30, P1.7, SO6.1.3
Owen, Neville	P1.184, S1.1.3, <u>S1.1.4</u> , SO2.4.1, SO3.1.3, SO4.2.2
Oyeyemi, Adewale	S1.1.1, S1.1.4
Ozakinci, Gozde	P3C.190
Pacheco da Costa Proença, Rossana	P0.11
Padez, Cristina	<u>P0.139</u> , P0.54, P3C.175
Paes, Veena	P2.84
Page, Angie	O5.3.5, P1.83, P2.123, P2.178, S5.7.2, S5.7.3
Painchaud Guérard, Geneviève	<u>P3b.31</u>
Palaniappan, Latha	O1.1.4

AUTHOR INDEX P

Name	Presentation Code
Pal, Baidyanath	P0.18
Palermo, Claire	S3.1.2
Pallan, Miranda	O3.3.3, P1.93, P2.224, P3.51, SO5.4.6
Pallan, Miranda J	O9.3.3
Palmeira, António	P0.145, P0.40, P0.44, <u>P1.118</u> , <u>P3b.162</u> , P3C.205
Palmeira, António L	P0.47
Palmer-Keenan, Debra	<u>P3.140</u>
Pang, Bonnie	O5.1.1
Panther, Jenna	O1.2.3, <u>O7.3.1</u> , O7.3.2, P0.94, P1.137, P2.153, S3.7.3, <u>S3.7.4</u>
Paolilli, Tammi	<u>P1.168</u> , P3.139
Paolilli, Tammi M C	P1.156
Papachristopoulou, Alexia	SO9.4.6
Papadaki, Angeliki	<u>P1.12</u>
Papaioannou, Athanasios	<u>SO1.1.2</u>
Paquette, Marie-Claude	<u>O6.3.5</u> , O8.3.5, P1.231, <u>SO3.2.2</u>
Parker, Kate	P2.183, S6.1.4
Parker, Louise	P1.43
Parker, Philip	P2.132, P3.123
Parker, Tassy	P3.78
Park, Ginger	P3.95
Parkinson, Kathryn	P3C.230
Park, Saengryeol	<u>P0.46</u>
Parlesak, Alexandr	<u>S3.1.1</u>
Parmer, Arpita	P3.132
Parrish, Anne-Maree	P1.208
Parslow, DM	S8.1.3
Parsons, Tessa	SO6.2.3
Partridge, Stephanie	P1.15, P1.228, SO2.2.2
Partridge, Stephanie R	<u>O1.1.3</u> , <u>SO9.2.2</u>
Pasco, Denis	P1.126
Pasquet, Patrick	P0.99
Passaro, Erin	P1.79
Patel, Asmita	<u>P2.91</u>
Pate, Russel	S5.7.1
Pathirana, Ashan	P3b.24
Patrick, Heather	P1.180, P1.215, SO5.4.2
Patrick, Kevin	O1.1.2
Patterson, Amanda	P1.226, P1.227
Patterson, Emma	<u>O6.3.1</u>
Patterson, Kira	<u>O6.2.6</u>
Paul, Ian	P3b.88
Paulussen, Theo	P2.122
Pavey, Toby	<u>P0.58</u> , P0.81, P2.68
Pavey, Toby G	S2.3.2
Pawlowski, Charlotte	<u>P2.82</u>
Payne, Sarah	S2.3.1
Pearce, Jamie	P0.55
Pearce, Mark	P1.53, P3C.230
Pearce, Matthew	P1.211
Pearson, Natalie	P0.93, <u>P2.199</u> , <u>P2.200</u> , P3C.220, S3.5.1
Pedersen, Trine Pagh	P0.41, P1.55
Pediscic, Zeljko	<u>P0.181</u> , P2.211
Peels, Denise	S2.2.2
Peels, Denise A	P0.107, SO4.4.7
Peeters, Anna	P0.158, P3C.171, SO2.2.1
Pelclová, Jana	P0.191
Pella, Marjolaine	P1.224
Pellegrini, Christine	O4.1.3
Pellegrini, Christine A	P1.229
Pelletier, Jennifer	S3.3.3
Pelligrino, Nicole	P3C.243
Pelssers, Johan	SO6.2.1
Penfold, Chris	<u>P1.108</u>
Penney, Tarra	P1.91, P3.39
Penney, Tarra L	<u>P2.35</u>

Name	Presentation Code
Penn, Linda	P2.20
Penpraze, Victoria	P3.94
Pentecost, Claire	P2.157
Peralta, Louisa	O9.3.1, P1.10
Perkins, Heidi	P2.126
Perna, Frank	<u>P2.61</u>
Perrier, Marie-Josée	P2.128
Perron, Julie	P0.84
Perry, Catherine P	P2.27, <u>SO1.3.3</u>
PERRY, IVAN	P2.172
Perry, Ivan J	P2.169, P2.27, SO1.3.3
Persad, Raj	P0.86
Peterseil, Marie	P0.113
Peters, Ellen	P2.72
Petersen, Christina Bjørk	<u>P0.131</u>
Peters, Tim	SO5.4.3, SO5.4.4
Pettigrew, Simone	<u>SO3.2.1</u> , <u>SO4.1.1</u>
Pettit, Chris	S7.2.3
Pfaeffli Dale, Leila	O1.1.5
Pfammatter, Angela F	P1.229
Pfeiffer, Karin	SO3.4.2
Pförtner, Timo-Kolja	O6.3.2
Pham, Truc	P1.32, P2.29
Phillips, Beatrice	P1.72
PHILLIPS, CATHERINE	P2.172
Phillips, Lisa	<u>P1.207</u>
Phongsavan, Philayrath	O1.1.3, P0.181, P1.228, SO9.2.2
Pierik, Frank	P2.107, P3.134
Pierret, Chris	P0.120
Pierret, Victoria A	P0.120
Pigeot, Iris	O1.2.2, O6.2.1, S4.6.2
Pina, Maria de Fatima	P2.155
Pinard, Courtney	P2.30, SO4.1.4
Pinket, An-Sofie	<u>P2.34</u>
Pinkney, Susan	O6.3.3
Pinto, Daniel	O4.1.3
Pirkey, Paige	P3.52
Pitt, Erin	P1.52
Pitts, Stephanie	P2.10, SO2.1.3
Pizarro, Andreia	P2.96
Plaete, Jolien	S2.2.4
Plancoulaine, Sabine	P2.15
Playle, Becky	S4.3.1
Plotnikoff, Ron	P0.174
Plotnikoff, Ronald	O1.1.1, O3.2.4, O4.2.2, P1.109, P3.111, P3.57, <u>P3C.176</u> , S9.3.1
Plouffe, Jacques	P3.120
Plumlee, Catherine	P1.88, S6.5.3
Pohlig, Ryan	P0.147
Pollard, Christina	O2.2.4, <u>P0.31</u> , P1.56, P2.39, P2.44, S3.1.2
Polman, Remco	P3b.149
Poltawski, Leon	SO5.1.1
Pomerleau, Sonia	P0.91, P3b.31
Ponty, Amandine	P0.99
Popescu, Andrei Alin	P1.83
Pope, Zachary	P3.96, S9.1.1, S9.1.3
Popo, Emma	<u>P2.224</u>
Poskiparta, Marita	P1.198
Poston, Lucilla	P2.118
Potratz, Christa	O3.3.1
Powell, Austin	P1.75, P2.236
Powell, Cormac	<u>P0.178</u>
Powell, D	P2.101, P2.102
Powell, Danielle	<u>P2.173</u> , P3b.153, SO1.1.1
Powell, Elisabeth	P0.9
Powell, Emma	<u>P3.129</u>

AUTHOR INDEX P – R

Name	Presentation Code
Powell, Jane	O7.3.3
Powell, Katie	S6.7.1, S6.7.3
Powell, Lisa	S3.3.4, <u>S5.6.2</u>
Powell, Rachael	SO6.2.2
Power, Kevin	P3C.218
Power, Thomas	P1.43, P1.50, S4.7.2, S4.7.4
Power, Thomas G	P2.12
Pradeepa, R	P1.140
Pradeilles, Rebecca	<u>P3C.189</u>
Prado, Crisley	P1.181
Prajaknate, Pornpun	<u>P0.77</u>
Pranata, Ilung	P3b.85
Prapavessis, Harry	P2.208, P3.64, SO1.2.4
Pratt, Charlotte	O4.1.1
Pratt, Iain	SO4.1.1
Pratt, Iain S	SO3.2.1
Pratt, Keeley	<u>P1.101</u> , P2.220
Prémusz, Viktória	P0.114
Presseau, Justin	P3C.200
Price, Mike	P2.127
Prichard, Ivanka	S5.5.2
Prince, Ron	P3b.90
Prince, Ronald	P3.78
Prins, Richard	<u>O7.3.2</u>
Probst, Yamine	SO3.2.4
Provencher, Véronique	O8.3.3, O8.3.5, P0.190, P0.26, P0.91, P1.231, P1.62, P3b.31, P3C.231
Prowse, Rachel	SO7.2.1
Pryce, Robert	P1.74
Pugh, Caitlin	P1.149
Puhkala, Jatta	<u>P3C.202</u>
Puleo, Elaine	SO3.4.2
Pulker, Claire	P0.31, P3C.239
Pulsford, Richard	<u>O4.1.2</u> , <u>P2.202</u>
Puma, Jini	P0.136, P3C.226
Punjabi, Khushboo	P3b.168
Purakom, Atchara	<u>P3C.207</u>
Purves, Richard	<u>S4.5.2</u>
Puttonen, Sampsa	P0.103
Puyat, Joseph	P2.125
Pyky, Riitta	<u>P3C.169</u> , SO4.4.1
Qian, Wei	P3C.199
Qi, Ying	P2.234
Quatela, Angelica	<u>P1.226</u> , <u>P1.227</u>
Queralt, Ana	P0.74, <u>P0.75</u> , S8.5.2
Quested, Eleanor	SO1.1.2
Quick, Virginia	P1.44
Quigg, Robin	P1.23
Quinn, Christopher	O8.1.3
Raats, Monique	P0.73, P3.4, P3C.211, SO7.2.3
Rachele, Jerome	O5.1.2, SO2.4.7, <u>SO4.2.3</u>
Racine, Elizabeth	<u>O5.2.4</u> , SO1.3.4
Radel, Rémi	P0.135
Radhakrishna, K	O6.1.5
Radley, Andrew	SO6.4.1
Raine, Kim	O8.1.4, <u>P0.123</u> , P1.120, SO7.2.1
Rainham, Daniel	P0.173, P0.62, P1.202, P2.174, P3C.232
Rajaeieh, Golnaz	<u>P1.16</u>
Ramanathan, Subha	S6.3.1
Ramsay, Andrew	O2.3.1
Randal, Ed	O7.3.5
Randel, Allison	P1.115
Rangan, Anna	P3.55
Ranjit, Nalini	O3.3.1, O4.2.4, P1.103, P1.105, P1.33, P2.58, SO1.3.8, SO7.4.5, SO7.4.7
Raposo, Frederico Z	<u>P0.47</u>

Name	Presentation Code
Rasmussen, Mette	<u>P1.55</u> , P3.38
Rastatter, Sarah	S7.1.1
Rault, Dawn	S8.7.3
Rau, Mandy Kim	P3C.229
Rawlins, Emma	SO5.4.3
Ray, Carola	<u>P1.31</u> , P2.159, P2.201, P2.205, <u>P2.26</u> , P2.33, P3b.35
Rayner, Mike	P0.11, P0.72, P3.4, S5.6.1, S5.6.4
Raynor, Hollie	P3C.172
Rebar, Amanda	<u>S2.2.1</u>
Rebar, Amanda L	P2.164
Reed, Debra	P2.69, P3.68
Reeder, Bruce	P2.163
Reeve, Charlie	SO1.3.4
Reicks, Marla	<u>S4.2.4</u>
Reid, Robert	P3C.236
Reidy, Kathleen	P2.45
Reilly, Jessica	P3C.230
Reilly, John	P2.216, P2.227, P3C.230
Reilly, John J	P0.106, SO3.4.4
Reilly, Kathryn	P2.42, P3C.188
Reilly, Kristen	<u>P3.17</u>
Reiner, Marina M	P2.142
Reinhart, Gregory	O6.1.5
Reininger, Belinda	<u>O4.2.1</u>
Reis, Rodrigo	<u>P0.101</u> , P1.181, <u>S1.1.1</u> , S1.1.2, S3.7.1
Reitzel, Lorraine	P3.135
Renders, Carry	P3.77
Renner, Britta	S1.6.2, SO1.3.2
RENNIE, KIRSTEN	P2.172
Repka, Emil	P1.179
Research Group, Healthy Children Strong Families	P3.78
Research Group, ISCOLE	O6.1.1
Research Team, Project SMART	O1.1.2
Rhodes, Ryan	P3C.236, S4.1.4, <u>S8.7.4</u> , <u>SO3.4.5</u>
Ribeiro, Ana	P2.155
Ribeiro, Jose	P0.25
Ribeiro, José	P0.28
Ribeiro, Jose ´ Carlos	P2.96
Riby, Deborah	P1.41, P1.66
Richards, Elizabeth	<u>P3.99</u> , <u>S8.7.2</u>
Richards, Justin	P1.204, P2.184, <u>P3.125</u> , P3.128, <u>S6.3.3</u> , <u>SO3.1.4</u>
Rich, Michael	P3C.197
Rich, Steven	P1.47
Ridgers, Nicky	P1.135, P3C.213, S5.7.4, S7.3.4
Ridgers, Nicola	P2.112, <u>S2.7.4</u> , S3.5.1, S3.5.2, SO9.4.3
Ridgers, Nicola D	S9.1.4, <u>SO8.4.2</u>
Ridley, Kate	P0.125
Riethmuller, Annaleise	S5.2.4
Rifas-Shiman, Sheryl	O4.2.3
Riley, Nicholas	<u>O1.4.3</u>
Rimkus, Leah	O8.1.3
Riordan, Fiona	S1.6.1
Risica, Patricia	O6.1.2, SO1.4.7
Rissel, Chris	P1.122
Ritchie, Stephen	O7.1.4
Rivard, Marie-Claude	P0.170
Robbins, James	O4.2.5
Roberts, Claire	P3C.201
Roberts, David	S2.3.1
Roberts-Gray, Cindy	SO1.3.8
Roberts Gray, Cindy	P2.58, SO7.4.5, SO7.4.7
Roberts, Joan	SO5.4.7
Robertson, Aileen	S3.1.1, SO9.2.1
Robertson, Ayden	<u>O7.1.4</u> , <u>P3.63</u>
Robertson, Katie	P2.41

AUTHOR INDEX R – S

Name	Presentation Code
Robertson, Samuel	P3.97
Robertson, Wendy	P0.117
Roberts, Rebecca	S7.2.3
Roberts, Sarah	O2.3.4, P2.149
Robets-Gray, Cindy	P1.33
Robinson, Alyssa	O1.2.5, <u>O1.2.6</u>
Robinson, Suzanne	SO2.4.6
Robitaille, Éric	O6.3.5
Robitaille, Julie	P0.84, P1.24, P3.6
Robson, Paula	<u>S2.6.1</u>
Rock, Melanie	S6.1.2, <u>S8.7.3</u>
Rodgers, Wendy	<u>P0.121</u> , P0.189, P1.84
Rodicheva, Natalia	<u>P1.78</u> , P3.142
Rodrigues, Daniela	<u>P0.54</u> , <u>P3C.175</u>
Rodrigues, Roberta	<u>P0.60</u> , P1.63
Rodríguez, Gerardo	O6.2.1
Rogers, Kris	SO6.2.4
Rollo, Megan	O1.1.1, P2.70, S9.7.3
Rolls, Barbara J	SO6.4.1
Romaguera, Dora	<u>S5.3.1</u>
Romanelli, Robert	O1.1.4
Romano, Caterina	S76.2
Romeo-Velilla, Maria	<u>P3C.192</u>
Romo-Palafox, Maria	P2.58, SO7.4.7
Romo-Palafox, Maria Jose	P1.33, SO1.3.8
Romo Palafox, Maria Jose	<u>SO7.4.5</u>
Roncesvalles, Nida	S9.1.1
Röning, Juha	SO4.4.1
Rooksby, John	O2.3.1
Rookus, Matti	P1.230
Rooney, Ciara	P1.65, <u>P3C.241</u>
Rooney, Laura	P0.122
Roos, Eva	P1.31, P2.159, P2.201, <u>P2.205</u> , P2.26, P2.33, P3b.35
Roos, Gun	P1.31, P2.26, <u>P3b.91</u> , S6.7.2
Rosado Marques, Vitor	P0.139
Rosander, Pia	P1.8
Rosander, Ulla	<u>P1.8</u>
Rosario, Derek	S9.3.3
Rose, Belinda	P2.41
Rosella, Laura	P1.64
Rosenbaum, Simon	<u>P2.182</u> , P3.124, P3.125, P3b.33, SO9.2.4
Rosenkranz, Richard	P1.214, P1.78, P3.123
Rosenkranz, Richard R	P2.164, P3.142
Rosenkranz, Sara	P1.78
Rosenkranz, Sara K	P3.142
Roseno, Ashley	P1.28
Rossen, Jenny	<u>P3.130</u>
Ross, Kaile	P2.146
ROSTILA, MIKAEL	P3C.178
Rothman, Alexander	P0.126, P0.182
Roure, Cedric	<u>P1.126</u>
Rouse, Michael	P1.92
Rouse, Peter C	P1.210, P2.135
Rousham, Emily	P3C.189
Routen, Ash	P1.116, <u>P1.199</u> , P2.22, <u>P3C.220</u>
Rowa-Dewar, Neneh	SO6.4.1
Rowe, David	O6.2.4, P2.177, <u>S2.3.4</u>
Rowe, David A	P2.168
Rowlands, Alex	O7.1.5, P1.207
Roy, Maryline	P0.45
Roy, Rajshri	P1.15, <u>P2.2</u> , <u>SO4.1.3</u>
Roze, Mathilde	P3.15, P3b.83
Rubin, Lukas	P0.130, <u>P0.146</u> , P0.48
Rudd, James	<u>P3b.149</u>
Rugseth, Gro	S6.7.2
Ruissen, GERALYN	P1.111

Name	Presentation Code
Rumbold, Penny	P3.75
Rumpunen, Kimmo	P1.8
Rundle, Rachel	P0.134
Rundle-Thiele, Sharyn	P1.54
Rutherford, Zoe	<u>SO3.4.8</u>
Rutten, Geert	P1.99
Ruzic, Lana	P3C.214
Ryde, Gemma	P0.81, <u>P2.148</u> , P3b.156
Ryder, Debbie	<u>P3.103</u>
Sabia, Séverine	P3C.182
Sabiston, Catherine	O3.2.5
Sacheck, Jennifer M	O1.2.1
Sadiya, Amena	P1.21
Saeed, Hibbah Araba	S6.7.1, S6.7.3
Safavi, Seied Morteza	P1.16
Sagedal, Linda R	P3.117, SO6.1.3
Sahasranaman, Aarti	<u>P0.105</u>
Sahlqvist, Shannon	<u>O7.3.3</u>
Sahota, Pinki	P2.77, P3.42
Saidj, Madina	<u>P2.198</u> , <u>P3b.150</u>
Saïd-Mohamed, Rihlat	P0.99
Saimon, Rosalia	<u>P1.106</u>
Sainsbury, Amanda	O1.3.3, O8.3.4
Saint-Maurice, Pedro	<u>P1.174</u> , <u>SO8.4.4</u>
Saldana, Mayra Vanessa	O4.2.1
SALDANHA-GOMES, Cécilia	<u>SO9.4.8</u>
Salkeld, Judith	P0.68
Sallinen, Mikael	P3C.202
Sallis, James	S1.1.1, S1.1.2, <u>S1.1.3</u> , S1.1.4, SO2.4.1
Sallis, James F	P2.166, S8.5.2
Salmon, Jo	O3.1.3, O4.1.5, P0.76, P2.112, P2.183, P2.213, P3.114, P3C.213, P3C.220, <u>S1.4.1</u> , S1.4.2, S2.7.4, S3.5.1, S3.5.2, S5.7.4, S6.1.4, S7.3.4, S9.1.4, S9.5.3, SO8.4.2, SO9.4.3, SO9.4.4
Salonna, Ferdinand	<u>P0.148</u> , P3.115
Salvo, Deborah	S1.1.2, S1.1.3, S3.2.2
Samaras, Katherine	P3b.33, SO9.2.4
Samdal, Oddrun	P2.85
Sameoto, Colleen	<u>P2.40</u>
Sampson, Margaret	P1.195
Samrout, Mariam	P2.2
Sanchez, Marina	P0.190
Sandercock, Gavin	P1.175
Sanders, Taren	O5.1.1, <u>P3C.217</u>
Sands, Faith	P0.68
Santarossa, Sara	<u>P2.225</u>
Santorelli, Gillian	P1.212, P2.77
Santos, Amanda	<u>P3C.193</u> , P3C.194
Santos, Inês	<u>P0.176</u>
Santos, Magda	P0.44
Santos, Maria	P0.25
Santos, Maria Paula	P2.96, <u>SO5.4.5</u>
Santos, Paula	P2.155
Santos, Rute	P0.133
São-João, Thaís	P0.60
Sargent, Judith	P2.77
Sari, Nazmi	P2.163
Sarjala, Satu-Maaria	P3.127
Sarmiento, Olga	O6.1.1, S1.1.1, <u>S3.7.2</u>
Sarrazin, Philippe	SO1.1.2
Sartini, Claudio	SO6.2.3
Sasaki, Jeffer Eidi	P0.150
Saulnier, Matthew	P1.13
Saunders, April	P0.94
Saunders, Chelsey	P2.128
Saunders, Travis	O1.3.4

AUTHOR INDEX S

Name	Presentation Code
Saurel-Cubizolles, Marie-Josèphe	P2.15
Sauter, Charlotte	P3C.229
Savage, Jennifer	<u>P3b.88</u>
Savage, Jennifer S	SO6.4.1
Savelberg, Hans	P0.115, P1.95, SO2.2.4
Sawka, Keri Jo	P1.14
Saxton, John	<u>S9.3.3</u>
Scarborough, Peter	P0.72, S5.6.1, S5.6.3, S5.6.4, SO3.4.1
Schäfer Elinder, Liselotte	O6.3.1, P2.63, <u>S8.6.2</u>
Schaller, Andrea	P0.180
Schaper, Nicolaas	P0.115, P1.95
Scharf, Carina	P2.142
Scheel, Frederik	P2.185
Scheerder, Jeroen	SO6.2.1
Scheers, Tineke	SO4.4.6
Schenkelberg, Michaela	<u>P1.115</u>
Schep, Goof	S9.3.2
Schermel, Alyssa	<u>P2.234</u> , P3.21
Schiff, Annie	P1.134
Schipperijn, Jasper	P0.101, P0.41, P2.131, P2.171, P2.82, P3C.235, S2.5.4, S6.1.1, <u>S7.2.1</u> , S7.7.1, S7.7.4, SO2.4.1, SO5.4.5
Schlechter, Haley A	SO6.4.1
Schlicht, Wolfgang	SO8.4.6
Schmidt, Michael	O6.2.4
Schmitz, Charlotte	P2.207
SCHMOELZ, CAMILIE	<u>P0.184</u>
Schneider, Drew	S3.5.3
Schneider, Nora	P2.47
Schober, Daniel	P1.88, <u>S6.5.3</u>
Schoenberg, Nancy	P2.31
Schoeppe, Stephanie	P1.189, <u>SO5.4.1</u>
Schofield, Grant	P2.203
Schotte, Astrid	SO4.4.6
Schrader, Amy	O4.2.5
Schroeder, Yvonne	P3C.221, P3C.246
Schulin, Rebecca	SO1.3.7
Schwartz, Daniëlle CM	O3.3.2
Scott, Jane	P0.31
Scozzafava, Gabriele	S7.6.2
Sebire, Simon	<u>O3.1.4</u> , O3.2.6, P1.12, P2.116
Seenithamby, Manoharan	P2.7
Seghers, Jan	O2.3.5, O3.2.1, P2.89, <u>SO4.4.6</u>
Segura-Jiménez, Víctor	P0.108
Seidell, Jaap	P1.230, P3.77
Seika, Philippa	P3C.229
Seiler, Hilde L	SO6.1.3
Seimelä, Timo	P3.127
Seimon, Radhika	O8.3.4
Selzler, Anne-Marie	P0.121, <u>P0.189</u>
Semanik, Pamela	O4.1.3
Senaviratne, Chamil	P3b.24
Sepp, Hanna	P1.8
Serrano, Elena	<u>S4.1.1</u>
Serrano, Katrina	O2.2.3
Shahshahan, Zahra	P1.16
Shanafelt, MA, Amy	<u>SO1.4.3</u>
Shanafelt, Amy	P1.19, <u>P2.4</u>
Shannon, Stephen	<u>P2.191</u>
Sharpe, Patricia	<u>P3C.181</u> , S3.3.2
Sharp, Paul	P3.70
Sharp, Teresa	P2.92
Shaw, Alison	P1.143, P2.139
Shaw, Anneliese	<u>P1.20</u>
Sheats, Jylana	S3.2.2
Sheche, Judith	P3.78
Sheeran, Paschal	P0.97

Name	Presentation Code
Sheeshka, Judy	SO7.4.3
Shefer, Guy	SO3.1.1
Shelnutt, Karla	P2.57
Shelton, Nicola	O1.4.1
Shepherd, Ashley	P2.148
Sheppard, Brett	P3.1
Sherar, Lauren	P1.136, P3C.220, <u>S5.7.3</u>
Sherrington, Catherine	P1.122
Shibanuma, Akira	P0.7
Shibata, Ai	P3C.183
Shields, Chris	S7.3.2
Shiell, Alan	SO1.4.6
Shipley, Cara	S7.1.1
Shire, Katy	SO5.2.1
Shitole, Sanyog	SO3.4.2
Shoham, David	S5.5.3
Short, Asha	S4.3.4
Short, Camille	P1.189, S2.2.1, <u>S9.3.1</u>
Shortt, Niamh	P0.55
Shridhar, Krithiga	P3b.161
Shub, Alexis	P2.222
Shuell, Julie	P1.88, S6.5.3
Shukla, DK	P1.140
Sia Perin, Milena	P0.5
Sidhu, Manbinder	P1.222
Siegrist, Michael	O5.2.3, <u>P1.1</u> , P2.228, P3.60, S7.6.3, SO5.1.3, SO7.2.2
Sieling, Jared	P1.42
Siggers, Andrea	P3C.201
Sigmund, Erik	P1.162, <u>P1.197</u>
Sigmundova, Dagmar	P3.115
Sigmundová, Dagmar	P1.162, P1.197
Signal, Louise	<u>O2.2.5</u> , O8.1.1, P1.25, P1.26, <u>P1.35</u>
Silva, Alexandre	P1.181
Silva dos Santos, Sandra	P3C.193, <u>P3C.194</u>
Silva, Gustavo	P0.25
Silva, Jeruza	<u>P1.181</u>
SILVA, KELLY	P0.184
Silva, Marlene	P0.40
Silva, Marlene N	P0.165, P0.47
Simi, Helmut	P0.113
Similä, Heidi	P3C.215
Sim, Kyra	P2.32
Simmonds, Jane	P2.179
Simon, Chantal	P2.198, S1.3.3
Simons, Dorien	<u>S8.5.1</u> , S8.5.3
Simons-Morton, Bruce	O4.1.1, O5.2.1
Simpson, Sharon	<u>S4.3.1</u>
Simpson, Sharon A	P2.226
Sims-Gould, Joanie	O5.3.4, P1.149, P1.177, P2.125
Sims, Jamie	<u>SO3.4.1</u>
Simunek, Adam	P0.59
Sindberg, Gregory M	<u>P0.120</u>
Singh, Amika	O5.3.2, P2.114, SO8.4.1
Singh-Manoux, Archana	P3C.182
Sioen, Isabelle	S4.7.4, S8.2.1
Sisson, Susan	P0.177
Sitch, Matthew	P0.185, <u>P3C.222</u> , P3C.233
Skau Pawlowski, Charlotte	S7.7.4
Skeaff, Sheila	<u>P1.51</u>
Skelton, Dawn	P0.24, S2.7.3
Skelton, Dawn A	P3C.208
Skelton, Kara	P2.65
Skidmore, Paula	<u>P1.23</u>
Skinner, Geoff	P3b.85
Skovgaard, Thomas	P0.34
Skreden, Marianne	<u>P3.117</u> , SO6.1.3

AUTHOR INDEX S

Name	Presentation Code
Skrzypiec, Grace	SO8.4.1
Slater, Linda	P0.162
Sleddens, Ester	P0.142, P2.205, P2.33, S4.7.4
Slee, Phillip	SO8.4.1
Slevin, Terry	SO3.2.1
Slimani, Nadia	S1.6.1, <u>S2.6.2</u>
Sloan, Robert	P0.105
Small, Neil	P2.77
Smeaton, Alan	P3.4
Smed, Sinne	<u>P2.231</u>
Smith, Alice	P3.107, P3.108
Smith, Carolyn	P1.103
Smith, Debbie	P0.82
Smith, Graeme	<u>P1.124</u>
Smith, Graham	SO2.4.1
Smith, Jaime	S6.2.2
Smith, Jessica	P3.17
Smith, Jordan	<u>P1.109</u> , S6.3.2
Smith, Katie	P0.32, SO6.1.2
Smith, Kevin	SO9.4.6
Smith, Kylie	<u>O6.2.5</u> , P1.49, P3.69
Smith, Lee	O5.3.1, <u>P1.110</u> , P1.190, <u>P1.192</u> , P2.195
Smith, Lindsey	<u>S4.5.1</u>
Smith, Moira	O8.1.1, <u>P1.25</u> , <u>P1.26</u> , P1.35
Smith, Nathan	SO1.1.2
Smith, Otto Robert Frans	P2.85
Smith, Sarah	P0.85, <u>P2.221</u>
Smith, Stephanie	P2.52, SO64.5
Smith, Teresa	P2.30, P2.56, SO4.1.4
Smyth, Peter	P2.140, P2.191
Sniehotta, Falco F	P3C.223
Sniehotta, Falko	P0.169, P0.176, P3C.242
Sniehotta, Falko F	P1.53
Soares, Jesus	O1.3.1
Socha, Piotr	P2.34, S5.1.2
Sodov, Sonin	P0.158
Solstad, Bård Erlend	<u>P2.86</u>
Soltero, Erica	P2.87
Somers, Julia	<u>S4.2.3</u>
Som, Nivedita	<u>P0.18</u>
Song, Jieyun	P0.127
Song, Yena	O7.3.3
Sopper, Maggie	P3.64
Sorenson, Carl	P1.115
Soria Contreras, Diana	P1.61
Soriano-Maldonado, Aberto	P0.108
Sothorn, Melinda	<u>P3C.243</u>
Spees, Colleen	P1.13
Spence, Alison	SO7.4.1
Spence, John	P0.162, <u>P1.193</u> , P1.84, SO3.4.5
Spence, John C	<u>P0.83</u> , S9.2.3
Spence, Michelle	P0.73, P3C.211
Spencer-Cavalier, Nancy	SO3.1.2
Spengler, Sarah	P0.128, P0.129, <u>P0.172</u>
Spigt, Mark	SO1.3.1
Spook, Jorinde	<u>P2.122</u>
Spratt O Shea, Niamh	<u>P3b.164</u>
Spring, Bonnie J	P1.229
Sprod, Judy	<u>P2.181</u> , <u>SO8.2.4</u>
Spruijt-Metz, Donna	O4.2.6
Srinivasan, Sumeeta	P1.129
srivastava, Ratan	P0.6
Stabile Morrell, Jesse	P1.72
Stacey, Fiona	P0.174, P2.71
Stalker, Kirsten	S8.6.1
Stamatakis, Emmanuel	O1.4.1, O4.1.2, P2.202, SO8.2.1, SO8.2.3

Name	Presentation Code
Stancu, Violeta	<u>S76.2</u>
Standage, Martyn	O3.2.6, O6.1.1, P0.87
Stang, Jamie	S4.2.4
Stanley, Rebecca	<u>P1.208</u> , S5.2.4
Staveborg Kerkelä, Ellen	P1.133
Stead, Martine	P2.16, P3b.82
Stea, Tonje H	P1.30
Steed, Liz	S9.3.3
Steele, Robert	P0.122, P3b.82
Steeves, Jeremy	<u>P3C.172</u>
Steinacker, Jürgen M	P0.90
Steinmetz-Wood, Madeleine	<u>P0.64</u> , <u>P1.129</u>
Ste-Marie, Nathalie	P1.177
Stephen, Judy	P0.21
Stevens, Gonneke	O6.3.2
Stevinson, Clare	P0.42
Stewart, Jessica	P2.146
Stewart, Sally	P0.138
Stickland, Michael	P0.121, P0.189
Stierlin, Annabel	S1.3.1
St-Jules, David	P1.47
Stluka, Suzanne	P3.76
Stocken, Deborah	P2.16
Stockley, Lynn	SO9.2.1
Stodden, David	P1.109, S9.1.1
Stok, Marijn	<u>S8.1.4</u> , <u>SO1.3.2</u>
Stolp, Sean	P3.70
Stone, Matthew	P3b.159
Stone, Michelle	P1.150, P3.118, S6.3.1
Stopforth, Marie	<u>P3C.201</u>
Storcksdieck genannt Bonsmann, Stefan	P3b.25
Storey, Kate	SO6.4.2
Storgaard, Stine	P0.110
Story, Mary	P1.88
STRAATMANN, VIVIANE	<u>P3C.178</u>
Strachan, Shaelyn	<u>O3.2.3</u>
Stragier, Jeroen	<u>P2.106</u> , <u>P2.108</u>
Straker, Leon	P0.81, P3b.156
Strand, Jennifer	P1.133
Stratil, Jan	P3C.229
Stratil, Jan M	<u>P0.140</u>
Stratton, Gareth	P1.135
Strauss, Sharon	P3C.231
Strawderman, Myla	P3b.84
Strawderman, Myla S	S4.3.2
Stringer, Danielle	<u>P1.74</u>
Stronks, Karien	P0.163, S6.7.1, S6.7.3
Strydom, Gert L	P0.159
Stuart, Biddle	P3b.163
Stucker, Jessica	P3C.181
Subhashini, S	P1.140
Suchomel, Ales	P1.179
Sudeck, Gorden	P0.128
Sudholz, Bronwyn	<u>P0.76</u> , <u>P3C.213</u> , S3.5.2
Sugiyama, Takemi	S11.4, SO1.4.6, SO4.2.2
Suhrcke, Marc	S7.3.1
Sui, Zhixian	S4.3.4
Sukala, William	O1.3.3
Sumar, Nureen	S8.3.2
Summerbell, Carolyn	O2.2.1, P0.169, P0.85, P1.116, P1.199, P2.21, P2.22, P2.221, P2.84, P3b.28
Summers-Lubar, Tansey	P3C.209
Sundblom, Elinor	S8.6.2
Sun, Guibo	<u>P3.100</u>
Sun, Mingui	P1.5

AUTHOR INDEX S – T

Name	Presentation Code
Surenthirakumaran, Rajendra	P3.128
Sutherland, Rachel	O6.1.3, P1.152, P1.153, P2.42, P3b.158
Sutton, Christopher	P0.42
Sutton, Eileen	P0.86
Sutton, Stephen	P0.109, P1.77
Svastisalee, Chalida	P0.41
Svoboda, Zdeněk	P0.191
Swanson, Kenda	P1.14, S6.1.2, S8.7.3
Swanson, Mark	P2.31
Sweet, Shane	P2.128
Sweitzer, Sara	P1.33, P2.58, SO1.3.8, SO7.4.7
Sweitzer, Sara J	SO7.4.5
Swinburn, Boyd	S9.2.1, SO1.4.8
Swyden, Katheryn	P0.177
Sylvester, Benjamin	P1.111
Taber, Daniel	O8.1.3
Tahna, Tina	P2.93
Tai, E Shyong	P2.230
Tainio, Marko	P2.153, SO9.4.1
Taki, Sarah	P1.29
Talluri, Eleonora	P2.189
Tami, Suzan	P2.69
Tan, Chuen Seng	P2.209
Tandon, Pooja	P2.88
Tang, Jianjun	O1.3.5
Tang, Mei Yee	P0.82
Tanskey, Lindsay	P1.69, P1.70
Tanton, Jina	P1.98
Tarasuk, Val	S8.3.2
Tarlov, Elizabeth	S3.3.4
Tarvainen, Mika	S6.1.3
Tataranni, Antonio	P1.145
Tate, Deborah F	O8.3.2
Taylor, Adrian	P2.157
Taylor, Ashlee	P3.68
Taylor, Chris	P1.13
Taylor, Ian	P1.136
Taylor, Rod	P2.157
Taylor, Stephanie	SO1.4.5
Taymoori, Parvaneh	P1.113
Tay, Wei Rong	P2.209
Tchernof, André	P2.233
Teasdale, Scott	P3b.33 , SO9.2.4
Teh, Long Hua	P2.209
Teixeira, Diogo	P3b.162
Teixeira, Diogo S	P0.47
Teixeira, Pedro	P0.176, P0.40
Teixeira, Pedro J	P0.13, P0.165
Tembo, Rodney	P1.92
Ten Dam, Joop	O3.3.2
Terragni, Laura	P1.36, S6.7.1, S6.7.2, S6.7.3
Terrón-Pérez, Marta	P0.75
Tesdahl, Eric	S5.5.3
Tessier, Damien	SO1.1.2
Tessier-Grenier, Maude	P1.24
Teuscher, Dorit	P1.89
te Velde, Saskia	O6.1.4
te Velde, Saskia J	P2.124
Teychenne, Megan	P3.7, P3b.148
Tfayli, Arafat	P0.1
Thai, Chan	O2.2.3
Thanasoulas, Andreas	P1.12
Tharner, Anne	P2.19, P2.48, SO6.4.7
Therrien, Suzanne	O5.3.4, P1.149
the SPOTLIGHT consortium, on behalf of	S1.7.1, S1.7.2, S1.7.3, S1.7.4

Name	Presentation Code
Theunynck, Denis	P3.120
Thiel, Ansgar	P0.128
Thijs, Carel	S4.7.4
Thind, Herpreet	SO1.4.1
Thivel, David	SO6.4.1
Thøgersen-Ntoumani, Cecilie	P0.46
Thomas, Astell-Burt	P1.122
Thomas, Emma	P0.167
Thomas, James	P3.41
Thomas, Laura	P0.148, P0.151
Thompson, Claire	P3.75, SO1.4.5
Thompson, Debbe	P0.30, S2.4.3
Thompson, Deborah	P2.70, P3.135
Thompson, Dixie Lee	P3C.172
Thompson, Janice	O3.1.4
Thompson, Mary	O8.1.4
Thomson, Hilary	S3.2.1
Thomson, Jennifer	P0.55
Thomson, Katie	P1.199
Thomson, Russell	P3.69
Thornton, Lukar	O4.3.2, P1.52 , P3C.239, S3.3.1 , SO1.4.4, SO2.1.1, SO2.1.2
Thorpe, Maree	P1.46
Thørring Bonnesen, Camilla	P0.104 , P3.38
Thorsson, Ola	P2.93
Thul, Chelsey	P3b.152
Thumann, Barbara, F	S1.6.1
Thune-Boyle, Ingela	P2.179
Thunstrom, Linda	P2.231
Tibbits, Byron	O5.3.5
Tibbits, Byron	P2.123
Tiemeier, Henning	P2.19, P2.47, P2.48, SO6.4.7
Tiffin, Richard	S5.6.3
Tiilikainen, Johanna	P3.127
Tilling, Kate	O6.2.1
Tilton, Nicholas	O6.1.5
Timotijevic, Lada	P3C.234
Timperio, Anna	O6.1.4, P0.186 , P3.114, P3C.213, S1.4.1, S2.7.4, S3.5.2, S5.7.4 , S6.1.4, S7.3.4, S9.5.3, SO2.4.5, SO8.4.2
Tinati, Tannaze	P3b.34
Titze, Sylvia	P1.123, P2.142 , P3.127
Tjon a Joe, Sheena	P1.230
Tjørnhøj-Thomsen, Tine	P2.82
Tkaczick, Tobias	O1.2.2
Todd, Adam	P0.169, P2.221
Todd, Michael	SO1.2.2
Todd, Micheal	P2.65
Toftager, Mette	P0.104, P1.161, P3.38
Toft, Ulla	O2.2.2 , O6.3.4
Tolstrup, Janne	P0.131
Tomayko, Emily	P3.78, P3b.90
Tomaz, Simone	P1.144 , S5.2.2
Tomita, Katia	P1.42
Tomporowski, Phillip D	SO3.4.4
Tongo, Oni	O8.1.5
Toohy, Ann	S8.7.3
Torres, Susan	P3.7
Torstveit, Monica K	P1.30, SO6.1.3
Torsveit, Monica K	P3.117
Toumpakari, Zoi	O5.2.2
Tovar, Alison	P2.50 , S5.1.3
Tovée, Martin J	P1.53
Townsend, Nicholas	S2.3.1
Townsend, Nick	P1.143, P1.4 , P2.7, P3b.24
ToyBox study group, on behalf of the	S5.2.3

AUTHOR INDEX T – V

Name	Presentation Code
Trapp, Georgina	P3C.239
Trapp, Gina	P3C.184
Tremblay, Angelo	O1.3.4
Tremblay, Mark	O1.3.4 , P0.162 , P1.195 , P2.160 , SO3.4.5 , SO8.2.2
Treuth, Margarita	SO5.2.2
Tribess, Sheilla	P0.150 , P0.152
Trieu, Kathy	S8.3.2 , S8.3.3
Trill, David	S4.1.4
Troelsen, Jens	P1.161
Trofolz, Amanda	S4.2.4
Trost, Stewart	P2.68
Trost, Stewart G	SO5.4.1
Trudeau, François	P0.170 , P0.45 , P3C.216
Trumpeter, Neve	P1.115
Tryon, Samantha	O8.1.5 , P1.96
Tsai, Wan-Chi	P1.196
Tseng, Chie-Chien	P2.120
Tseng, Chi-Fen	P2.154
Tsuji, Leonard	P0.21
Tu, Andrew	P2.111 , P2.113 , P3b.29
Tucker, Faye	P3.59
Tucker, Patricia	P0.98 , P1.203
Tucker, Trish	O3.1.1
Tucunduva Philippi, Sonia	P1.71 , P2.219
Tulle, Emmanuelle	P3C.209
Tully, Mark A	P3C.225
Tumenjargal, Enkhjargal	P0.158
Tuovinen, Lauri	SO4.4.1
Turbide, Ginette	P0.45
Turcotte, Mylène	O8.3.5 , P1.231 , P1.62
Turnbull, Deborah	S4.3.4
Turner, David	S7.3.1
Turner, Katrina	P0.112
Turrell, Gavin	SO1.4.6 , SO4.2.3
Turtumøygard, Ida	P2.185
Twisk, Jos	O5.3.2 , P0.63 , S9.3.2
Tymms, Peter	P1.199
Tyrrell, Rachel	P2.1
Tzioumakis, Yannis	SO1.1.2
Uijtdewilligen, Léonie	O5.3.2 , P2.114
Ukegbu, Patricia	P3.43 , P3.5
Ullah, Shahid	P0.33
Ulmer, Jared	O4.3.3
Updyke, Natalie	P1.78 , P3.142
Uslan, Daniella	P3.1
Utley, Andrea	P1.151
Uwaegbute, Ada	P2.66 , P3.43 , P3.5
Vaismaa, Kalle	P3.127
Valach, Petr	P1.179
Valderrama, Alena	P0.118 , P0.36
Valente, Maria	P2.111 , P2.29 , P3b.29
Valente, Marie	P1.32
Valente, Tom	S5.5.4
Vale, Susana	P3C.193 , P3C.194
Vallance, Jeff	P1.128 , P3.106
Valois, Pierre	P0.26
van 't Veer, Pieter	S1.6.1
Vanaelst, Barbara	P1.73
Van Allen, Jason	P3.68
van Assema, Patricia	P0.115
Vanbeselaere, Norbert	SO6.2.1
Van Camp, John	O5.2.5 , O5.2.6 , S8.2.2 , SO6.4.6
Van Cauwenberg, Jelle	S1.4.2 , S7.7.3 , S8.5.1 , S8.5.3 , S9.5.1 , S9.5.3 , SO2.4.3 , SO2.4.4
van Dam, Rob	P2.230
van Dam, Rob M	P2.209

Name	Presentation Code
van de Goor, Ien	P1.99
Vandelanotte, Corneel	P0.121 , P1.189 , P2.164 , P2.68 , P3.111 , S2.2.3 , S8.5.1 , S8.5.3 , S9.3.1 , SO4.4.8
Vandelanotte, Croneel	S2.2.1
Vanden Abeele, Vero	O2.3.5
van den Berg, Matthijs	P3b.91
Vandentorren, Stéphanie	P3.15 , P3b.83
van der Horst, Klazine	P2.45 , P2.60
Vanderlee, Lana	P0.155
Vanderloo, Leigh	O3.1.1 , P0.98 , P1.203
van der Pligt, Paige	P3b.148
van der Ploeg, Hidde	P2.215 , SO6.2.4 , SO8.2.3 , SO8.4.8
Vander Ploeg, Kerry	P3C.219 , SO9.4.7
Vandevijvere, Stefanie	S9.2.1 , SO1.4.8
Van de Weghe, Nico	S9.5.1
van Dijk, Sandra	P1.89
van Dongen, Ellen	O2.1.3
Van Dyck, Delfien	S1.1.2 , S2.5.1 , S2.5.2 , S7.7.3 , S8.5.3 , S9.5.1 , SO2.4.3 , SO2.4.4
van Ekris, Evi	S6.6.2 , S6.6.3
van Empelen, Pepijn	P2.122
Van Engen, Meagan	P2.78
Vangeel, Jolien	O5.2.5 , O5.2.6 , SO6.4.6
van Halteren, Aart	P2.124
Van Hecke, Linde	SO2.4.4
van Hees, Vincent	O7.1.2 , P1.138 , P2.133 , SO8.4.7
van Hees, Vincent T	P3C.182
Van Holle, Veerle	S7.7.3 , S9.5.1 , SO2.4.3
Van Horn, M Lee	O5.1.5
Van Kann, Dave	P2.171 , S2.5.4
van Leeuwen, Flora	P1.230
van Lenthe, Frank	P2.107
van Lieshout, Robin	P0.115
Van Lippevelde, Wendy	O1.4.5 , O5.2.5 , O5.2.6 , P2.34 , S8.2.2 , SO6.4.6
van Loon, Josh	O8.1.4
van Mechelen, Willem	O5.3.2 , S2.5.3 , S9.3.2 , SO8.4.1
van Nassau, Femke	SO8.4.1 , SO8.4.8
van Rinsum, Celeste	P1.99
Vanroy, Jari	P2.89
van Sluijs, Esther	P0.109 , P1.134 , P2.186 , P2.84 , P3b.28 , S5.7.3 , S7.3.1 , SO1.1.3
Van Sluijs, Esther MF	O1.2.3
van 't Veer, Pieter	O2.1.3
van Uffelen, Jannique	P0.79 , P1.94 , P2.100 , P3.126
Van Winkle, Lauren	O3.3.1
Vanwolleghe, Griet	S2.5.2
Varela-Mato, Veronica	P2.190
Vargese, Shiby	P1.21
Vasankari, Tommi	P3.127 , P3C.223
Vaughn, Amber	P2.50 , P2.62 , S5.1.3 , S6.5.2
Veerman, Lennert	SO1.4.6
Veiga, Oscar L	P1.160
Veiga, Óscar L	P2.166
Veitch, Jenny	P2.213 , P3.114 , S1.4.1 , S6.1.4 , S9.5.3 , SO2.4.4
Velasco, Cruz	P3C.243
Veldhuijzen van Zanten, Jet	P0.46
Veldhuijzen Van Zanten, Jet JCS	P1.210 , P2.135
Vella, Stewart	P1.208
Vena, John	P2.212
Venn, Alison	O6.2.5 , O6.2.6 , P1.49 , P3.69
Venners, Scott	P1.177
Vepsäläinen, Henna	P2.33
Verbeken, Sandra	S8.2.1
Verbestel, Vera	S4.6.2
Verbruggen, F	S8.1.3
Verdonck-de Leeuw, Irma	S9.3.4

AUTHOR INDEX V – W

Name	Presentation Code
Vergeer, Ineke	P0.79 , P1.94
Verhagen, Evert	P2.121 , S2.5.3 , SO2.2.4
Verhoeven, Hannah	S8.5.3
Verloigne, Maite	P1.186 , P3.114
Verloigne, Maité	O1.4.5 , P2.67 , S2.2.4 , S5.2.3
Vermeer, Julianne	SO7.2.1
Vermeesch, Amber	P3C.187
Vermeire, Leen	P1.73
Vermont, Sidonie	P2.2
Verschuren, Olaf	P2.141 , P2.197
Verstraeten, Roosmarijn	S4.1.3
Vervoort, Leentje	S8.2.2
Veugeleres, Paul	P2.40
Veugeliers, Paul	P3C.219 , SO6.4.2 , SO9.4.7
Vézina-Im, Lydi-Anne	P0.84 , P3.6
Vidgen, Helen	S4.2.1
Viechtbauer, Wolfgang	SO1.3.1
Vieira, Leonardo	P0.154
Vik, Frøydis N	P1.7
Villamonte, Romina	P3.56
Villanueva, Karen	O5.1.3 , SO4.2.2
Vine, Michelle	P1.232
Viner, Russell M	P3C.237
Virtuoso Junior, Jair Sindra	P0.150 , P0.152
Visram, Shelina	P1.41 , P1.66
Vijscher, Tommy	P3.77
Vijscher, Tommy LS	O3.3.2
Visser-Meily, Anne	P2.141 , P2.197
Vistad, Ingvild	P3.117 , SO6.1.3
Vita, Philip	SO2.2.2
Vogel, Christina	P3b.34 , SO2.1.4
Volders, Esmee	P0.107
Vollmer, Rachel	S6.2.2
von Haaren, Birte	O2.3.3 , P3C.224
von Philipsborn, Peter	P3C.229
Voortman, Trudy	P2.47
Voráčová, Jaroslava	P1.197
Vorlíček, Michal	P0.130 , P0.146 , P0.48
Voss, Christine	O5.3.4 , P1.149 , P1.175
Vos, Steven	P0.141 , P0.142
Voukelatos, Alexander	P1.122
Wacker, Rahel	P0.140
Wada, Roy	S5.6.2
Wai-Man, Chan	S9.5.2
Walker, Ali	O4.3.1
Wall, Pat	S4.3.3
Walls, Helen	P3C.171
Walsemann, Katrina	P2.158
Walsh, Eleanor	P1.108
Walton, Caren	P1.103
Wanderley, Rildo	P0.194
Wang, MS, Qi	SO1.4.3
Wang, Coady	S3.3.4
Wang, Haijun	P0.127
Wang, Lu	P2.131 , S7.7.1
Wang, May-Choo	P2.59
Wang, Qi	P1.19 , P2.229 , P2.4 , P2.5
Wannamethee, Goya	SO6.2.3
Warburton, Darren	P3C.236
Warburton, Victoria	P3.136 , P3.137
Ward, Dianne	O3.1.5 , P1.88 , P2.50 , P2.62 , P3.53 , S5.1.3 , S6.5.2
Ward, Dianne S	O8.3.2
Wardle, Jane	P1.192
Ward, Philip	P3.124 , SO9.2.4
Ward, Philip B	P2.182 , P3b.33
Ward, Rachel	P2.10 , SO2.1.3

Name	Presentation Code
Ward Thompson, Catharine	P0.55
Ward, Wendy	O4.2.5
Wärnestål, Pontus	P3.116
Warren-Findlow, Jan	O5.2.4 , SO1.3.4
Warren, Fiona	P2.157
Warren, Judith	P1.103 , P1.105
Warren, Judy	O4.2.4
Washington, Simon	SO1.4.6 , SO4.2.3
Wasserkampf, Anna	SO1.2.1
Waterlander, Wilma	P0.72 , S5.6.4
Waters, Clarice	P1.201 , P2.150 , P2.230 , P2.78
Waters, Elizabeth	SO5.4.8
Watkins, Andrew	P3b.33 , SO9.2.4
Watson, Estelle	P0.96
Watts, Allison	P1.32 , P2.111 , P2.29 , P3b.29 , S4.7.3 , SO2.2.3
Watts, Carolyn	O2.2.5
Watts, Paul	P0.111
Webb, Elizabeth	P0.111
Weber, Christiane	P2.198
Weber, Judith	O4.2.5
Webster, Jacqui	S8.3.2 , S8.3.3
Weedn, Ashley	P0.177
Weichman, Aubrey	P1.85
Weiderpass, Elisabete	P3C.196
Weightman, Alison	O1.3.1
Wei, Jung-Nan	P1.34
Weinman, John A	P1.154
Welch, Amy	P0.32
Welde, Boye	P1.165
Welk, Gregory	P1.174 , P2.218 , SO8.4.4
Wells, Sian	SO5.4.3 , SO5.4.4
Weman-Josefsson, Karin	O3.2.6 , P3.116
Wen, You	SO5.1.4
Westgarth, Carri	P3b.166 , S8.7.1
Wethington, Elaine	S7.5.1
Wetter, David	P3.135
Whaley, Shannon	P2.59
Whelan, Jill	P0.19
Whincup, Peter	SO6.2.3
White, Adrienne	P2.57
White, Christine	SO7.4.3
White, Christine M	P0.155
Whitecrow, Darcy	SO8.4.5
Whiteford, Harvey	P1.146 , P2.187
Whitehead, Ross	P2.145
White, Lauren	P3.110
White, Marcus	S7.2.3
White, Martin	O2.2.1 , P2.16 , P2.20 , P2.21 , P2.22 , P3C.242
White, Mary L	P1.28
White, Rhiannon Lee	P2.132
Whiteside, Bethany	P1.164
Whiteside-Mansell, Leanne	O4.2.5
White, Tonya	P2.47
Whittaker, Robyn	O1.1.5 , O1.4.4
Whittaker, Shannon	SO1.4.1 , SO2.4.8
Whitt-Glover, Melicia	SO3.4.2
Whittlesey, Lisa	P1.103
Wickramasinghe, Kremlin	P1.4 , P2.7 , P3b.24
Wickström, Nicholas	P3.116
Wiebe, Sandra	P0.162
Wiggers, John	O6.1.3 , P0.124 , P1.152 , P1.153 , P2.41 , P2.42 , P3b.158 , P3C.188
Wilcox, Sara	P3C.181 , S3.3.2
Wilhelm Stanis, Sonja	S6.1.1
Wilkins, Lizzie	P0.70
Wilkinson, Shelley	P2.222

AUTHOR INDEX W – Z

Name	Presentation Code
Willcox, Jane	<u>P2.222</u>
Williams, Amanda	P1.152, P3b.158
Williams, Christopher	P3C.188
Williams, Garrath	<u>O3.3.5</u>
Williams, Julianne	P1.4, P2.7, <u>P3b.24</u> , S7.7.2
Williams, Lauren	SO6.1.4
Williams, Lynn	P1.124, <u>P1.9</u> , P2.103
Williamson, Stephanie	P0.88
Williams, Rebecca	P3C.176
Willoughby, Taura	O4.3.1
Wills, Wendy	P2.1
Wilmot, Emma	S4.6.3
Wilson, Carlene	S5.5.2
Wilson, Caroline	P0.65
Wilson, Dawn	O5.1.5
Wilson, Kathryn	<u>P1.155</u> , <u>SO5.1.4</u>
Wilson, Marcia	P1.194, SO3.4.6
Wilson, Mathew G	P0.106
Wing, Erin K	<u>P1.159</u>
Winickoff, Jonathan	O1.2.5
Winkler, Lise Lawaetz	O2.2.2, <u>O6.3.4</u>
Winkvist, Anna	P0.71
Winter, Sandra	S3.2.2
Winters, Meghan	O5.3.4, <u>P1.149</u> , P1.177, <u>P2.125</u>
W.J.H. Penninx, Brenda	P2.134, P2.134
Wojcicki, Thomas	O2.3.4
Wold, Bente	<u>P2.85</u>
Wolfenden, Luke	O6.1.3, P2.41, P2.42, P3C.188
Woll, Alexander	O2.3.3, P0.172
Wollgast, Jan	P3b.25
Wollmer, Per	P2.93
Wong, Annette	P1.15, <u>P1.228</u>
Wong, Annette TY	O1.1.3
Wong, Jyh Eiin	<u>P0.67</u>
Wong, Stephen	O1.2.4, O4.1.5, <u>P0.22</u>
Wong, Tiffany	<u>P2.208</u> , <u>SO1.2.4</u>
Woodcock, James	P2.153, SO9.4.1
Woodfield, Lorayne	<u>P0.23</u> , P1.98, P2.156
Woodfield, Lorayne A	P3.129
Wood, Lesley	O3.1.4, P1.12
Woodruff, Sarah	P2.225, <u>P2.36</u> , <u>P2.37</u>
Woods, Catherine	P2.152, P2.191, S1.6.3, <u>S9.2.3</u> , SO1.1.1
Woods, CatherineB	P3.109, SO5.2.3
Woodside, Jayne	P0.20, P1.65, P3C.212, P3C.241
Woodward, Kerry	P3C.201
Wooldridge, Jennalee S	P2.146
Worobey, John	P2.76, P3.65, P3b.86
Worsley, Anthony	S4.2.3, <u>S7.6.1</u>
Wrieden, Wendy	<u>O6.3.3</u> , P2.20, P2.21
Wright, Catherine M	<u>O1.2.1</u> , P1.69, P1.70
Wright, John	P2.77
Wright, Olivia	P2.68
Wu, Jin-Shang	P1.125
Wu, Qiang	P2.10, SO2.1.3
Wu, Qishan	P1.13
Wushe, Sandra	P0.63
Wyke, Sally	P2.170, P3.48, P3C.206
Wyman, Jean F	P0.126, P0.182
Wyse, Rebecca	P3C.188
Xiao, Cai	P0.37
Xie, Yunlong	O4.1.1
Yamamoto, Shuichiro	P0.89
Yang, Tracy	S7.1.1
Yang, Yi-Ching	P1.125
Yannakoulia, Mary	P0.168
Yano, Shohei	P3C.183

Name	Presentation Code
Yanovski, Jack	SO9.4.6
Yao, Pierre-Luc	P0.170
Yaquian, Elisa	P1.92
Yaroach, Amy	O2.2.3, P1.215, P1.216, P2.30, P3b.81, <u>S1.5.1</u> , S6.5.3, SO4.1.4
Yaroach, Amy L	<u>P1.88</u>
Yates, Thomas	P3C.191
Yates, Tom	P0.42, P2.190, S4.6.3
Yeatman, Heather	P2.14, P3.2
Yen, Chia-Feng	P2.154
Yin, Shiyuan	P3.71
Yngve, Agneta	P3.130, P3b.35
Yoong, Sze Lin	<u>P0.124</u> , P2.42, <u>P3C.188</u>
Young, Hannah	P3.107, P3.108
Young, Ian	P0.20, P3C.212
Younginer, Nicholas	S4.7.1
Young, Katherine	<u>P2.5</u> , P3.49
Young, Myles	<u>O3.2.4</u> , P3.57, S6.2.3
Yu, Chen-an	P1.210, P2.135
Yun, Lira	<u>P0.119</u>
Zabaleta, Jovanny	P3C.243
Zacca, Rodrigo	P0.25
Zacharias, John	P3.100
Zahra, Jesmond	O3.1.4, <u>P2.116</u>
Zalesin, Kerstyn	P1.75, P2.236
Zarama, Roberto	S3.7.2
Zaric, Gregory	P1.92
Zeljko, Pedisic	P3b.163
Zenk, Shannon	<u>S3.3.4</u>
Zhang, Dachao	P3.96
Zhang, Hongmei	P3.52
Zhang, Jun	S5.5.3
Zhao, HongWei	S3.5.3
Zhao, Pengjun	O7.3.5
Zhong, Amy	P2.211
Zhou, J	S8.1.3
ZIMMO, LENA	P3.93, <u>P3.98</u>
Zoellner, Jamie	P2.150, P2.64, P2.78
Zolotonosa, Maria	P3C.234
Zubrick, Stephen R	O5.1.4