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Poster Sessions
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BREASTFEEDING

P-001

Community program breastfeeding support: staff and participant views in Bangladesh and New York, USA.

Authors: Amy L Frith, Joan Paddock, Jamie Dollahite

Purpose: Suboptimum breastfeeding is associated with increased risk of infant under- and over-nutrition, morbidity and death, and thus is a focus of public health interventions. Identifying program components that contribute to improved breastfeeding outcomes is essential to program design. We explored similarities and differences in program staff and participants’ views regarding the program components that support breastfeeding in Bangladesh and the USA.

Methods: Breastfeeding program staff and mothers of children, aged <12 mo, in Matlab, Bangladesh, and in four counties in New York State, USA, were recruited for qualitative research inquiry. Data were collected using semi-structured informant interviews, participant observations, and review of training materials. Interviews were recorded and transcribed in the USA, and field notes obtained in Bangladesh. Information was synthesized using a program theory model.

Results: Program participants in both locations emphasized the importance of interpersonal support from staff for building breastfeeding confidence and improving breastfeeding rates. In Bangladesh, participants derived support from programmatic inclusion of key family members. In the US, participants derived support from access to program staff when breastfeeding problems occurred; this support was also important in the absence of a breastfeeding problem. Staff in the USA defined support as breastfeeding knowledge, but not in Bangladesh.

Conclusions: Future breastfeeding promotion efforts should examine and strengthen location-specific program components that contribute to breastfeeding success. Programs should consider what participants’ value as support so that programmatic approaches can be tailored effectively.
Breastfeeding Promotion in an Ethnically Diverse Adolescent Sample

Authors: Ismatara Reena, Connie Ruiz, Amy R Shows, Kimberly A Wallet

**Purpose**: The study’s purpose was to test the effects of a breastfeeding promotion session on breastfeeding beliefs and attitudes of high school students.

**Methods**: Participants completed a self-report questionnaire, either before (control group; n = 105) or after (experimental group; n = 102) a breastfeeding promotion session. The questionnaire dealt with beliefs, attitudes, and previous exposure to breastfeeding. A breastfeeding beliefs and attitudes (BBA) score was calculated for each student. Means were compared using the Student t-test for independent samples. Chi-squared analyses were used to assess relations among nominal variables.

**Results**: Ethnic composition of the sample was 65% (n = 135) African American, 14.5% (n = 30) Caucasian, 13.5% (n = 28) Hispanic, and 7% (n = 14) “other”. Sixty percent (n = 123) of participants were female and 40% (n = 84) were male. Mean BBA score for the experimental group (94.6) was significantly higher (p < 0.01) than that of the control group (83.9). Neither gender nor previous breastfeeding exposure was related to BBA score. Members of the experimental group were significantly more likely to indicate they would like their infant to be breastfed more than six months (p < 0.001).

**Conclusions**: Previous studies on breastfeeding promotion have included few African American adolescent males. The influence of the male partner on infant feeding choice is well documented. Breastfeeding rates among African Americans are the lowest in the nation. The present study indicated that African American adolescents, including males, are responsive to breastfeeding promotional efforts.
Eating competence status may moderate nutrition education needs of low-income males with childcare responsibilities

Authors: Barbara A Lohse, Christine M Least

Purpose: Eating competence (EC), a bio-psychosocial model of eating behavior, was examined in male Supplemental Nutrition Assistance Program participants with childcare responsibilities to identify EC-linked nutrition education needs.

Methods: Data were collected by telephone interview from a geo-stratified sample. Surveys measured EC, food security, weight satisfaction, nutrition interests, technology usage, and preferred education strategies.

Results: Males (n=101; 26% black) were from disparate living arrangements. Mean age was 37.4 ± 13.4 years. Food insecurity was evident; 59% had a high school education or less. Most (92%) made snacks/meals for children. 58% were eating competent (ECt); mean EC score was 31.4 ± 8.2. EC scores were higher with weight satisfaction (P=0.008). Males interested in learning to cook tended toward higher EC scores (P=0.056). Physical activity interest was greatest in the highest EC tertile (P=0.05). Those with whole/2% milk available had higher EC Attitude subscale scores (P=0.025) and tended toward higher EC (P=0.08). Fewer ECt than non-ECt males denoted not enough money to buy food as a healthful eating barrier (P=0.006). Number of healthful eating barriers was lower in ECt males (P=0.04). Males using Facebook often (compared to never) had higher EC scores (P=0.042). Among those with more than a high school education, print materials were preferred by more ECt (than non-ECt) males (P=0.005), but preference was not related to EC status for those with less education.

Conclusions: Consideration of EC as a moderator of nutrition behavior and influence on nutrition education planning appears prudent. Funded by USDA; PSU Social Science Research Institute.
Needs assessment reveals interest in nutrition education by the low-income males with childcare responsibilities

Authors: Christine M Least, Barbara A Lohse

**Purpose:** A needs assessment informed nutrition education programming for low-income male Pennsylvania Supplemental Nutrition Assistance Program (SNAP) participants.

**Methods:** Professional telephone interviewers surveyed male SNAP participants 18 to 59 years with childcare responsibilities about health status, eating behaviors, weight satisfaction, eating competence, food security, technology access, and nutrition interests. The statewide sample (n=101; mean age 37.4 ± 13.4 years) was diverse in employment status (27% employed fulltime, 23% unemployed), race (55% white, 26% black) educational level (59% high school or less), and household structure. Most had significant primary caregiver responsibilities (74%); 92% reported child meal/snack preparation.

**Results:** Popular nutrition topics included foods for children (89%), healthful eating (85%), food safety (76%), and easy recipes (74%). 76% identified barriers to eating healthful foods; cited most frequently were taste preference, time, and money. Preferred nutrition education methods were print materials (67%), online information (56%) and one-on-one educator time (49%). Nutrition topics of interest were associated with race (non-whites were more interested in managing money, p=0.036), education level (less educated were more interested in easy recipes, p<0.001), and weight satisfaction (weight dissatisfied were more interested in weight loss, p=0.024). Barriers to healthful eating were not associated with education, race, worry about money for food, or weight satisfaction. Preferred education methods remained unchanged when race and urban/rural status were controlled.

**Conclusions:** Low-income men were not homogeneous in preferred nutrition education topics, methods, or needs. Specific audience assessments will benefit nutrition education for low-income males. Funded by USDA; PSU Social Science Research Institute.
P-005

Does teacher training increase preschool physical activity levels?

Authors: Jean Harvey-Berino, Margaret Dunn-Carver, Brian Flynn

**Purpose**: Preschool students are highly sedentary and little is known about how to increase activity in childcare environments. The purpose of this project was to evaluate the efficacy of teacher training as a way to improve the delivery of structured, teacher-led activity.

**Methods**: Activity level of 4-5 year old children in 4 childcare centers was assessed before and 6 weeks after a one-day teacher training. Teachers were trained in the CATCH Early Childhood (CEC) program and were given all necessary equipment to lead activities at their centers. Children wore SenseWear®Pro 3 accelerometers for 5 hours over two mornings. Accelerometer data in METs was linked with observer coded individual child activity at one-minute intervals. Data were evaluated using single-group repeated measures analysis of variance.

**Results**: After six weeks of implementing the CEC program, average MET levels in preschoolers in three of the four centers increased by 11.5%. The average MET level per minute at baseline was 2.69±0.40 and at follow-up was 2.98±0.52 (p value= .0001). Teachers from all four centers reported spending 24.59 ±12.99 minutes per CEC session with up to two sessions completed per day. Additionally, sedentary time decreased by an average of 26 minutes. Teachers reported following the curriculum closely (3.15 where 1= not at all and 4=completely) and indicated that the children were generally enthusiastic (3.94 where 1=not enthusiastic and 5=very enthusiastic).

**Conclusions**: These results suggest that training teachers to implement structured, teacher-led activities can increase active play and decrease sedentary time in preschool children attending childcare centers.
Reported self-efficacy and observed nutrition and physical activity behaviors of caregivers at childcare centers in North Carolina

Authors: Temitope Erinosho, Stephanie Mazzucca, Phillip Hanson, Derek Hales, Dianne S Ward

Purpose: This study assessed caregivers’ self-efficacy to promote healthy nutrition and physical activity (PA) behaviors in children attending 50 North Carolina childcare centers and their actual behaviors during interactions with children.

Methods: Caregivers’ (n=118) completed a staff survey. Self-efficacy for promoting healthy behaviors was assessed on a 6-point Likert-type scale. Four-day observations were conducted to assess caregivers’ (n=148) actual behaviors in classrooms.

Results: Although 95% of caregivers had received some training in nutrition and PA for young children, 43%, and 34%, respectively, reported the nutrition and PA trainings were not within the previous 12-months. Most (~70%) caregivers were “very confident” they could promote healthy nutrition and PA behaviors in children. Of concern, is that about one-third felt only “slightly confident” that they could get children to try new foods, eat healthy foods daily, and try healthy foods when children appeared uninterested. About 20% also felt “slightly confident” that they could role-model healthy eating, teach the importance of PA, get children to be physically active, and encourage children to be physically active when they appeared uninterested. At ~70% of centers, caregivers were observed modeling healthy nutrition behaviors (sat with, ate same foods, ate fruits and vegetables, told children fruits and vegetables taste good). At ~80% of centers, caregivers participated in outdoor active play and prompted children to increase PA. At 60% of centers, caregivers made positive statements to children about PA.

Conclusions: Providing regular nutrition and PA trainings may enhance caregivers’ self-efficacy and support their promotion of healthy behaviors to young children in their care.
COMIC INFLUENCE ON NUTRITION

P-007

Evaluating the impact of a Manga comic promoting fruit intake on psycho-social variables related to fruit intake and transportation (immersion) among urban youth

Authors: Alen Agaronov, Ningqi Hou, Gina Tripicchio, May May Leung

Purpose: Studies have shown that narratives could be effective tools for promoting health behavior change. The purpose of this study was to determine if a narrative Manga comic (Japanese comic art) with messages encouraging fruit consumption changed related psycho-social variables among middle-school youth.

Methods: A three-group, randomized single-session study was conducted. Participants (n=263; mean age of 13.2±1.1 years) comprised of middle-school students from two central North Carolina public schools. Participants were randomly assigned to one of three groups: 1) Attention-Control (newsletter about Ancient Greece), 2) Comparison (newsletter about fruit), or 3) Comic group (Manga comic about fruit). Psycho-social variables related to fruit intake, such as neo-phobia and behavioral intention, were measured at baseline and immediately after reading. Secondary outcomes included transportation (how much participants were immersed in their media) and identification with the main character, measured at post-test. Outcome variables were measured on a 5-point scale. Multivariate ordered logistic regression models were used to analyze the data.

Results: Participants in the Comic group were 1.86 times more likely to report lower fruit neophobia compared to Control group participants (p=0.06). The Comic group reported higher scores across the three aspects of transportation (cognitive, emotional-affective and visual imagery) (p<0.01) and higher identification scores (p<0.01) compared to the Control group.

Conclusions: Study results are promising. Transportation and identification may be mediating mechanisms for the association between narrative health media and their potential health impact. Further research is suggested to evaluate its impact on additional health beliefs and behaviors.
Exploring the Impact of a Manga Comic Promoting Fruit Consumption on Cognitive Processing and Emotional Affect in Middle-School Youth

Authors: Gina Tripicchio, Ningqi Hou, Alen Agaronov, May May Leung

**Purpose:** Identifying the underlying mechanisms of engagement and processing pathways could inform the development of effective and innovative interventions addressing health behavior in youth. The purpose of this study was to explore how students’ cognitive processing and affect are impacted after exposure to a Manga-style comic (Japanese comic art) with messages promoting fruit consumption compared to traditional newsletters.

**Methods:** A three-group, randomized single-session study was conducted. Participants included 263 middle-school youth, 9 to 17 years old. Participants were randomly assigned to one of three groups: 1) Attention-Control (newsletter about Ancient Greece), 2) Comparison (newsletter about fruit), or 3) Comic group (Manga-style comic about fruit). Outcomes related to cognitive processing were evaluated using the Elaboration Likelihood Model (ELM) and emotional affect was measured using the Positive and Negative Affect Schedule (PANAS). Data were collected immediately after reading the assigned media and analyzed using regression analyses.

**Results:** Comic group participants reported higher ELM scores compared to Control group participants ($p<0.001$). Furthermore, Comic group participants reported higher scores across the three individual ELM dimensions, which include motivation, ability and favorable thoughts ($p<0.001$). No significant differences were observed in positive or negative PANAS measures across the groups.

**Conclusions:** The results from this study suggest that Manga comics may activate central processing pathways and thereby may encourage long-term knowledge acquisition in middle-school youth, compared to traditional forms of relaying information, such as a newsletter. This understanding could be useful in creating effective media to promote positive health behavior in middle-school youth.
FITNESS/EXERCISE

P-009

Perceived health status as a moderator of maintenance in leisure-time physical activity

Authors: Steve Amireault, Gaston Godin, Marie-Claude Vohl, Louis Pérusse

Purpose: Between-study observations from a recent meta-analysis suggest that health status can act as a moderator of the relationship between BMI, education as well as beliefs about consequences (i.e., attitude) and physical activity maintenance (PAM). The aim of this study was to verify if perceived health status moderates the BMI-, education- and attitude- PAM relationships.

Methods: Secondary analyses were performed among a sample of 174 volunteers (18 to 55 years; 64.9% female) physically active at least three times per week. At baseline, the theory of planned behaviour variables (i.e., intention, perceived behavioural control, attitude), education level and perceived health status were assessed. BMI was calculated (kg/m2) from measured height and weight. A self-report leisure-time physical activity (LTPA) measure was obtained by mail three months later. Multiple imputation technique was used to handle follow-up missing LTPA data.

Results: Multiple hierarchical regression analyses indicated that perceived health status moderated the attitude-behaviour relationship after controlling for intention, perceived behavioural control and past behaviour. Attitude was positively associated with PAM when perceived health was “excellent” (beta = 0.49, p < 0.0001) whereas it was not when perceived health was “average/good/very good” (beta = 0.00, p = 0.99). Perceived behavioural control (beta = 0.12, p = 0.03), past behaviour (beta = 0.24, p = 0.0003) and the attitude × health status interaction term (beta = 0.38; p = 0.01) explained 25% of the variance in PAM.

Conclusions: Individuals with a lower perceived health status should be given special attention in interventions aimed at maximizing the maintenance of LTPA.
Cardiorespiratory Fitness, Alcohol Consumption and the Incidence of Metabolic Syndrome in Men: The Cooper Center Longitudinal Study

Authors: Kerem Shuval, Carrie Finley, Karen Chartier, Bijal Balasubramanian, Kelley Gabriel, Beth Wright

Purpose: Higher levels of cardiorespiratory fitness (CRF) and light-to-moderate alcohol consumption have been associated with a decreased risk for metabolic syndrome (MetS). However, the joint effects of alcohol intake and CRF on MetS have not been investigated.

Methods: We prospectively examined 10,775 men from the Cooper Clinic (Dallas, Texas) who were enrolled in the Cooper Center Longitudinal Study. Participants were included in the study if they had ≥2 clinic visits between 1979-2010, were free of MetS at baseline and had complete data pertaining to the primary exposure variables (CRF and alcohol), outcome (MetS), and covariates. Cox proportional hazard models were computed to estimate hazard ratios (HR) and 95% confidence intervals (CI) of MetS incidence according to CRF and alcohol intake (in separate models) and jointly in the same model while controlling for the covariates.

Results: Moderate and high levels of CRF significantly reduced the incidence of MetS (HR= 0.84; 95% CI 0.75-0.93; HR=0.54; 95% CI 0.48-0.61; respectively), while controlling for alcohol intake and other covariates. In contrast, light and moderate alcohol intake significantly increased the risk of MetS while adjusting for CRF and other confounders. When examining the joint effects of CRF and alcohol on MetS, high fitness levels were protective against MetS irrespective of alcohol consumption levels. A significant interaction effect between the primary exposure variables was not found.

Conclusions: Though significant independent associations between the main exposure variables and MetS were observed, the protective effect of CRF was not significantly modified by alcohol intake levels.
The acute effects of exercise on tobacco withdrawal symptoms and cigarette cravings during temporary smoking abstinence

Authors: Vaughan Roberts, Ralph Maddison, Nick Gant, Chris Bullen

Purpose: Exercise has been shown to attenuate tobacco withdrawal symptoms (TWS) during temporary smoking abstinence; however, the mechanisms of action are not clearly understood. A number of potential mediators of the exercise-craving relationship have been proposed. This is the first study to investigate the potential mediating effects of adrenaline, noradrenaline, heart rate variability, and food cravings on the exercise-cravings relationship during temporary smoking abstinence, and to compare salivary cortisol with plasma cortisol in this context.

Methods: A randomised cross-over trial design was conducted. Following overnight abstinence, smokers (n=43) were assigned to one of three exercise conditions. Each participant attended three separate sessions and performed either light, moderate or vigorous intensity exercise for 15-minutes on a cycle ergometer. Ratings of cigarette cravings, TWS, affect, and food cravings were collected pre and post exercise. A sub-sample of participants also provided blood and saliva samples to examine plasma cortisol, salivary cortisol, adrenaline, noradrenaline, insulin, and glucose.

Results: A total of 40 participants (25 males, mean age = 38 ± 12 years) completed all sessions. Participants reported having their first cigarette of the day within 30-minutes of waking and smoked at least 10 cigarettes per day (mean [SD] cigarette consumption = 18.6 [6.4] per day). Preliminary findings indicate reductions in cigarette cravings following all conditions, with greater effects for vigorous intensity exercise. Full trial results will be presented.

Conclusions: This research will help elucidate by which mechanisms exercise relieves smoking withdrawal symptoms, which will assist the development of future physical activity based smoking cessation interventions.
FOOD ENVIRONMENT

P-012

Exploring the relationship between household food insecurity, parental self-efficacy and fruit and vegetable parenting practices among parents of 5-8 year old overweight children

Authors: ANGELA HILMERS, Karen W Cullen, Carolyn Moore, Teresia M O’Connor

Purpose: Food insecurity may negatively impact children’s nutritional status by affecting parenting quality. Because parents have a strong influence on their children’s eating and food choices, examining the effects of food insecurity on parenting may provide important insights into obesity prevention efforts. This study explored whether food insecurity was associated with parental self-efficacy and parenting practices related to fruit and vegetable consumption.

Methods: Secondary analysis was performed using baseline data from 31 mothers of 5-8 year old overweight or obese children who had participated in a pilot obesity treatment program. Household food security status, fruit and vegetable parental self-efficacy (modeling/socialization, planning/encouraging and availability/accessibility) and fruit and vegetable parenting practices (structure, responsiveness, non-directive control, and external control) were assessed using validated measures. Student’s t test investigated differences in sub-scales by food security status.

Results: There were no significant differences in fruit and vegetable parenting practices and parental self-efficacy between food-secure and insecure groups. There was a trend towards a decrease in parental self-efficacy for making fruit and vegetables available in the home among food-insecure parents (p=.06).

Conclusions: In this small sample no significant associations were found between food insecurity and fruit and vegetable parenting practices and parental self-efficacy. However, the trend observed in this exploratory analysis supports further hypothesis-driven research with a larger sample size able to detect more subtle differences.
Does binge eating mediate the relationship between the food environment and health?

Authors: Heather J Adamus-Leach, Ygnacio Lopez III, Tracey A. Ledoux, Rebecca E. Lee

**Purpose:** Binge eating (BE) is associated with obesity and induced by external cues. The food environment has also been associated with obesity. This study examined mediating effects of BE on the relationship of the food environment to health outcomes [body fat percent (BF%), body mass index (BMI), and blood pressure (BP)].

**Methods:** African American (AA) and Hispanic or Latina (HL) women (N=345, M Age=45.2±9.4) who participated in Health Is Power (NIH 1R01CA109403) completed The Binge Eating Scale (BES). Technicians measured BF%, resting BP, and BMI, and trained auditors counted fast food restaurants and supermarkets in participant neighborhoods using the ©2010 Goods And Services Instrument (GASI). Mediation analysis was conducted.

**Results:** Women had normal BP (M=127.9/78.7±13.8/9.6mmHg), and were mostly obese (M BMI=34.7±8.5kg/m2, M BF%=42.8±7.1). 26.2% of AA and 36.6% of HL women scored in the clinical range of BE (score =18 on BES). Neighborhoods had more fast food restaurants (M=1.68±2.6) than supermarkets (M=0.29±0.56). BE was associated with BF% (β=.209, p<.001), but not BMI or BP. Measures of the food environment were not associated with BE or health outcomes, and BE was not a mediator of this relationship.

**Conclusions:** Among obese minority women BE was common, and there were more fast food restaurants than supermarkets in their neighborhoods. BE was associated with adiposity; however, the food environment was not associated with BE or health outcomes. The food environment is complex; therefore, aspects of the food environment not measured in this study are probably related to BE and health outcomes.
Test-retest reliability of a questionnaire measuring perceptions of neighborhood food environment

Authors: Xiaoguang Ma, Timothy Barnes, Darcy Freedman, Bethany A Bell, Angela D Liese

**Purpose:** To estimate the test-retest reliability of a questionnaire assessing self-reported perceptions of the food environment.

**Methods:** Participants were primary food shoppers of households sampled in an eight-county region in South Carolina. The telephone survey questionnaire on perceptions of the food environment included five questions previously developed for the MESA study. Additionally, we included questions assessing the presence of different food outlet types in the neighborhood. One-hundred-one participants were included. The survey was repeated approximately one month after the initial administration. Spearman’s correlation coefficients were reported as a measure of reliability.

**Results:** Reliability was good for the availability of fresh fruit and vegetables (0.60), low fat products (0.63), opportunities to purchase fast food (0.65), and the lack of access to food shopping (0.69) in the neighborhood. Reliability was excellent for the perceived presence of a supercenter (0.96) and drug stores or pharmacies (0.83). Reliability was good for the presence of a supermarket (0.77), specialty store (0.65), dollar store (0.71), fast food restaurant (0.79) and sit-down restaurant (0.65). Reliability was fair for the availability of high quality fresh fruit and vegetables (0.55), and the presence of small grocery (0.51) and convenience stores (0.58). Participants living in urban areas demonstrated better reliability on questions on opportunities to purchase fast food, problem of lack of access to food shopping, availability of supercenter, drug store or pharmacy than those living in non-urban areas.

**Conclusions:** The majority of questions on perceptions of the neighborhood food environment appear quite reliable, but more research is needed to explain rural-urban differences.
Inventory of local community food and nutrition programs in South Central, Texas.

Authors: Elizenda Benavidez, Nathalie A Burack, Lesli Biediger-Friedman

Purpose: This study aimed to describe the reach of community food and nutrition programs in the South Central, Texas through an inventory of local community programs. Additionally, the geographical gaps of program service were examined. The study compared primary and secondary data to explore the capacity, availability, and the need of food and nutrition programs. Research questions posed were: 1. What are the existing food and nutrition programs in South Central, Texas? 2. What gaps exist in the availability of food and nutrition programs in the area? 3. How do gaps in food and nutrition program availability and service area compare to gaps in food security?

Methods: The study recruited survey participants through accessing community partner LISTSERVs along with a snowball sampling to compile a list of food and nutrition programs in the area. An online survey was used to collect information regarding the types of services offered, the target population aim of the program, and the area of San Antonio the program serviced. Programs were plotted on a GIS map to provide quantitative data in regards to the gaps in the availability of food and nutrition programs.

Results: Data were categorized into a database reporting the services offered and plotted on a GIS map to determine the gaps in programs available compared to food insecurity in the San Antonio area.

Conclusions: The study demonstrated similarities and differences between programmatic and environmental need of food and nutrition programs that effect food insecurity in the San Antonio area.
Metabolic Impact of Concurrent Food Insecurity and Obesity in Children

Authors: June M Tester, Janet King, Patricia B Crawford, Barbara Laraia

Purpose: Concurrent obesity and food insecurity is an increasingly recognized phenomenon in children. While there is data that suggests that food-insecure adults have more challenges with diabetes management, there is little understanding of metabolic consequences of food insecurity in children. This analysis looks at food insecurity in the context of obese children, who are a population at high risk.

Methods: Setting is a large and socio-economically diverse weight management clinic population of children 2 to 18 at 4 sites. The 18-item Food Security Core Module was added in addition to other intake health behavior questions. Laboratory data were obtained at time of referral.

Results: 131 patients (mean BMI 97th percentile) completed the Core Module between May and December, 2011. Sixteen percent were in food-insecure households (3+ affirmative items). Univariate logistic regression showed that food-insecure children were more likely to have an abnormally elevated Hemoglobin A1c (OR 2.7, p=0.04). This relationship was stable and significant after adjusting for other demographics including income and race/ethnicity. They were also 2.6 times more likely to be insulin resistant (using calculated HOMA-IR), though this did not achieve statistical significance (p=0.16). With the exception of a higher rate of reported intake of sweetened beverages, there were no significant differences in ten reported diet and activity health behaviors.

Conclusions: Obese children experiencing the additional burden of household food insecurity may be at higher risk for metabolic consequences than their peers. It is possible that stress pathways or specific dietary habits are contributors.
State Sales Tax on Snacks and Soda is Positively Associated with Nutrition Law Governing U.S. Schools

Authors: Leigh Greathouse, Jamie F Chriqui, Tanya Agurs-Collins, Frank Perna

Purpose: This research examined the association of State sales tax on snacks and sodas as captured in Bridging the Gap (BTG) with the strength of the State school-related competitive food and beverage laws from the School Nutrition-Environment State Policy Classification System (SNESPCS).

Methods: Ordered logistic regression was used to compare the stringency of competitive food laws (Summary score) from SNESPCS as a function of 6 levels of sales tax (range 0-no sales tax to >7.25%) from 2003 – 2010 to BTG. The summary score was generated to reflect a States’ requirements restricting competitive food (0-3; 0 = no requirement, 3 = strongest requirement) for items sold in vending machines, school stores, school fundraisers, and ala cart items. Analyses were conducted with unadjusted or adjusted models controlling for general sales tax, year and state.

Results: A higher soda tax was associated with an increased odds of having a strong school beverage law in the unadjusted (OR = 1.18(0.07); 95% CI 1.05-1.34; p-value = 0.007) and adjusted models (1.18(0.09); 95% CI 1.01 – 1.39; p-value = 0.039). Additionally, a higher State sales tax on snacks was associated with an increased odds of having a strong school snack law in the unadjusted model (1.39 (0.15); 95% CI 1.13 – 1.72; p-value = 0.002), but this association became insignificant in the adjusted model.

Conclusions: States with high sales tax on soda also have stronger competitive school beverage laws, indicating that the State sales tax environment may be associated with specific nutrition policy in schools.
Development of a store-based intervention to promote healthy eating

Authors: Julie Pickrel, Guadalupe X Ayala, Erika Hernandez, Laura Linnan

Purpose: Given the relationship between the presence of small food stores and obesity, interventions to improve access to healthy foods have the potential to change people’s diets. This study describes the development of a store-based intervention to promote healthy eating.

Methods: Interviews with 9 managers, 10 employees, and 9 customers from stores located in a non-target community, as well as interviews with 19 managers and 173 customers, and 63 store audits in the target communities were conducted between November 2010 and May 2011. The former respondents provided input on intervention ideas, and the latter provided input on shopping practices, communication channels for an intervention, and methods for influencing customer purchases. The store audits were used to identify strategies for improving the physical and social environment to promote purchasing of produce and other healthy products.

Results: The triangulation of information from all sources was used to create an intervention that is now being tested in a group randomized controlled trial; four stores have been recruited to-date. The intervention involves three primary components: training of store personnel to promote sales of produce and other healthy food products; a point-of-purchase (POP) campaign that includes traditional marketing components such as aisle violators and other POP materials; and structural changes to the store to ensure their capacity to sell fresh produce.

Conclusions: Partnering with for-profit companies is a necessary strategy to address the obesity epidemic. This presentation will shed light on how researchers are working with small grocery stores to promote healthy eating.
HOME ENVIRONMENT

P-019

Preliminary Findings from A Home-Based Observation of Child, Parent, & Household Factors Associated with Child Obesity in 2- to 3-year-old Children

Authors: Kelly W Lowry, Aneta Jedraszko, Draycen DeCator, Martin Egan, Karolina Fital, Dara Carroll, John V Lavigne

Purpose: To determine which specific parent, child, and home factors influence child weight in early childhood and how these factors interact.

Methods: Parent-child dyads of 2- to 3-year-old children participated in an extensive home-based assessment. Data collection included the Child Feeding Questionnaire, the Children’s Eating Behavior Questionnaire, selected subscales of the Home Observation Scale, parent and child Food Frequency Questionnaires, and a videotaped and coded mealtime interaction.

Results: 105 diverse families (59% minority) participated in the project representing 40 Chicago Community Areas. Child and parent rates of overweight and obesity were consistent with state averages (child overweight=15%, child obesity 10%, maternal overweight=25%, maternal obesity=39%) and maternal BMI was positively associated with child weight percentile (r = .25, p<.01). Individual regression equations, controlling for maternal weight, were used to determine the impact of child, parent, and household factors and indicated that more restriction (B=9.67, SE=3.52, p<.01), less pressure to eat (B= -7.74, SE=2.52, p<.01), faster child eating/less satiety responsiveness (B= -14.05, SE=5.73, p=.02), and higher access to high-sugar/high-fat foods (B= 6.54, SE=2.96, p=.03) were associated with higher child weight percentile. Combining these factors into a single multivariate regression model with 4 steps (maternal BMI, parent, child, home) accounted for 27% of the variance in child weight percentile at this age.

Conclusions: Five potentially modifiable, parent, child, and household factors had a significant impact on child weight early in development. An intervention to target these factors may have a significant impact on pediatric obesity.
P-020

Parental practices and home environment influences on weight status of preschool children

Authors: Michaela A Schenkelberg, Tanis J Hastmann, Richard R Rosenkranz, Bronwyn S Fees, David A Dzewaltowski

Purpose: To examine differences in parental practices and the home environment for normal weight and obese/overweight preschool children.

Methods: Seventy-one preschool children (2-5 years, mean = 3.68 years) were measured by research assistants on height and weight and parents completed a survey. Children were categorized as normal or overweight/obese according to CDC growth charts. The survey drew on validated measures to assess parental practices, home food (Baranowski et al., 2008), physical activity and media environments (Gattshall et al., 2008; Sirard et al., 2008), and children’s behaviors (physical activity, eating, and screen time. Parental practices for advertising mediation and consumer purchase communication were also examined (Buijzen, 2009). A modified SMART Questionnaire (Robinson et al., 1995) examined time spent watching television and videos, playing video games, and computer use.

Results: Obese/overweight children had fewer fruits available at home (p=0.018) and had greater time spent participating in screen time activities compared to normal weight children (p=0.04). Obese/overweight children’s parents discussed purchase decisions more often with them (concept oriented mediation) than parents of normal weight children. Findings are limited by the cross-sectional nature of the study.

Conclusions: Consistent with past research, availability of healthful food may prevent obesity. Although obese/overweight children did not have more media options, they participated in greater screen time activities than normal weight children. Parental practices for teaching concepts related to consumer decision making may be inappropriate for preschool children because the practice may not effectively set limits. Further research should identify how parental practices may need to change with development to prevent obesity.
The Healthy Home Offerings via the Mealtime Environment (HOME) Plus Trial Protocol: an intervention to reduce childhood obesity

Authors: Jayne A Fulkerson, Martha Y Kubik, Dianne Neumark-Sztainer, Colleen Flattum, Mary Story, Olga Gurvich, Ann Garwick, Bonnie Dudovitz

Purpose: Few childhood obesity prevention studies significantly engage parents and focus on the home environment, particularly mealtime. Our purpose is to describe the protocol for HOME Plus, a randomized controlled trial (RCT) to reduce childhood obesity by actively promoting nutritionally-sound and appropriately-portioned snacks and meals in a family meal setting and by reducing sedentary behavior, particularly screen time among children in the home setting.

Methods: The HOME Plus trial is a two-arm (intervention and control) RCT and will include 160 8-12 year old children and their parents in a staggered cohort design. Guided by Social Cognitive Theory, the 10-month HOME Plus intervention consists of monthly sessions delivered in neighborhood community centers and five reinforcement telephone contacts. Sessions are available for all family members with overarching goals of planning, preparing and participating in healthy meals and snacks with family more often and improving the healthfulness of foods available in the home. Activities are hands-on using interactive learning and goal monitoring. Child and parent in-home data collection occurs at baseline, post-intervention and 9-months post-intervention. Main outcomes include child's body mass index z-scores, daily intakes of healthful foods and beverages using 24-hour recall, and minutes of sedentary behavior (particularly screen time); and family-level meal frequency and healthful home food/beverage availability.

Results: N/A

Conclusions: The proposed study, guided by significant known contributors to obesity and solid pilot data and utilizing an innovative study design, is among the first RCTs to test the effectiveness of a home environmental intervention to reduce excess weight gain in 8-12 year old children.
Development of a Home Food and Activity Assessment for Families with Diversity In the Colorado LEAP Study

Authors: Richard Boles, J. Andrea Jaramillo Duran, Laura Bellows, William Gavin, Susan L. Johnson

Purpose: Assessment of home food and activity environments for families of young children has been limited by instrument development with primarily Caucasian families. Existing tools may benefit from modifications relevant to families of minority backgrounds and low socioeconomic status, high-risk populations for obesity. This study aimed to modify and test a home observation assessment instrument among families with socioeconomic and racial/ethnic diversity.

Methods: New items were taken from the Allowable Foods List from Women, Infants, and Children (WIC) (11 items), the Block Food Frequency Questionnaire (BFFQ; 10 items), Colorado State University FFQ (21 items) and expert opinion (26 items). The instrument was completed by 83 caregivers of preschool-aged children during baseline assessment for a longitudinal study on early childhood growth. Families were diverse across ethnicity (30% Hispanic/Latino), education (29% < high school or less), income (45% < $27,000 annual income), and WIC participation (27%).

Results: Families reporting < high school education reported higher levels of sugar sweetened beverages and less low-fat dairy (p<.05) compared to higher education families. Low income families (<$27K/year) reported significantly fewer physical activity devices (p<.001) compared to higher income families. Minority families reported significantly higher numbers of sedentary devices (p<.05) compared to White families. There were no significant differences among demographic comparisons on available fruits/vegetables, meats, and regular fat dairy.

Conclusions: A modified home food and activity instrument provided insight into home environments with a diverse sample of families. Additional psychometric development will be necessary to further validate its use with diverse families.
Assessing the Nutrition and Physical Activity Home Environment of Families with Young Children

Authors: Alexandra C Burdell, Laura Bellows, Susan L. Johnson, William Gavin, Richard Boles

**Purpose:** The home food and activity environment has been linked with dietary intake, physical activity and sedentary behaviors, making it an important target for research. The purpose of this project is to refine a home assessment tool to capture the food and physical activity environment of families with limited resources to identify factors that may impact child weight status.

**Methods:** A modified self-report questionnaire was completed by caregivers of preschool aged children (n = 83). Items included 131 food and drinks, 16 physical activity devices, and 12 sedentary devices. Researchers, trained to reliability, conducted independent observations on 15 randomly selected homes. Agreement statistics were conducted at the item level to determine reliability. Frequency counts were calculated to identify item availability.

**Results:** Kappa Statistics were high (0.67-1.00) among researchers but varied among the subsample of homes (-0.042-1.00) resulting in 85 of the 161 items meeting criterion validity. Frequency statistics of the items revealed high occurrence of unhealthy snack foods, high fat milk and low frequency of availability of fruits/vegetables and low fat milk. Over 50% of the homes identified having a TV in their child's bedroom. Physical activity devices were commonly observed in the home.

**Conclusions:** These preliminary data suggest that this self-report instrument adequately characterizes the home food and activity environment of low income families. The tool will benefit from further development and validation. Future steps will include analysis of behavioral outcomes including dietary consumption and individual weight status and their relation to the home environment.
MEDIA INFLUENCE

P-024

Association between family meals and TV watching during meals and overweight in school children from South/East and North Europe

Authors: Eva Roos, Carola Ray, Agneta Yngve, Christel Lynch, Asa G Kristjansdottir, Saskia J te Velde, Maria Daniel Vaz de Almeida, Cirila Hlastan Ribic

Purpose: Regular family meals have been identified as a possible determinant of overweight in children. Increased TV viewing has been associated with poorer diet quality. The aim was to study the association of eating family breakfast and dinner and TV watching during meals with overweight in children in North and South/East Europe.

Methods: Cross-sectional self-reported data on eating breakfast and dinner with parents and TV watching during meals was collected from 10-12 year old children in five North European countries, Sweden, Netherlands, Iceland, Germany and Finland, and in two South European countries, Portugal, and Greece and two East European countries, Bulgaria and Slovenia, in an EU-project Pro-Greens (N=6316). BMI data was based on parental reports. Age- and sex-specific cut-off points for overweight recommended by the International Obesity Task Force were used. Multilevel logistic regressions were performed using gender, age and parents' education as confounders.

Results: 21% of the children were overweight, 26% in South/East Europe and 15% in North Europe. Eating family meals and TV watching during meals were associated with overweight only North Europe. In North Europe those with fewer family meals and more frequent TV watching during meals were more likely to be overweight.

Conclusions: Eating family meals and TV-viewing during meals did not show consistent association with overweight in North and South/East Europe. Different food cultures in Northern and Southern/Eastern Europe may explain differences in associations. This study does not strength the evidence for a causal relationship between family meals and overweight among schoolchildren.
Increased risk of exceeding media-entertainment guidelines in preschoolers from low socioeconomic background; The Generation R Study

Authors: Anne Wijtzes, Wilma Jansen, Carlijn Kamphuis, Vincent Jaddoe, Henriëtte Moll, Henning Tiemeier, Johan P. Mackenbach, Hein H Raat

**Purpose:** To assess the association between maternal educational level and television viewing in preschool children. We furthermore examined whether this association, if present, can be explained by known determinants of children’s television viewing.

**Methods:** We examined data of 2462 four years old children from Dutch mothers participating in The Generation R Study, a population-based prospective cohort study in Rotterdam, the Netherlands. Odds ratios of watching ≥ 2 hours of television per day were calculated for children of mothers with low, mid-low, and mid-high educational level (reference group: high educational level), after adjustment for confounders and additional adjustment for mediators that were associated with both maternal educational level and television viewing.

**Results:** After adjustment for confounders, children of mothers with a low, mid-low, and mid-high educational level were more likely to watch television for more than 2 hours per day compared to children of high educated mothers, with children of low educated mother showing the highest risk (OR: 10.99; 95% CI: 6.15,19.63). Further adjustment for mediators (i.e. financial difficulties, maternal BMI, parental TV viewing, and presence of a TV set in the child’s bedroom) led to a nearly 50% reduction in OR for the lowest educational group (OR: 6.47; CI: 3.50,11.97).

**Conclusions:** Maternal educational level is inversely associated with children’s television viewing at preschool age. About half of this association could be explained by known determinants of children’s TV viewing. Further longitudinal research into the pathway from low family socioeconomic position to children’s television viewing is warranted.
Parenting practices related to television viewing in low-income Mexican-American immigrant mothers of preschoolers: A qualitative study

Authors: Darcy Thompson, Sarah Polk, Marilyn Camacho, Charissa Cheah, Jeanne Tschann

Purpose: To explore parenting practices related to television viewing in low-income Mexican-American mothers of preschoolers.

Methods: This was a qualitative study using semi-structured, in-home interviews with 21 Spanish-speaking, Mexican-American, immigrant mothers of preschoolers. Participants were asked about their child’s viewing habits and how they parent around television viewing. Interviews lasted 60-90 minutes. Transcripts were analyzed using grounded theory methods and were coded based on emergent themes.

Results: Participant’s mean age was 28 with half having <6th grade education. The mean focal child age was 3.3 years (range 2-4 years). Mothers commonly reported restriction of content (violent, sexual and socially inappropriate) for direct viewing. No mothers intentionally restricted viewing of advertisements. Restriction in general was commonly relaxed for background viewing. Exact time restrictions or rules were uncommon, with most mothers limiting time based on daily activities or other demands. Eating while viewing was mainly restricted to snack time. For some, this was due to concerns that the child would not eat enough if viewing the television during mealtime. Instructing children on TV content was mainly child driven. Additionally, most mothers responded positively to child requests for advertised foods. Co-viewing was commonly reported as the parent(s) viewing with the child playing nearby, but not directly viewing.

Conclusions: Parenting practices such as lack of set time restrictions, limited restriction of background viewing, and positive responses to advertised food requests may influence a child’s obesity risk. These results will be used to develop a culturally-appropriate measure of television parenting practices for application in this population.
**Fast food advertising in South Australia**

Authors: Emily Brindal, Gillian Hendrie, Nadia Corsini, Danielle Baird, Claire Gardner, Patricia Carter

**Purpose:** The South Australian government’s Social Development Committee inquiry into fast food and obesity highlighted concern regarding television advertising of unhealthy food and drinks to children. We aimed to explore fast food advertising on television in SA and changes in advertising since the commencement of industry self-regulation of advertising to children in August 2009.

**Methods:** Four-day (2 weekend, 2 weekday) datasets for February 2009 and March 2010 were purchased from Commercial Monitors. After coding non-food and food advertisements, food advertisements were classified according to types of product advertised and advertising techniques used (promotional characters, nutrition claims, premium offers). Audience data were also purchased from OzTAM to explore children’s viewing patterns.

**Results:** Food advertisements shown in February 2009 and March 2010 accounted for 17.3 and 18.5% of all advertising respectively. Fast foods were shown in 37 (February 09) and 25% (March 10) of all food advertisements with Hungry Jacks, McDonalds and Subway accounting for the majority of fast food advertisements. The change in proportion of fast food advertisements showing only non-core options has been minimal for both signatory (+2.1) and non-signatories (-1.9%) since August 2009. Marketing techniques were used at low rates regardless of signatory status. All advertisements for non-core fast food options were shown outside of Children’s-rated shows. However, children’s viewing data indicate that many children are watching television outside of child-specific programming.

**Conclusions:** Fast food advertising accounts for a notable proportion of all food advertising. Reducing children’s exposure to non-core food advertising will require understanding of children’s actual viewing times.
Relationship between child-reported and parent-reported availability of fruits and vegetables at home

Authors: Alexandra Evans, Jayna Dave, Rose Jennings

Purpose: Availability of fruits and vegetables (F&V) at home increases consumption of F&V among children living in the home. F&V availability is, therefore, considered an important variable to measure in epidemiological studies and an important target for behavioral interventions. Home observations are the most objective method to assess home F&V availability. However, in large public health and intervention studies, home observations are often not feasible, and researchers need to rely on self-report data. Currently, it is unclear whether it is more valid to use parent-report versus child-reported availability. The purpose of this study was to examine the correlation between parent-reported and child-reported availability of aggregate and individual F&V items. In addition, the relationships among parent-reported and child-reported F&V availability and child’s F&V intake were assessed.

Methods: Data on F&V availability at home and F&V intake, and specific demographic variables were obtained from 227, low-income and ethnically diverse adolescents aged 11-14 and parents dyads using paper and pencil surveys. Pearson correlations were used to examine relationships among the variables.

Results: Results indicate a high correlation between parent-reported and child-reported F&V availability (0.51, P<.001). Individual items were highly correlated as well (P<0.05). In addition, both parent- and child-reported F&V availability were significantly correlated with child’s F&V intake (p<0.001). However, the correlation was stronger using child-reported F&V availability (0.45, p<0.001), compared to parent-reported F&V availability (0.33, p<0.001).

Conclusions: Results demonstrate both parent- and child-reported availability of F&V are equally valid indicators of home F&V availability and either can be used as predictors for child’s F&V intake.
Changes and tracking of dietary intakes of fruit, vegetables and sugar sweetened beverages from 18 months to 7 years in the Norwegian Mother and Child Cohort Study

Authors: Mona M Bjelland, Anne Lise AL Brantsæter, Margaretha M Haugen, Helle M HM Meltzer, Wenche W Nystad, Lene LF Frost Andersen

Purpose: The present study investigates the changes and tracking of intakes of fruit, vegetables and sugar sweetened beverages by gender from 18 months to 7 years of age in Norwegian children.

Methods: Data were available for 9488 children participating at three time points (18 months, 36 months and 7 years) in the nation-wide Norwegian Mother and Child Cohort Study, conducted by the Norwegian Institute of Public Health. Intakes of fruit, vegetables and sugar sweetened beverages were assessed by frequency reported by a parent. Slightly different questions were used at each time point to collect information about intake. Relative position in rank, proportions of children’s stability and tracking coefficients of Cohen’s Kappa (weighted) were used to describe the tracking of dietary intakes.

Results: Gender differences were found at 7 years of age only. Preliminary analyses by gender indicated largest individual changes for the intake of fruit and sugar sweetened beverages; more than 30% of the individuals increased their intake over time. The consumption groups kept their relative position in rank over time, though a tendency of regression towards the mean was generally observed. Fair to moderate tracking coefficients (Cohen’s Kappa (weighted) = 0.22-0.46) for the intake of fruit, vegetables and sugar sweetened beverages were found from 18 months to 36 months, from 18 months to 7 years and from 36 months to 7 years.

Conclusions: Due to the observed tracking pattern, promotion of healthy dietary behaviors at an early age is important to prevent the establishment of unfavorable dietary behaviors later in childhood.
Tracking of dietary behaviors in Norwegian adolescents from the age of 11 to 13 years. The HEalth In Adolescents (HEIA) Cohort study.

Authors: Torunn Holm Totland, Mekdes Kebede Gebremariam, Nanna NL Lien, Mona M Bjelland, May Grydeland, Ingunn Holden I.H.B Bergh, Knut-Inge KIK Klepp, Lene LF Frost Andersen

**Purpose**: This study investigates changes and tracking of fruits, vegetables, snacks and sugar-sweetened squash and soft drinks in Norwegian children at transition into adolescence. The current results add to the limited knowledge of separately tracking patterns for snacks, soft drinks and squash in this age group.

**Methods**: A total of 855 adolescents in the HEIA Cohort study (2007-2009) participated by answering Internet-based questionnaires at three time points. Intakes of fruits, vegetables and snacks were assessed by frequency and intakes of sugar sweetened squash and soft drinks by frequency and amount. Changes in mean intake were investigated using ANOVA repeated measures. Tracking patterns were measured as adolescents’ relative position in rank over time, and Cohen’s Kappa was calculated to assess the agreement of intake between time points.

**Results**: A significant increase in mean soft drink intake was observed in adolescents from 11 to 13 years. Tracking patterns of the dietary behaviors indicated that adolescents’ maintained their relative position in rank over time, when grouped by baseline consumption. Fair to moderate coefficients of Cohen’s Kappa were found.

**Conclusions**: The observed tracking patterns indicate the importance of promoting healthy dietary behaviors at an even earlier age. The results suggest that interventions should focus on consumption of sugar-sweetened soft drinks, in children at transition into adolescence.
Multiple input modes for context appropriate diet reporting

Authors: Jared Sieling, Jon Moon, Leah Whigham, James Roemmich

Purpose: Systematic error (bias) in reporting dietary intake decreases when conducted closer to the eating event. However, concurrent reporting can increase participant burden, leading to missed or incomplete reports, or alter behavior in incompatible environments. Studies found increased compliance with mobile devices, but these applied only one input method for all participants and contexts.

Methods: Multiple technologies for food entry can be configured dynamically to accommodate participants’ context and personal preference. We set out to exploit smartphone features to provide multiple user interactions, data management and verifications in a flexible system.

Results: Six input methods were developed successfully that can be configured by investigators or participants, and used singly or in combination, for dietary intake: typing in of food descriptions, speech-to-text conversion with automated food item extraction, record voice for later playback, capture pre- and post-meal photos, capture food label/nutrition facts/barcode photos, and select from recently consumed food sets. One or multiple food databases can be stored and accessed on the phone or wirelessly. Dietary reports are immediately available by remote access for investigators and can be used for multiple-pass entry (e.g., recall interview supported by earlier inputs).

Conclusions: Using multiple input modes is technically feasible and can reduce reporting time. However, using this “N-of-1” approach may conflict with principles in study design that every episode be measured in the same way to minimize unknown errors. Validation studies are being designed to determine overall benefit in new reporting configurations.
Developing an electronic measure of food, beverage, and activity marketing/promotion in schools

Authors: Lara A Latimer, Keryn E Pasch, Joanne E Delk, Andrew E Springer

Purpose: An inexpensive and fast instrument for collecting food, beverage and activity marketing promotion within a school does not currently exist. Aims for this study were to develop a new measurement tool for an iPod touch.

Methods: Researchers conducted pilot direct observations of food, beverage, and activity marketing/promotion in five middle schools in central Texas. An existing paper/pencil instrument was used to determine what descriptive data should be recorded for each occurrence of marketing/promotion. This data is currently being used to create an electronic version for an iPod touch.

Results: A useful measurement tool should record signage content, if it was professionally produced and location. It should also have the option to take a photograph to directly link to descriptive data. Using data from the pilot study, an electronic version of the data collection tool will be developed; steps taken and the electronic tool will be presented.

Conclusions: A paper/pencil version of a data collection instrument for in-school food/activity promotion, while useful, is time consuming in data collection and entry time and does not allow investigators to review signs for accuracy of coding. Using an iPod touch along with a database application would likely minimize time spent in schools without compromising the data that is collected, reduce measurement error since an objective record of what was encountered is available, and allow for immediate data entry, reducing the time and cost of paper/pencil measures. This electronic measurement tool is easy to develop and is relatively low cost.
Discrepancies in parent and child reports regarding the intake of sweet beverages.

Authors: Vivian VMJ van de Gaar, Wilma W Jansen, Lyne LMG Blanchette, Cornelis C Krul, Hein H Raat

Purpose: The purpose of this study was to determine the level of agreement between reports of children, aged 9 to 13 years old, and their parents about the children’s consumption of sweet beverages.

Methods: Schoolchildren and their parents completed parallel questionnaires regarding the consumption of sweet beverages, potential determinants (based on the EnRG-model) and general demographics. Only matched child-parent couples were included in the analyses (n = 272 pairs). To assess the level of agreement between child and parent reports, paired t-tests and correlation analyses were used.

Results: Parent mean age was 38.4 years (SD 9.0); 73.1% reports were completed by only the mother. Mean child age was 11.4 years (SD 1.0); 55.1% girl; 70.5% live with their parents and 19.9% live only with their mother. The mean-intake of sweet beverages reported by the children was significantly lower than reported by their parents: 33.2% of the children indicated to consume at least one sweet beverage every day; parents reported 54.6%. The child and parent reports differed significantly with respect to the determinants ‘availability’, ‘attitude’, ‘habit strength’, ‘rules’, and ‘accessibility’ (p=0.01). The Interclass Correlation Coefficients between child and parent reports were weak (ICC range between 0.09 - 0.31; p=0.05).

Conclusions: Reports regarding the consumption of sweet beverages significantly differ between parents and children. The level of agreement between parent and child reports is weak and needs further study.
Discrepancies in observed and reported eating behavior of primary-school children at break-time during schooldays.

Authors: Vivian VMJ van de Gaar, Hein H Raat, Lyne LMG Blanchette, Cornelis C Krul, Wilma W Jansen

**Purpose:** The purpose of this study was to determine the level of agreement between observed and reported eating behavior of 9 to 13 years old schoolchildren during break-time.

**Methods:** Schoolchildren were observed with respect to their consumption of snacks. Afterwards, the children themselves completed questionnaires regarding the items related to (determinants of) eating behaviors (based on the EnRG-model), and general demographics. Only matched observed-reported pairs were included in the analyses (n=412 pairs). To assess the level of agreement between observed and reported intake, paired t-tests and Cohen’s kappa’s were used.

**Results:** Mean child age was 11.4 years (SD 1.0); 54.3% girl; 87.6% Dutch; 69.7% live with both parents and 18.7% live only with their mother. Data from observations show that 50.2% of the children eat sandwiches, 24.5% eat fruit or vegetables, 29.6% eat other sorts of snacks and 1.9% eats nothing during break-time. The reported data show a percentage of 60.9% for sandwiches, 35.0% for fruit or vegetables, 38.5% for other sorts of snacks and that 5.6% eats nothing. These differences in data were significant (p=0.01). The level of agreement for sandwiches was 72.4% (\(\kappa = 0.45; p=0.01\)), for fruit and vegetables 78.0% (\(\kappa = 0.48; p=0.01\)), for not eating anything 95.8% (\(\kappa = 0.44, p=0.01\)) and for other sorts of snacks 70.3% (\(\kappa = 0.32; p=0.01\)).

**Conclusions:** Children may overestimate their own intake of snacks at school. Observed and reported eating behavior differed significantly. Therefore, it is recommended when assessing snack intake during break-time at school, to use observed instead of self-reported data among schoolchildren.
Enhancing Sensitivity of the Youth Risk Behavior Survey to Monitor Dairy Group Intake of 8th-12th grade students in Pennsylvania Supplemental Nutrition Assistance Program Education (SNAP-Ed)

Authors: Judy Gromis, Christine M Least, Denise Wall, Barbara A Lohse

**Purpose:** Revise a nutrition behavior monitoring tool to improve the sensitivity for assessing dairy group intake of 8th-12th grade students.

**Methods:** Pennsylvania SNAP-Ed’s Nutrition and Physical Activity Survey, administered annually to a sample of participating students in grades 8-12, includes nutrition items from the CDC Youth Risk Behavior Survey. The CDC survey asks only one item related to dairy group intake (How many glasses of milk did you drink?). Items from a calcium food frequency questionnaire previously validated by researchers at the University of Minnesota were added to the 2011 Nutrition and Physical Activity Survey to provide a more accurate measure of dairy intake. Students (n=907) in 30 classrooms from 8 school districts completed the survey.

**Results:** The sample was primarily (77%) 8th grade students (mean age 14.4 years, 50.7% female). Students with complete responses for six dairy items (n=629) consumed an average of 2.69 ± 1.93 cup equivalents per day from the dairy group; 34.8% consumed recommended intake of 3 cup equivalents daily. Comparison with data from previous years (milk item only) showed the 2011 survey detected twice the percentage of students meeting recommended daily intake (15.4% and 16.0% for 2010 and 2009 surveys, respectively). The greatest contribution to increased sensitivity came from additional items capturing cheese and ice cream consumption (0.6 and 0.4 cup equivalents).

**Conclusions:** Adding six dairy items to a nutrition behavior monitoring survey substantially increased the measurement sensitivity for dairy group intake without affecting feasibility of survey administration in a classroom setting.
Development, Validation, and Reliability of the CKinnect-Ed Survey Tools

Authors: Ashley Kirby, Sarah Woodruff

Purpose: The CKinnect-Ed nutrition and cooking intervention was recently developed and will be delivered nationally in the upcoming years. In order to assess the success of the program, the purpose of the current study was to develop the pre-test, post-test, and parental CKinnect-Ed surveys and establish content and face validity and test-retest and internal consistency reliability.

Methods: Survey questions were developed based on published surveys and some new questions were developed based on the current objectives. Content validity was examined using an expert panel (~10 PhD’s/experts in the field). Participants (~n=100 10-14 years and ~n=25 parents) were recruited from after school programs in Southwestern Ontario, Canada. Face validity was evaluated using cognitive testing interviews among the intended target audience. In order to assess test-retest reliability, participants filled out each survey two separate times one week apart. Bivariate correlations (p= 0.05) using Pearson correlation coefficient and crosstabs using Phi were used to assess test-retest reliability. The homogeneity of certain questions (internal reliability) was calculated using Cronbach’s coefficient alpha to determine if all questions are necessary. Descriptive statistics were used to calculate the percentage of participants that answered the “yes/no” questions the same and consistency was assessed.

Results: Pending data collection December 2011-January 2012.

Conclusions: The valid and reliable surveys will be used in a national study in the coming years to examine the effectiveness of the CKinnect-Ed program in improving family meals, food preparation, and overall diet quality in young adolescents.
Engaging stakeholders in community-level obesity prevention programming: Evaluation of the San Antonio Fit Family Challenge

Authors: Gerardo Pacheco, Jennifer L Shaw, Anna Gonzalez, Carol Smith

Purpose: Translating available research into practice and applying principles of community engagement can be difficult. Thus, an academic-community partnership was formed to evaluate the feasibility and effectiveness of a short-term, family-based, obesity prevention program in a school setting. The aims of this research were to document: 1) changes in biometric measures, goal setting, physical activity and nutrition behavior, and journaling and 2) experiences of community partners in assisting with program design, implementation, and evaluation.

Methods: A pre-post outcome evaluation of the Fit Family Challenge program was conducted using at least 10 families in seven San Antonio, Texas school districts. BMI, waist-to-hip ratio, body fat, blood pressure, and cardiorespiratory fitness measures were collected. Adults were surveyed for knowledge, attitudes, beliefs, and behavioral indicators related to obesity. Additionally, qualitative data was collected by phone interview with school district coordinators implementing the program.

Results: Pre-assessment data was collected for 260 individuals and post-assessment data for 85 individuals. Although significant biometric changes were not observed, changes in self-reported healthy nutrition and physical activity were noted. Appropriate goal setting and goal attainment were major program successes.

Conclusions: Practical considerations and lessons learned from community-level obesity research are the key contributions, given the limitations of this study. Short-term obesity programs can raise awareness and initiate behavioral change among participants and community partners. There is much benefit from scholastically engaged community members and the role of their social support in preventing obesity.

Authors: Yuchen Cui, Margarita Santiago, Dale A Schoeller, David Allen, Aaron L Carrel, Jessica Guo, Angelica Delgado Rendon, Magdalisse Gonzalez

Purpose: This study introduces a novel self-report instrument to measure children’s time use patterns and examines the relationships between time use and children’s risk for diabetes.

Methods: Our time-use reporting instrument utilizes a series of timelines representing a day, each corresponding to a unique activity category such as studying, TV-watching, and active-travel. Study subjects were asked to color the time periods during which they undertook the corresponding activity. 188 students (53% females) aged from 10 to 15 from the Bruce Guadalupe School (Milwaukee, WI) participated. Their time-use data for two weekdays and one weekend day were collected and assessed against measurements of their fitness level and insulin resistance.

Results: The reliability assessment of this instrument indicated a moderately reproducible procedure (intraclass correlation coefficient $r > 0.6$) for six out of ten activity categories. Younger children were more physically active than older children. Boys spent more time in video-game playing while girls spent more time in phone use. Children who spent longer hours in organized sports were also spending more time in both physically active and inactive travel. Time spent on active travel was positively correlated with PACER scores. Time spent on computer use was associated with insulin resistance.

Conclusions: This instrument is particularly useful assessing children’s time use patterns for specific sedentary activities, which are typically difficult to assess using GPS loggers and accelerometers. Such data provide valuable insights into how children organize their day. This temporal context is critical for effective formulation of interventions targeting physical activity in children.
Computer Learning Modules on Portion Sizes and Exercise

Authors: Joseph M Magness, Clare C Brown, Bethany C Cheshire, Cheryl Scheuter, Wendy Ward-Begnoche

Purpose: There is a strong need for supplemental educational materials for use in the prevention and intervention of pediatric obesity. These modules will serve as learning opportunities for parents and also those from the Hispanic population through Spanish versions of each module. The modules are designed to provide relevant information for use in multiple settings.

Methods: The computer learning modules were first drafted with educational information. Then, photographs, video, and weblinks for more information were added to provide supplemental material for the user. Further, fun, interactive activities were provided that allow rehearsal of information to promote retention of the material. The modules are easy to understand and available on the web free for use. There are Spanish versions available for all modules. Built into each module is a pre and post-test designed to measure familiarity with each topic, with scores for each being analyzed to determine educational impact and user satisfaction of the modules.

Results: Pilot data is currently being gathered regarding educational impact on users of the modules, as well as user satisfaction with the module itself. We will be able to demonstrate the modules during the conference and provide results of preliminary data.

Conclusions: As supplemental aids, these modules are a beneficial tool in prevention and intervention community efforts as well as opportunities for educating parents and pediatric patients within medical settings. The Spanish translations of these modules offer an added opportunity to educated Hispanics about obesity problems and their treatment, helping to reduce health disparities.
An Investigation of the Effects of Physician Directed Health Lifestyle Counseling on Patient Health Indicators

Authors: Marcel Aucoin

Purpose: Physicians have the opportunity to provide lifestyle counseling but there is limited evidence supporting the long term effects of brief counseling by a physician (Eden et al. 2002). Evidence suggests that properly structured counseling can have positive lifestyle effect (Spink & Wilson, 2010). The research presented here examined the effects of a physician directed, lifestyle counseling supplemented with continued contact and group sessions. It was hypothesized that spending dedicated time with patients would have positive effects on lifestyle behaviors and clinical health indicators.

Methods: Fifty volunteers were recruited from a rural family practice with 47 remaining after one year. Counseling and evaluation occurred within the normal scope of practice. Evaluation was completed prior to the intervention, at three, six and twelve month. Evaluation included a physical assessment, blood chemistry, Seven Day Recall of Physical Activity, Short Dietary Assessment of Fruit and Vegetable Intake and Percent of Calories from Fat. Repeated Measures ANOVAs were analyzed.

Results: Trends were demonstrated for dietary and physical activity lifestyle behavior without statistically significant change. In Conflict significantly positive changes were demonstrated for clinical health indicators including the LDL/HDL Ratio, LDL, HbA1C, waist circumference, BMI, weight and resting blood pressure.

Conclusions: Within this practice physician counseling had an effect on health indicators. The effect was not demonstrated in lifestyle behavior. It is suspected that the effect on physical activity and diet was limited due to self-report measurement issues. This research deserves repeat with objective measurement of behavior. Exploration should investigate integrating counseling into primary care practice.
The Socio-Ecological Approach to Healthy Lifestyles: What do nutrition practitioners need to become environmental change agents?

Authors: Katherine L Dickin, Jamie Dollahite

Purpose: There is growing awareness of the relevance of socio-ecological approaches in public health, but prevention focusing on environments presents new challenges and requires different skills than those associated with traditional nutrition interventions. Guided by the Theory of Planned Behavior (TPB), this study investigated factors associated with community nutrition practitioners’ use of environmental strategies to prevent obesity.

Methods: Seven Cooperative Extension nutrition professionals (NPs) were purposively selected to reflect use and non-use of environmental strategies and rural or urban practice. In-depth, semi-structured interviews elicited perceptions of factors facilitating or hindering strategy use. A survey administered to all 56 NPs in NY State investigated relationships of background factors and TPB constructs to use of environmental strategies.

Results: Interviews identified key factors in environmental strategy use. Survey results confirmed qualitative findings, showing degree of involvement in environmental change activities was predicted by TPB constructs of social norms (supervisors’ expectations) and perceived control (community’s readiness to change), as well as background factors: degree of networking with partners, program size, funding to support time for environmental work, and belief in the influence of environments. Supervisors’ expectations mediated the effects of funding (p<0.05) and program size (p<0.1); perceived community readiness mediated the effects of funding (p<0.1). Networking with community partners was an important modifier such that high levels of networking were required to see program size and funding effects.

Conclusions: To facilitate shifts in practice to include environmental change approaches, changes are needed in job expectations, time allocation, and skill development in networking/collaborating with a variety of community partners.
Development and formative evaluation of a computer-tailored physical activity education program for hospitalized heart failure patients: An intervention mapping approach

Authors: Rony Oosterom-Caló, Saskia J te Velde, Johannes Brug

Purpose: Physical activity (PA) is important and beneficial for heart failure (HF) patients. The current work will describe the development of an intervention aimed at promoting PA among hospitalized HF patients including preliminary steps in the formative evaluation of the intervention.

Methods: We applied the Intervention Mapping (IM) protocol. This entailed performing a needs assessment, defining change objectives, selecting determinants and strategies and developing the materials. We performed a systematic literature review, relied on Social Cognitive Theory and interviewed patients and professionals to select behavioral determinants and strategies.

Results: The change objective defined was ‘patients consistently conduct mild PA on most days of the week for approximately half an hour’. Hospitalized patients cannot start performing PA, so the intermediate aim was intentions to perform PA after discharge since the Theory of Planned Behavior indicates that intention is the closest behavioral determinant. The selected determinants were practical knowledge on PA performance, self-efficacy for, and perceived benefits of, PA. The intervention included: 1) a video with actors (as role models) demonstrating the behavior, 2) a practical knowledge module, including assessments and tailored feedback, and 3) a self-efficacy module, including assessments of self-identified barriers to PA and tailored feedback to overcome the barriers. We pre-tested the assessments and feedback on patients and made adjustments accordingly.

Conclusions: The systematic development of the computer-tailored PA program for hospitalized HF patients using the IM protocol resulted in a theory- and evidence-based intervention. The appreciation, usability and efficacy are yet to be determined in a trial.
Alpha test of a video game to train parents in effective vegetable parenting

Authors: Alicia Beltran, Teresia M O’Connor, Sheryl O. Hughes, Janice C Baranowski, Theresa A Nicklas, Deborah Thompson, Tom Baranowski

**Purpose:** Alpha test one episode of a casual video game smart phone application, called Kiddio Food Fight™, targeted at training parents to increase their 3 to 5 year old child’s vegetable consumption.

**Methods:** Cross-sectional design; 16 parents from three ethnic groups living with their 3-5 year old child were recruited. Parents provided screening information, informed consent and played the video game. Afterwards, semi-structured intensive interviews were conducted about their experience.

**Results:** Parents generally liked the game. Their suggestions included a reduced list of values and rewording of reasons statements; and, improved storyline and performance feedback during and at the end of the game. The game scoring system was ignored or confusing. Problems with the tool bar and game navigation caused problems with game performance. A tutorial was requested.

**Conclusions:** Kiddio Food Fight™ could have positive acceptance among parents with minor modifications. A video game play could help parents learn effective vegetable parenting practices.
The accuracy of predicting body fat percentage using published BMI and BIA equations in a sample of African American women

Authors: Ygnacio Lopez III, Daniel P. O'Connor, Tracey A. Ledoux, Rebecca E. Lee

Purpose: Few studies have determined whether common methods to estimate body fat percentage are accurate among African American women. The purposes of this study were (1) to determine whether published body mass index (BMI) and bioelectrical impedance analysis (BIA) equations accurately predicted dual energy x-ray absorptiometry (DXA) body fat percentage values and (2) to estimate new BMI and BIA equations in a sample of African American women.

Methods: Body fat was estimated using published BMI and BIA equations for 74 African American women (M= 47.6 years, SD= 7.7). Linear regression was used to determine how accurately ten BMI and BIA equations predict DXA body fat percentage values in our sample, and new BMI and BIA equations were created using DXA body fat percentage values as the dependent variable.

Results: Women were classified as overweight or obese (M BMI= 35.4, SD= 8.2). R2 and SEE values indicated that all of the tested BMI and BIA equations had poor fit in our sample. We derived a new BMI equation that has a better fit and was more precise than the published equations.

Conclusions: All ten published BMI and BIA equations inaccurately estimated DXA body fat percentage values in our sample. Our new BMI equation has less estimation bias and more precision than the published BMI equations and may be used as an alternative to DXA in African American women.
A review of built environment measures in older adult physical activity and health studies

Authors: Peg Allen, Christine M. Hoehner, Ross C. Brownson

Purpose: Despite the growing interest in built environment (BE) research, sparse research exists on BE measures in older adult studies. The purposes of this review are to describe available BE measures, identify measurement gaps, and inform methodology improvement for future research.

Methods: Multiple databases were searched for the literature review. Inclusion criteria were studies that tested relationships of the BE with physical activity, physical or cognitive function, or health among adults aged ≥ 55 years, published 2000-2011 in English in peer-reviewed journals. Reviews and qualitative studies were excluded.

Results: Forty-one of 115 studies meeting inclusion criteria were conducted outside of the U.S. Measures derived mostly from disability or non-gerontology ecological models, with variability in how measures were operationalized. Few of the 38 studies employing non-census GIS-based measures reported efforts to verify or improve completeness and accuracy of non-research archival data. Twenty of 80 studies with perceived BE measures used scales from the well-tested Neighborhood Environment Walking Survey (NEWS). NEWS and twelve additional questionnaires had test-retest scale reliability in the moderate to high range. The eight environmental audit instruments assessed multiple domains, including quality of street-scale features. Walkability and presence of recreational, retail, and service destinations were well assessed at a community-scale for urban design and land use policies but few street-scale measures addressed older adults’ varying gait speeds and functional abilities.

Conclusions: Future BE research with older adults can be enhanced through adaptation of well-studied perceived BE measures for older adults combined with modified environmental audit or GIS measures.
The short-term effect of an implementation intention intervention to increase physical activity among obese older adults

Authors: Ariane Bélanger-Gravel, Gaston Godin, Andrea Bilodeau, Paul Poirier, Gilles-R Dagenais

Purpose: Physical activity is a major cornerstone of healthy aging. However, significant proportions of obese and older adults are inactive. Although implementation intentions (II) represent a promising strategy to increase physical activity, this technique has seldom been applied in the treatment of obesity. Thus, the aim of this study was to test the short-term effect of an II intervention on physical activity among obese and inactive older adults.

Methods: At baseline, 101 obese older adults were randomised to an experimental or a control condition. All participants attended three counselling sessions. Those in the experimental group completed the II task in addition to the common intervention activities. Leisure-time physical activity (LTPA) was self-reported at post-intervention. Objective measures of the behaviour were also obtained by means of a pedometer and a fitness test. Mixed model repeated-measures ANOVAs were used to evaluate the effect of the intervention.

Results: The mean age and body mass index of the sample were 59.4±5.2 y and 33.5±3.2 kg/m², respectively. The attrition rate was 12.9%. No main effects for II were observed for all outcomes (ps>.29). However, significant within-group effects were detected for LTPA and physical fitness (ps<.0001). A trend was observed for the time X group interaction on the number of steps/day (p=.12).

Conclusions: Results showed that this two-month intervention contributed to increasing the physical activity level and physical fitness of obese older adults. This suggests that very short interventions could successfully promote active living among this population. However, II seems to have limited effects.
Tracking Adolescents’ Daily Physical Activity by Global Positioning and Accelerometer.

Authors: Nicolas M Oreskovic, Jeff Blossom, Jonathan P Winickoff, Alison E Field, James M Perrin, Elizabeth Goodman

Purpose: Physical activity (PA) declines as children become adolescents. Developing better methods to objectively assess where adolescents engage in PA throughout the day would aid in better understanding which spaces most promote adolescent PA. We compared the feasibility of collecting objective PA data from adolescents to a traditional self-reported activity log.

Methods: Objective and subjective PA and location data were collected by accelerometer and Global Positioning Systems (GPS) and self-reported PA log, respectively, on 86 adolescents aged 11-15 years in 2011. Subjects also completed baseline and exit surveys. Paired t-test and chi-square tested bivariate associations.

Results: The sample included adolescents ages 11(37%), 12(25%), 13(22%), and 14(16%); 44% were male, 44% White, 20% Black, 35% Hispanic, and 47% overweight or obese. Half (53%) reported walking or biking to or from school at least 1 day/week, and 51% reported being regularly physically active in their free time. Objective PA data was captured on 80% (n=69), and 74% (n=64) returned self-reported PA logs. Subjects provided a mean of 7.6 (range:1-11) days of objective PA data vs 3.9 (range:0-9) days of self-reported log data (p<0.0001). Almost all (91%) felt the objective instruments were easy to use, while only 67% reported that self report logs were easy to use (p=0.006). Only 6% felt wearing the equipment caused problems with parents, teachers, coaches, or friends.

Conclusions: Adolescents found wearing an accelerometer and GPS easy and acceptable. Combined objective PA and location data offers the unique benefit of yielding important insights into which spaces adolescents use for physical activity.
Test-retest Reliability of a Youth Physical Activity Supports Questionnaire

Authors: Sandy J Slater

Purpose: To develop and test the feasibility, reliability and validity of a self-reported questionnaire on home, school and neighborhood physical activity environments for youth located in low-income urban neighborhoods of color and rural areas.

Methods: Third, 4th and 5th grade students were recruited from six purposively selected elementary schools (3 urban and 3 rural). Students were asked to complete a 160-item take-home survey. A total of 253 students (approximately half the sample was classified as overweight or obese) participated in the test-retest reliability of the 160-item take home questionnaire. Inter-rater reliability was assessed by calculating either ICCs or Cohen’s Kappa statistics and percent agreement for survey measures.

Results: Preliminary results show, on 58 percent of the survey questions, youth had almost perfect to moderate reliability. Results vary by urbanization with 61 and 46 percent of the questions receiving almost perfect to moderate reliability for rural and urban youth respectively. Questions with almost perfect to moderate reliability primarily asked about physical activity supports and media equipment available in the youths’ home and at their school. Questions with fair to poor agreement primarily asked about social support and physical activities youths participated in during the last week. Specific differences in urban and rural reliability will be presented.

Conclusions: More than half of the survey questions received good test-retest reliability scores. Next steps include validating youths’ responses against parent and school administrator surveys, and neighborhood built environment assessments, as well as exploring urban and rural differences in home, school and neighborhood physical activity supports.
Steps that count: The development of a pedometer-based health promotion intervention in an employed, health insured South African population

Authors: Julian David JD Pillay, Tracy T Kolbe-Alexander, Karin I Proper, Willem W van Mechelen, Estelle V Lambert

Purpose: The emergence of pedometers as a self-monitoring and motivational aid for physical activity (PA) has been widely demonstrated as a complementary tool. There is still paucity in knowledge on how people change their PA behavior during pedometer-based interventions. The aim of this study is therefore to develop a 12-week, pedometer-based intervention (titled “steps that count”) that examines the effectiveness of pedometer feedback and individualized, brief tailored feedback on daily PA, in an employed South African population.

Methods: The proposed study is a randomized controlled trial (N=400) in a worksite setting, using pedometers and individualized feedback to increase steps/day. Participant selection will be based on recent health risk appraisal data (“high-risk” for cardiovascular disease) and readiness for change. Simple messages to improve daily PA will be provided (in keeping with the 30 minutes moderate-intensity PA five times/week recommendation) following a seven-day blinded pedometer-wear (week 1). Participants will then be randomly assigned to the intervention group (IG) or wait-listed control group (CG). The IG will subsequently wear an un-blinded pedometer for 10 weeks. Tailored messages based on pedometer data (IG) and general supportive/motivational messages (IG+CG) will be provided at weeks 3, 5, 7, 9 and 11; 7-day blinded pedometer-wear follow-up at week 12 (IG+CG).

Results: The purpose of this paper is to outline the rationale and development of an intervention aimed at improving steps/day in an employed population.

Conclusions: Pedometer-based physical activity and individualized feedback may be a practical and easily applied intervention.
Reliability evidence for the physical environment component of the HomeSTEAD instrument

Authors: Derek Hales, Christina P McWilliams, Stephanie Mazzucca, Dianne S Ward

Purpose: Examine reliability evidence for physical environment items from a new home environment questionnaire (HomeSTEAD).

Methods: The HomeSTEAD questionnaire contains items related to the physical and social environment around food and physical activity in the home. For this study about 200 physical activity items related to presence, location, usability, and access to portable play, media, and exercise equipment, and the natural environment around the home were identified. To assess reliability, intraclass correlations (ICC), kappa, limits of agreement, correlations, and mean comparisons were estimated. Single measure ICCs are presented, because they best represent the intended use of the questionnaire (single-administration). Parents responded to items on three occasions.

Results: Surveys were completed by 127, 116, 115 parents at times 1, 2, and 3. The sample was mostly mothers (90%), 25% Black, 31% income<$50,000, and 61% working. Children were 7.12±2.97 y (even distribution 3-to-12 years); 49% were female. ICCs ranged from -0.152 to 1.00, mean=0.68. Seventy-percent of items had ICCs>0.60 (40%>0.80). For the mean comparisons no statistically significant differences were found, p-values from 0.08 to 1.00 (mean=0.722). Lower reliabilities were seen for ratings of equipment condition/usability (e.g., twirling play equipment). These items had fewer respondents and very low between person variation.

Conclusions: The results suggest strong reliability evidence for this set of items, supporting a single administration format. Items with lower reliability estimates tended to have less between person variation, meaning that while responses for a given parent varied little over time almost everyone was responding the same way to the item.
Validity of a Previous Day Recall to Measure the Duration, Location and Purpose of Active and Sedentary Behaviors

Authors: Kate Lyden, Amanda Libertine, Sarah Kozye-Keadle, Patty Freedson, Charles Matthews

**Purpose:** Previous day recalls (PDR) are self-report tools for quantifying time in sedentary and active behaviors. The PDR can also be used to collect information about the context in which behaviors occur. This study evaluates the validity of the PDR to: (1) distinguish sedentary and active time, and (2) identify the location and purpose of behaviors.

**Methods:** Participants’ (15 adolescents, 15 adults) free-living behavior was directly observed (DO: criterion measure) on 1-3 occasions. Observers used a personal-digital-assistant with focal sampling and duration coding to record the body position, location and purpose of all behaviors. Data were collected over 54 observation periods (mean minutes ±SD: 242.0±89.7). One day after DO, an unannounced PDR was administered to elicit reports of the duration, location, and purpose of specific behaviors. Linear mixed-effects models were used to compare DO and PDR estimates of sedentary and active time. Kappa statistics (?) were used to evaluate the agreement between measures by location and purpose.

**Results:** The PDR accurately estimated sedentary and active time (%bias±SD: adolescents 20.4±30.6 and -10±60.4%, respectively; adults 8.2±30.4 and -6.8±52.0%, respectively). Agreement for location was 88.9% (kappa=0.77) and 90.1% (kappa=0.77) for adolescents and adults, respectively. Agreement for purpose was 86.4% (kappa=0.72) and 85.2% (kappa=0.67) for adolescents and adults, respectively.

**Conclusions:** The PDR is a valid tool for distinguishing sedentary and active time and for identifying the location and purpose of behaviors. Obtaining behavior-specific contextual information is a unique feature of the PDR that may have great value to surveillance and intervention researchers.
The influence of fitness status on self-reported and objective measures of physical activity

Authors: Simone Tomaz, Tracy T Kolbe-Alexander

**Purpose:** The main aim of this research study was to determine whether the relationship between self-reported and objective measures of PA is attenuated by an individual’s fitness level.

**Methods:** A convenience sample of 113 participants with varying physical fitness was recruited. Participants completed a Health Risk Appraisal, the Global Physical Activity Questionnaire (GPAQ), and did a 12-minute step test to measure fitness. They wore an accelerometer for 7 consecutive days, and a minimum of four days of wear with 600 minutes per day were required for data analysis. Accelerometer data was analysed according to Matthews (2005) cut points. ASCM criteria were used to define fitness level with the High Fit (HF) participants having a VO2max above the top 50th percentile and the Low fit (LF) scoring below the 50th percentile.

**Results:** Participants were 37.8 ±12.7 years old, with men slightly older than women, (n=52; 38.8 SD) (n=61; 37.2 SD). The HF group (0.87±0.56) reported significantly more vigorous PA than the LF group (0.44±0.48; p=0.00007). Similarly, moderate intensity travel time and total MVPA was significantly higher in the HF group, 0.26±0.45 vs 0.09±0.24;p=0.034 and 2.53±2.10 vs 1.27±0.99;p<0.001, respectively. The difference between objectively measured and self-reported vigorous PA was significantly lower in the LF group (-62.76±94.37) than the HF (-211.58±281.03;p=0.001).

**Conclusions:** The fitter participants had significantly higher levels of objectively measured PA than the LF. The difference between self-reported and objective measures of vigorous PA was significantly lower among the LF group, suggesting fitness may play a role in accuracy of recall of PA participation.
**NUTRITION: ADULTS**

**P-053**

**A STUDY OF METABOLIC SYNDROME AND PHYSICAL ACTIVITY IN INDIAN ADULTS**

Authors: Mahak M S Sharma, Ranjana R M Mahna

**Purpose:** Asian Indians have a high predisposition to metabolic syndrome due to a marked shift in lifestyle caused by economic growth, urbanization and dietary westernization. The present study was done to assess the association of physical activity and metabolic syndrome in an urban Indian adults.

**Methods:** A hospital based study was conducted with 996 subjects. The subjects comprised 498 (40.8% males and 59.2% females) with metabolic syndrome (MS) by NCEP (ATPIII) criteria. An equal number of non metabolic syndrome (NMS) subjects matched for age and gender were taken. Anthropometrics, glucose and lipid profile were assessed. Physical activity assessment was done by a suitable structured questionnaire and Physical Activity Level (PAL) was calculated.

**Results:** Biochemical parameters showed elevated blood glucose in 60%, elevated triglycerides in 50%, reduced HDL in 96% and elevated blood pressure in 55% of the MS subjects. Waist circumference showed abdominal obesity in 85% of MS subjects. There was a significant difference (p<0.00) in the PAL value of MS and NMS subjects, indicating that MS subjects were sedentary as compared to NMS. Moreover, MS subjects had not been physically active/ reduced physical activity over the past few years. The mean MET/Week was lower for MS subjects. The odds ratio relating to physical activity was 1.37.

**Conclusions:** The study reviled that sedentary lifestyle and lack of physical activity are associated with the occurrence of metabolic syndrome.
Adoption and maintenance of small eating behavior changes: physical and social barriers and enablers among low income overweight adults

Authors: Johanna DC Eldridge, Carol M Devine, Luz Aceves, Elaine Wethington, Erica G Phillips-Caesar, Mary E Charlson

Purpose: To understand the experience of adoption and maintenance of experimentally-based small change eating behaviors in a pilot weight loss intervention among residents in two low income New York City neighborhoods.

Methods: 46 men and women (mean age 51, mean initial BMI 34, 56% Black, 44% Hispanic), enrolled in a pilot community weight loss intervention trial facilitated by community health workers (CHW), were interviewed after 12 weeks. Open-ended questions investigated barriers and enablers to the adoption and maintenance of one small eating behavior change strategy. Verbatim transcripts were open-coded by two researchers using a content analysis approach.

Results: Adoption themes included: perceived ease of change, how well the new strategy fit previous weight control efforts, individual adaptation of the strategy, and communication about the strategy with family and friends. Maintenance themes included both physical and social feedback. Physical feedback included both positive and negative changes in appearance, pain, fullness, lightness, and weight. Social enablers included: accountability to CHW, comments on appearance, and opportunities for modeling. Social barriers included: non-normative eating, isolation from social eating, comments on appearance, a need for negotiation, and interference with family responsibilities.

Conclusions: Weight loss interventions using small change approaches should consider incorporation of strategies to: 1) help participants recognize positive physical and social changes, 2) communicate and negotiate effectively with family and friends about strategies, and 3) anticipate and cope with negative social feedback.
Sex-related differences in appetite sensation responses to the Mediterranean diet

Authors: Alexandra Bédard, Anne-Marie Hudon, Sylvie Dodin, Louise Corneau, Simone Lemieux

Purpose: The adoption of the Mediterranean diet (MedDiet) has been demonstrated as an effective tool for weight management. However, it is not known whether the MedDiet has similar effects on hunger and satiety sensations in men and women. The objective of this study was to investigate sex-related differences with regard to appetite sensation changes in response to an isoenergetic MedDiet.

Methods: Thirty-seven men and 32 premenopausal women consumed a 4-week isoenergetic MedDiet in which all foods and drinks were provided. Visual analogue scales were used to measure appetite sensations before and after each meal consumed on the Wednesday of the fourth intervention week. The satiety quotient was calculated for each meal.

Results: Similar decreases in desire to eat, hunger and prospective food consumption were observed in men and in women in response to test meals, except for desire to eat and hunger measured at lunch, women having more important decreases than men following lunch consumption (respectively P=0.0471 and P=0.0305). Moreover, the satiety quotient of lunch and dinner was higher for women than for men (respectively P=0.0038 and P=0.0004), but these differences disappeared after controlling for gender differences in daily energy intake. The satiety quotient of each meal was negatively associated with daily energy intake, but only in men (P<0.05).

Conclusions: These results suggest that sex differences in changes in desire to eat and hunger may exist in response to a Mediterranean meal. Furthermore, the lack of association between satiety quotient and daily energy intake in women warrants further investigation.
Rerouting Eating Behaviors on the Road: A Preliminary Cost-benefit Analysis

Authors: Kirsten Corda, Merlin Tobar, Merelena de Leon, Caroline Roffidal-Blanco

**Purpose**: The final frontier in collegiate sports is nutrition. Organizations able to afford team dietitians may have the performance advantage; however, all athletic diets are impacted by coaches’ decision making processes about where teams will eat, especially on the road. The objective of this study was to evaluate and make reasonable changes to the restaurant stops of one Southwest university baseball team.

**Methods**: Three researchers, one strength and conditioning coach and a local health department registered dietitian identified the usual eating habits of players on the road. Tools used to make recommendations included: global satellite positioning applications, online menu nutrition information, and health department restaurant guidelines, i.e., “Por Vida” (=700kcals, =23 g total fat per meal).

**Results**: Each year, the team eats =48 times away from home. Favorite meals: fried chicken, fajitas, bbq (1579±440 kcals; 55.5±20g fat). Preliminary data analyses found healthier options within guidelines to be deliverable or within 1±0.6 mile in route. Differences in options providing adequate protein:fat ratio for athletes: -700±200 kcals; -32±10g protein; -29±10g fat. Cost difference was not significant ($1.52±1.36). To increase calories, protein and hydration, low-calorie, nutrient dense snacks, e.g., fresh fruits, seeds/nuts and powdered drink mixes should be packed from home. Anecdotal evidence suggested that coaches and players lack basic nutrition knowledge but coaches dietary behaviors will be harder to change.

**Conclusions**: Athletes eating on the road have healthier options near-by at relative the same costs. These findings among those that are neither strength nor endurance athletes may be useful for intervention development among other adult populations.
Reducing Dietary Fat Intake in African American Women through a Tailored, Community Health Care-Based Intervention and Telephone Counseling

Authors: Amanda C McClain, Sara Wilcox, Debra Parra-Medina, Jennifer J Salinas

**Purpose:** To investigate the relationship between change in dietary fat intake and intervention type and dose in a randomized trial targeting African American women from community health centers.

**Methods:** The Heart Healthy and Ethnically Relevant (HHER) Lifestyle Program, a community health care-based intervention to promote CVD risk reduction in African American women, randomized participants to either standard care or a comprehensive intervention. Comprehensive intervention participants received standard care (stage-matched provider counseling and assisted goal setting) plus 12 months of tailored, stage-matched telephone counseling and newsletters. The Dietary Risk Assessment (DRA) evaluated dietary fat in five areas: Total Fat, Meats, Starches, Dairy, and Added Fat. Number of completed calls was tracked during the 12 months. Linear regression was used to account for education, age, employment, income, marital status, and baseline BMI.

**Results:** A total of 266 women were randomized, with 247 included in the analysis. Half of participants were employed and most were obese (>30 kg/m2) with annual household incomes <$30,000. At 12 months, comprehensive intervention participants reported significantly lower Total Fat intake and Added Fat intake than standard care. Comprehensive intervention participants completing a greater number of telephone calls reported significantly lower Total Fat intake and lower Meats, Dairy, and Added Fat intake than those completing fewer calls.

**Conclusions:** Standard primary provider counseling plus telephone counseling can help lower total fat and added fat intake in African American women. Furthermore, higher doses of telephone calls can further reduce dietary fat by lowering total fat, meat, dairy, and added fat intake.
A model for adolescent obesity prevention using professional athletes

Authors: Katie McInnis, Roberta A Anding, Margaret E Briley, Connie Wiemann

Purpose: The overall goal of this study is to determine the effect of professional athletes as positive health role models on adolescent obesity prevention.

Methods: The Houston Texans TwEAT Healthy Program© (THP) will pair subjects (age 11-14) with a professional football player to encourage the adolescents to obtain their health goals through personal interaction. Overweight adolescents (n=60) will participate in a 12-week program and be divided into two groups: 1) standard of care supplemented with nutrition/exercise messages from a Registered Dietitian (n=30) and 2) standard of care plus the THP (n=30). The THP will include a kick-off event, motivating messages via Twitter™ (3x/wk), and video messages (2x/wk). All messages will be based on the Social Cognitive Theory, and address constructs of role modeling, self-efficacy, goal setting, outcome expectations and stimulus control.

Results: Limited studies exist exploring similar programs but indicate feasibility and improvement in nutrition/exercise knowledge (14.6%; p < .05) and behaviors (5.8%; p < .05) as established by Irwin (2010).

Conclusions: The results demonstrate the effect of a healthy lifestyle program using professional athletes on changes in nutrition/exercise knowledge, diet quality and physical activity patterns. This study will also examine body weight status and nutrition/exercise attitudes and beliefs to further examine the effects of the program. Role modeling by professional athletes provides a feasible and acceptable way to combat obesity, and a financially viable way to disseminate health information to a large audience from influential public figures.
Ten-year Longitudinal Predictors of Overweight in Young Adulthood

Authors: Virginia Quick, Katie Meyer, Nicole Larson, Melanie Wall, Jess Haines, Dianne Neumark-Sztainer

Purpose: To identify predictors of overweight in a large, population-based cohort followed over ten years during the transition from adolescence to young adulthood

Methods: Data were from Project EAT (Eating and Activity in Teens and Young Adults) a diverse prospective cohort of 2,065 adolescents and young adults (54% female). Participants completed baseline surveys from 1998/1999 (mean age=12.8) and follow-up surveys from 2008/2009 (mean age=23.2). Multivariable-adjusted linear regression was used to quantify associations between personal, behavioral, and socio-environmental factors at baseline and BMI at year 10, controlling for baseline BMI. Logistic regression was used to estimate adjusted odds ratios of 10-year incidence of overweight (BMI>25) among adolescents who were not overweight at baseline (n=1,537).

Results: The prevalence of overweight was 52% at the 10-year follow-up. In both males and females, weight control behaviors (e.g., fasting, dieting, binge eating), body dissatisfaction, weight concerns, weight teasing, and parental weight-related concerns/behaviors during adolescence were predictive of incidence of overweight and BMI gains in young adulthood. For example, non-overweight female and male adolescents with low body satisfaction had 1.5 greater odds of becoming overweight 10-years later. Additionally, in females, but not males, eating regular meals during adolescence predicted lower incidence of overweight and BMI in young adulthood.

Conclusions: Findings from this study indicate that to safeguard the health of youth later on in life, obesity prevention interventions among adolescents should focus on a non-dieting approach towards healthy weight management, promote positive body image and avoid negative weight talk.
**Foods children consume between meals: restrictive rules and instrumental and emotional feeding practices of Dutch mothers**

Authors: Lieke Raaijmakers, Dorus WM Gevers, Kathelijne KMHH Bessems, Dorit Teuscher, Stef PJ Kremers, Ronald Knibbe, Patricia Van Assema

**Purpose:** The aim of this study was to explore restrictive rules and instrumental and emotional feeding practices of Dutch mothers regarding their child’s food intake between main meals.

**Methods:** A cross-sectional questionnaire study was completed by 359 mothers of primary school children aged 4-12 years.

**Results:** Mothers used an average of 4.1 (SD 2.05) restrictive rules. Rules on not eating shortly before meals, not eating certain products too often and not eating too much of certain products were used by a majority. Restrictive rules applied especially to the intake of potato chips, nuts and savory snacks, candy and chocolate. The use of restrictive rules was associated with higher age, higher educational level and lower BMI of the mother. Instrumental or emotional feeding practices were reported by a minority and applied especially to candy, cookies and chocolate. The use of instrumental and emotional feeding practices was associated with lower age and lower educational level of the mother.

**Conclusions:** Further research is needed to assess the possible differences between having a rule and implementing it; and to examine the way mothers apply such rules in their daily routine. Furthermore, research should also identify which rules have the greatest influence on children’s dietary intake, so interventions can be targeted at stimulating certain restrictive rules because of their beneficial effect on dietary intake, while other rules should probably be discouraged. Interventions to reduce the use of undesirable instrumental and emotional feeding practices should be focused on the risk groups as identified in this study.
Fruit and Vegetable Exposure in Children is Linked to the Selection of a Wider Variety of Healthy Foods at School

Authors: Elizabeth Korinek, John B Bartholomew

**Purpose:** To examine fruit and vegetable home exposure in elementary children and the selection of FV and less familiar lunch entrées at school.

**Methods:** Cross-sectional data on 3rd, 4th, and 5th grade students (N=59). Home and school FV exposure was collected via self-report using a six-item questionnaire. Students were placed into high and low groups for 1) FV offered at home, and 2) FV eaten at home. Absolute and relative ratings of eight lunch entrées were collected through taste-tests conducted at school.

**Results:** Differences in the consumption of FV at school and the selection of lunch entrées between high and low groups were analyzed using Mann-Whitney U independent non-parametric tests. Results indicated that the distribution of consumption at school differed across high and low groups for parental offering of FV for: oranges (z=2.16, p<0.05), cucumber (z=2.44, p<0.05), pineapple (z=3.41, p=0.001), mandarin oranges (z=2.93, p<0.01), tomato (z=3.14, p<0.01), and broccoli (z=3.26, p=0.001). The distribution of consumption at school across high and low groups for eating FV at home was significant for 10 out of the 11 FV items. Likewise, significant differences between the groups for parental offering of FV were found for the selection of the chef salad (z=2.546, p<0.05), the Greek salad (z=2.091, p<0.05), and the veggie hummus plate (z=2.104, p<0.05). Absolute and relative ratings of eight lunch entrées are also reported.

**Conclusions:** Children who are more frequently exposed to FV at home consume a wider variety FV at school and are more likely to select healthy, less familiar entrées at school lunch.
**Formative Research for the GREEN Project: A communication campaign to improve the quality of food brought from home**

**Authors:** Jeanne P. Goldberg, Susan Koch-Weser, Sara Folta, Aviva Must, Steven A Cohen, Elena Naumova, Christina D Economos

**Purpose:** The GREEN Project tests a novel communications strategy combining nutrition and eco-friendly messages to improve the quality of foods that children bring to school. The strategy will be compared for effectiveness to one that uses nutrition-only messages. We report formative research results for campaign development.

**Methods:** Three rounds of focus groups with 3rd and 4th grade children were conducted. First, the acceptability of the strategy and children’s ideas about nutrition and eco-friendly behaviors were assessed. Next, foods and packaging were discussed to identify campaign concepts. Finally, four nutrition-eco and three nutrition-only concepts derived from earlier focus group discussions were presented as posters.

**Results:** Children were enthusiastic about combined nutrition-eco messages and had strong food and packaging opinions. Campaign concept posters using photos of the children proved distracting; children focused on details rather than the message. Final materials did not include images of the children, but “food faces” to direct attention to the message. The tagline from one poster, “the secret is in the lunchbox,” was especially engaging and provocative and was modified to: “The answer is in your lunchbox” for both campaigns. The nutrition-eco campaign theme was “Great taste, less waste;” the nutrition-only theme, “Foods to choose.” Images, themes, and taglines have been incorporated into all aspects of the intervention.

**Conclusions:** This presentation demonstrates the value of formative research in developing complex messages for children. The main intervention is currently underway, and it appears that materials and messages have been well accepted in the 7 schools where they are being tested.
Observations Of Gender Differences in Minority Children At Mealtime

Authors: J. Andrea Jaramillo Duran, Thomas G. Power, Sheryl O. Hughes, Susan L. Johnson, L. Suzanne Goodell, Kimberly A Williams, Leslie A. Frankel

Purpose: Very little is known about whether gender differences exist in the parent feeding domain. The objective of this study was to examine how parents feed boys and girls, and the behaviors of boys and girls during feeding.

Methods: Eighty African American and Latino mothers and their children (50% boys; 50% girls) in Head Start were observed and videotaped during mealtime. Tapes were coded by trained staff and inter-rater reliability was established for 20% of the tapes using Noldus software. 212 codes in 12 categories were used to code attempts to influence the behavior of one another, as well as other non-influencing verbal and non-verbal interactions. Negative binomial regressions were run to examine the effects of gender on mother and child behaviors.

Results: Mothers of boys were more likely than mothers of girls to teach eating skills, to help the child eat, to get the child to return to the table, to physically force the child to comply, and to get the child to stop eating or eat a different food. Boys were more likely than girls to attempt to get information from their mothers. Mothers of girls were more likely than mothers of boys to reason, demonstrate physical affection, and serve food more often.

Conclusions: Results suggest that mothers parent their boys and girls differently during mealtime. Mothers devoted a more directive effort to keep their boys at the table, to facilitate their consumption, and were more likely to restrict their eating. Boys may require more moment-to-moment management than girls at mealtime.
KINETI-KIDS II: EVALUATION OF THE USE OF WORKBOOKS AS COMPLEMENTARY NUTRITION EDUCATION STRATEGY IN SELECTED SCHOOLS NATIONWIDE

Authors: CELESTE C TANCHOCO, GEMMA P YUCHINGTAT, MINA GRACE C AQUINO, CONSUELO L ORENSE, MILDEGARDE C CAPISTRANO, MARILOU L MADRID

Purpose: The Kineti-Kids (KK) project proposed the use of student workbooks and teachers’ modules as tools for intervention for increasing knowledge in nutrition, physical activity and fitness so as to improve their nutritional status.

Methods: The study utilized the quasi-experimental design. Four pre-selected provincial schools and three Metro Manila pilot schools served as study sites. The three Metro Manila pilot schools were the same schools covered in KK I. Changes in nutrition knowledge were assessed in all study sites, while physical activity, dietary intake, weight, height and physical fitness were assessed in the selected Metro Manila schools. Study participants were all pupils in randomly selected sections from each grade level.

Results: Mean knowledge scores significantly increased in provincial schools’ Grades 4 and 6. In Metro Manila schools, knowledge scores generally increased. Dietary intake for calcium significantly increased at endline (p=0.026). Majority of children were less active in KK 1 and KK2 intervention. The percentage point difference among less active children in KKII was significantly higher compared to KK1 (p=0.01). The change in weight-for-age z-score was significantly higher in the KKII intervention compared to KK1. Children from private schools had higher change in BMI especially during KKII intervention. Fitness scores significantly improved for push up and trunk lift.

Conclusions: Over-all, significant gain in knowledge was evident in the children at the end of KKII. There was a greater improvement in nutrient intake in pre-post measures in KK1 than KKII, although the adequacy of intake was still below the recommendations. Z scores for weight-for-age and BMI improved particularly among children from the public schools. Majority of children were less active with the proportion of less active children increased at the end of KKII. Fitness scores generally improved.
Associations among sleep and various health behaviours of grade seven students

Authors: Sarah Woodruff, Katherine Fryer, Ty Campbell, Mary Cole, Ashley Kirby

Purpose: To examine the associations among sleep, various food and sedentary behaviours, and body weight status of grade seven students.

Methods: The web-based Food Behaviour Questionnaire was administered to a cross-section of schools (N=1068, 26 schools). Body mass index (BMI) was measured objectively and sleep was determined by usual bed/rise times on weekdays and weekends and recorded as >8 hours vs. <8 hours. Exploratory analyses were conducted with continuous variables (Healthy Eating Index (HEI-C), servings of Vegetables/Fruit (VF), sedentary time (SED)) and categorical variables (gender, ethnicity, BMI, family meal frequency (FMF), breakfast frequency). An ordinal logistic regression (OLR), including all variables, determined the overall impact on sleep.

Results: Greater than 8 hours of sleep was associated with females (X^2=6.726, p=0.035) and non-White ethnicity (X^2=7.597, p=0.022), higher diet quality (HEI-C=68.26 vs. 64.36, p=0.05), more VF (2.6 vs. 3.4, p=0.007), higher FMF (X^2=12.073, p=0.017), regular breakfast consumption (vs. never/rarely; X^2=35.699, p<0.001), and less SED (5.1 hours vs. 8.2, p<0.001). No differences in sleep were found for BMI status. The OLR revealed that participants were less likely to sleep >8h if their diet quality was rated as needs improvement (vs. good: OR=0.54, p=0.010), whereas participants were more likely to sleep >8h if they never/rarely consumed breakfast (vs. everyday: OR=1.12, p=0.001), were non-White (vs. White: OR=1.43, p=0.030), and participated in more sedentary activities (vs. less: OR=1.12, p<0.001).

Conclusions: While sleep was not necessarily associated with BMI status, the associations with diet quality, ethnicity, breakfast consumption, and sedentary behaviours suggest that sleep may be an important health promotion strategy.
3-7 hours of nutrition education per year. Is that enough? How much is needed?

Authors: Steven H Kelder

Purpose: Nutrition education is considered an essential ingredient to improve the nutritional quality of foods that children consume. Given that schools have limited instruction time, a valid question is “How much time should schools devote to nutrition education.”

Methods: A literature review was conducted in 2011 to answer 3 questions: 1. How much school time is devoted to nutrition education? 2. How much time is recommended by professional guidelines or evidence-based programs? 3. How much time are children exposed to unhealthy food advertisements?

Results: The 2006-07 CDC’s SHPP study revealed 57% of schools required some form of nutrition education, yet the median hours per year was only between 3.4-6.9 hours. Professional guidelines recommend 50 hours of nutrition education per year are necessary for behavior change. Controlled nutrition education intervention trials have produced behavior change with 15-35 hours of intervention per year. The Institute of Medicine estimates children view as many as 7,600 “unhealthy” food ads per year, potentially resulting in 63 hours of advertising exposure per year.

Conclusions: Clearly American children do not receive enough nutrition education and too much unhealthy food advertisements. The US dietary guidelines suggest optimum qualities and quantities of foods to consume, but do not outline educational standards. The answer appears to be 15-50 hours per year. USDA should follow the lead of the US physical activity guidelines that clearly recommend 60 minutes of physical activity per day and between 150-225 minutes of physical education per week.
The Orphan Nutrition Project: Description of the anthropometric, nutrition and developmental condition of young children living in Kazakhstan Orphanages.

Authors: Mary Hearst, John H Himes, Mishelle Rudzinski, Jeff Erlich, Saida Kereyeva, Aigul Syzdykova

Purpose: The purpose of this analysis is to describe the nutritional and developmental status of young children living in baby houses (orphanages) in Kazakhstan as part of the Orphan Nutrition Project.

Methods: Over a six month period in 2009/2010, 308 children under the age of three living in 8 baby houses were measured by trained staff for height/length and weight. The Bayley Scales of Infant Development were used by trained staff to assess mental and motor development. Blood was collected on a subsample of children to assess key nutritional factors. The World Health Organization growth charts were used to calculate z-scores. Cut points for wasting, underweight, stunting, development and biomarkers used established guidelines.

Results: 286 children had complete data on z-scores. Of these, 22.1% were experience wasting, 31.5% underweight and 36.7% stunting. The nutritional status of the children, based on blood biomarkers revealed that one-third of the children were anemic, 25% had low ferritin, 21.4% low albumin, 38% low vitamin D and 5.5% were iodine deficient. Only 2% had low serum zinc. Developmentally, 51.8% had mild to significant mental delays and 48.3% experienced mild or significant motor delays.

Conclusions: The children living at these baby houses in Kazakhstan have substantial nutritional deficits and developmental delays. Focused attention is needed to provide a nutritionally enhanced diet and improved developmental opportunities to improve the long term outcomes for these children.
Educational Handouts for Binge Eating Disorder, Boredom Eating, Emotional Eating, and Night Eating Syndrome in Pediatric Populations

Authors: Glenn R Mesman, Sarah A Wildermuth, Wendy L Ward

**Purpose:** Health care professionals are frequently called upon to treat maladaptive eating patterns in pediatric populations, but they may not know how to share specific symptoms or treatment recommendations in a succinct manner that is easily understood by patients and their families. Therefore, four educational handouts were designed to help providers disseminate information to youth and their families regarding binge eating disorder, boredom eating, emotional eating, and night eating syndrome.

**Methods:** Four educational handouts were developed through literature review and expert consensus for providers to give to parents as an aid for identifying whether their child may be at risk for the specific eating problem, understanding symptoms of each eating pattern, developing treatment goals for each disorder, and learning specific methods to help reduce the maladaptive eating pattern. The handouts are easy to understand and comprehensive in scope, yet brief.

**Results:** These handouts are designed to be used by in various medical or mental health settings by a variety of health care providers. They are not intended to replace appropriate health care and follow-up but to be used by the practitioner as an educational tool to aid in prevention or intervention efforts. They are free for use for educational purposes, with permission from the authors.

**Conclusions:** Educational handouts can be a helpful adjunct to prevention efforts and clinical intervention with youth with various maladaptive eating patterns, including binge eating disorder, boredom eating, emotional eating, and night eating syndrome.
Spanish Educational Handouts for Binge Eating Disorder, Boredom Eating, Emotional Eating and Night Eating Syndrome in Pediatric Populations

Authors: Joseph M Magness, Glenn R Mesman, Wendy Ward-Begnoche

Purpose: Given the increasing frequency of obesity and related maladaptive eating patterns in pediatric populations, healthcare professionals must find ways to treat these affected individuals from underserved populations. This is particularly important when important health-related information needs to be conveyed, and there are language barriers. These handouts were initially designed to aid physicians in advising youth with the following maladaptive eating problems: binge eating, boredom eating, emotional eating, and night eating patterns. However, a significant number of Hispanic-speaking patients were unable to benefit from them. Therefore, a translation and review for cultural appropriateness was undertaken.

Methods: The original English handouts were created to aid patients/parents in identifying risks for the specific eating problems, understanding the symptoms, and learning specific methods for reducing the maladaptive eating behaviors. They were translated into Spanish and reviewed in terms of being appropriate to the Hispanic culture. The handouts are easily understood and comprehensive in scope yet brief.

Results: The handouts are intended for use in a variety of medical or counseling settings. They are not designed to replace appropriate health care, but rather as an aid in prevention or intervention efforts. They are free for use in educational purposes, with permission from the authors.

Conclusions: As educational aids, these handouts can be a helpful addition in prevention efforts and clinical interventions with children/adolescents with these various eating problems. The Spanish translation offers a unique opportunity to improve health-related communication and reduce health disparities.
Correlates of fruit and vegetable eating behavior in Chinese children and adolescents

Authors: XU XIAOCUI, Liubai Li

Purpose: To analyze correlates of fruit and vegetable eating behavior in Chinese children and adolescents.

Methods: Using a randomized clustered sampling method, 3165 students in grades 4 to 12 were selected from urban and rural areas of Beijing, Liaoning and Guizhou provinces. A structured self-filling questionnaire was used for collecting data on personal, psycho-social and environmental correlates.

Results: 24.2% and 44.1% of students met the fruit and vegetable intake recommendations (2 times or more/day), respectively. Independent correlates of fruit eating included male gender (OR:1.699,95%CI:1.298-2.226,P<0.001), higher grade/age (OR:0.726,95%CI:0.610-0.865,P<0.001), unaware of recommendation on fruit intake (OR:4.156,95%CI:3.170-5.447,P<0.001), lower self-efficacy for eating fruits (OR:2.046,95%CI:1.744-2.401,P=0.001), lack of help from parents (OR:1.230,95%CI:1.098-1.378,P<0.001), lack of family allowing rule (OR:1.161,95%CI:1.013-1.330,P<0.001), and fruit unavailability at home (OR:1.506,95%CI:1.196-1.896,P=0.001). The independent correlates of vegetable eating included: male gender (OR:1.315,95%CI:1.112-1.556,P=0.001), lower grade/age (OR:1.187,95%CI:1.068-1.319,P=0.002), lower self-efficacy for eating vegetables (OR:1.325,95%CI:1.215-1.444,P<0.001), unaware of recommendation on vegetable intake (OR:2.361,95%CI:1.975-2.822,P<0.001), unavailability of home vegetables (OR:1.181,95%CI:1.076-1.259,P<0.001), and a lower education level of mother (OR:1.117,95%CI:1.044-1.195,P=0.001).

Conclusions: Fruit and vegetable eating behaviors correlated to personal, psycho-social and nutritional environmental correlates.
**NUTRITION AND PHYSICAL ACTIVITY: CHILDREN**

**P-071**

**The association of vegetarianism with BMI, diet and activity behaviors among adolescents in Delhi, India**

Authors: Nalini Ranjit, Melissa H Stigler, Cheryl L Perry, Monika Arora

**Purpose**: To describe the prevalence of vegetarianism among school-going adolescents in Delhi, India, and to examine the association of vegetarianism with BMI, and with dietary and activity behaviors, among these youth

**Methods**: Survey data and anthropometric measures for these analyses were obtained from 1818 students enrolled in the 8th and 10th grades of 8 schools (4 private schools with mostly middle and high SES students, and 4 government schools with primarily low SES students) in Delhi, India. Survey data included items on usual consumption of various dietary items, amount of physical activity, and meal practices. Mixed-effects regression models adjusted for grade, sex, school type, and accounting for school-level clustering were used to assess the association of vegetarianism with multiple dietary and activity behaviors.

**Results**: 57% of students were identified as vegetarian, based on self-reports of non-consumption of chicken, meat, fish and other seafood. Although the prevalence of obesity was comparable across vegetarians (15.6%) and non-vegetarians (16.1%), there were differences in both eating practices and activity behaviors. Vegetarians were significantly less likely to eat at restaurants (p<.003) or consume sodas or snacks (p<.001). They also spent significantly less time in sedentary activities such as watching TV or on a computer (p<.001 in each case). Levels of vigorous and moderate physical activity and sports participation were comparable across vegetarians and non-vegetarians.

**Conclusions**: Although vegetarianism in India is largely for religious reasons rather than health reasons, vegetarian adolescents engage in overall healthier lifestyles.
Mother and child achievement goals influence on young female swimmer eating style

Authors: Amy L Frith, Miranda Kaye, Justine Vosloo

**Purpose**: While eating disorders among young female athletes has been studied, the combined influence of parents and children on child eating styles among this population is not known. This study aims to determine the combined influence of mother and youth swimmer competition motivation on youth eating styles.

**Methods**: Participants were 20 pairs of female competitive youth swimmers, 8 to 17 years of age (Mage = 12.45; SD = 2.70) and their mothers (Mage = 46.36; SD = 4.92). Three parent-child dyads were dropped due to missing data from one member of the dyad. Mastery-approach achievement (MAp) goals were assessed with 3-items from the 12-item 2 × 2 Achievement Goals Questionnaire for Sport (AGQ-S). Eating styles were measured using the Dutch Eating Behavior Questionnaire- Child (DEBQ-C; 20 items) and Emotional Eating Scale-Child (EES-C; 26 items). We used Actor Partner Independence Models (APIM) in AMOS 18 to examine if the eating style of the youth swimmers were influenced by their mother (partner) or themselves (actor).

**Results**: Swimmers age was associated with increases in their DEBQ-C (r = .62, p < .01) and EES-C (r = .53, p < .05) scores. In each of the APIMs, only mothers goals had a negative effect on swimmers DEBQ-C scores (β = 0.56, p < 0.01; R² = .32) and on swimmers EES-C scores (β = 0.60, p < 0.01; R² = .41).

**Conclusions**: Together these results indicate that mothers espousing adaptive achievement goals more strongly influence their child’s healthy eating styles than the children’s own goals.
A physical activity, nutrition and motivation program in overweight children with intellectual disabilities

Authors: Erica A Hinckson, Annette Dickinson, Tineke Water, Madeline Sands, Lara Penman

Purpose: In children with disability, the risk of obesity is higher and is associated with lower levels of physical activity, inappropriate eating behaviors, and chronic health conditions. The aim of this study was twofold: i) to determine the effectiveness of a modified, commercially available licensed program in managing weight, and ii) to evaluate the sustainability of change in physical activity and nutrition behaviors in overweight New Zealand children with intellectual disabilities.

Methods: Twenty-two children 14 ± 4 y (mean ± SD) and their families participated in the study. The 10-week program consisted of 20 sessions focusing on physical activity, nutrition and motivation. Changes were measured immediately after completion of the program (post 1) and at 24 weeks (follow up). Children’s fitness was assessed with the six-minute-walk test (6MWT) and body fatness via waist circumference and BMI. Physical activity and nutrition changes were measured by means of proxy reporting and focus groups with parents. Individual interviews were conducted with school teachers and program leaders.

Results: Meters walked in the 6MWT at baseline, post 1 and follow up were 363 ± 148, 428 ± 124 and 420 ± 113 meters (mean ± SD) respectively. Differences in mean 6MWT between measurement points were trivial. There were trivial increases in waist circumferences post 1, 0.8; 90% CL (± 2.5) and follow up, 0.6; (± 2.5). Parents’ proxy reporting for weekly physical education, walking, swimming and active play provided unclear results. A small reduction was observed in weekly screen time -0.4; (± 5.7) post 1, but by follow up there was a small increase 4.5; (± 8.6). Both effects were unclear. A substantial reduction was observed in the consumption of confectionery and chocolates at the two measurement points. Qualitative data indicated that children had improved physical health with a reduction in hospitalizations and absences from school related to illness. The program assisted in the development of a supportive community network and children’s abilities to participate in family and community activities.

Conclusions: A weight management program tailored to the needs of children with intellectual disability has the potential to result in sustainable improvements in physical activity, nutrition and general health and wellbeing.
High obesity rates among Hispanic children living in an urban Milwaukee, WI community are associated with dietary intake, fitness level and risk for diabetes.

Authors: Margarita Santiago, Tara L LaRowe, JEFFREY S SLEDGE, Angelica Delgado Rendon, Magdalisse Gonzalez, Aaron L Carrel, Dale A Schoeller, Alexandra K Adams

Purpose: One third of US children are overweight or obese and the burden is even greater for Hispanic children at 41.8%. The objective of this study was to examine the diet, fitness level, risk for diabetes and their association with overweight and obesity among children in a Hispanic community.

Methods: In Fall 2010, a validated food frequency questionnaire was administered to 188 children (aged 10-14 years). Physical measures of height and weight, fitness level assessed by a 20-minute shuttle run (PACER) and fasting blood samples for glucose and were insulin obtained. CDC growth charts were used for the definition of childhood obesity. Differences in fitness level (PACER score), fasting blood glucose/insulin (HOMA-IR) and diet were examined by sex and BMI percentile categories.

Results: The prevalence of overweight and obesity was of 52.5%. Low fitness level and HOMA-IR were significantly associated among the overweight and obese (P<0.0001). Reported intake of sugary beverages was significantly higher in overweight and obese children. Further analysis by sex revealed a higher consumption of carbohydrates, sugar, and sugary beverages in overweight and obese boys (P<0.05).

Conclusions: Children in this community demonstrated higher obesity rates for their age than national rates for Hispanic children. Low fitness level, and high intake of sugary beverages were identified as significant correlates of childhood overweight and obesity. Interventions targeting these risk factors could have an effect on the high prevalence of childhood overweight and obesity and elevated HOMA-IR in this community.
Process Evaluation of the Youth Active and Media Savvy (YAMS) Pilot Camp

Authors: Veronica J Oates, Rita J Fleming, Amber J Franklin, Melvin J Williams, Enefiok J Ekanem

**Purpose:** Combating the potentially harmful influences of sophisticated marketing campaigns designed to increase purchases are the focus of the Youth Active and Media Savvy intervention. We hypothesize that raising awareness and appreciation of the African and African-American experience, in conjunction with a curriculum that emphasizes media literacy as well as nutrition and physical activity, will mediate healthy lifestyle behaviors and counteract the harmful effects of media for African American youth at risk for obesity.

**Methods:** YAMS intervention uses the PEN-3 cultural health framework, community-based participatory research methods, and an adaptive design. A one-week pilot camp with 9 youth ages 12 – 15 years was held to determine the cultural appropriateness of an existing media literacy curriculum and explore culturally acceptable methods to counteract negative media influences, unhealthy dietary behaviors, and sedentary lifestyles. Findings from the process evaluation of the camp are presented.

**Results:** Evaluating the process of conducting the camp as a pilot allowed the researchers and youth to thoroughly assess surveys, curriculum, and other camp components. Key process evaluation components of implementation, recruitment, capacity, barriers, and oversights are discussed. Negative outcomes include a general impression that the program “felt like school.”

**Conclusions:** Conducting process evaluations of pilot community-based interventions provides the opportunity for investigators to determine important elements that mediate learning and behavior change, and uncover potential barriers to fidelity.
Dietary behaviour, physical activity and obesity among adolescents attending a day-boarding school in Delhi

Authors: Anita Malhotra, Anjali Garg

Purpose: This study investigated the contribution of dietary behaviour and physical activity to the body mass index (BMI) of adolescents attending an affluent day-boarding school in Delhi.

Methods: Subjects (N=277), aged 11 to 14 years, attending grades VI, VII and VIII were selected from a purposively identified day-boarding school in north Delhi; their height and weight were measured to compute ‘BMI for age’. Of these, 96 subjects were randomly selected to gather data about dietary behaviour and physical activity through a questionnaire and multivariate regression was employed for analysis.

Results: The prevalence of overweight was 11.9% and 14.9% among the boys and girls respectively, while 17.6% and 21.1% were found to be obese as per WHO reference data. One-third (33.3%) of the subjects ate out 2-3 times a week; their choices were influenced by marketing gimmicks such as advertisements (82.3%) as well as free toys (61.4%); and 66.6% succeeded in pestering their parents. Frequent consumption of junk food and occasional consumption of fruits and vegetables was reported. Majority had snacks in front of TV (54.2%) and consumed dinner as the major meal (90.6%). Nearly 75% spent 1-2 hours daily on computer or watching TV. 13.5% reported family history of obesity. Heredity, dietary practices and physical activity contributed to three fourth of variation in BMI (R²=0.76, p<0.01).

Conclusions: Multiple strategies including awareness generation, school health programmes and regulation of junk food marketing are needed to address the emerging problem of adolescent obesity.
The association between sports participation and dietary behaviors among Texas 4th grade children

Authors: Katherine Skala, Jennifer L. Gay, Andrew E Springer, Harold W Kohl III, Shreela V Sharma, Rebecca Martin, Deanna M Hoelscher

Purpose: Sports team participation is congruent with teaching and supporting healthy eating yet limited research has examined the association between sports participation and dietary behaviors. This study aims to determine the association between youth sports participation and dietary behaviors among elementary-aged children.

Methods: Dietary behaviors and sports team participation were measured using validated, self-reported measures among 5,035 Texas 4th grade students (51% boys) from the cross-sectional 2009-2011 School Physical Activity and Nutrition study. Multiple logistic regression was used to assess the association between each food item, with consumption (eaten at least once) on the previous day and number of sports teams as the independent class variable (0,1,2,=3) adjusting for BMI, physical activity, socio-economic status, and ethnicity.

Results: Significant dose-response associations were seen between number of sports teams and consumption of most fruits and vegetables. The likelihood of eating fruit for boys increased with the number of sports teams (1 team: OR=1.89; 3 teams: OR=3.44, p<0.001) and the likelihood of consuming green vegetables for girls was higher with the number of sports teams (1 team: OR=1.50; 3 teams: OR=2.39; p<0.001). For boys, the odds of consuming fruit-flavored drinks was higher (p=0.019) and the odds of drinking soda was lower (p=0.018) with the number of sports team whereas for girls, sports participation was directly associated with diet soda consumption (p=0.006).

Conclusions: Participation in sports teams is associated with dietary intake patterns consistent with health. Since sports are offered internationally throughout the lifespan, they should be considered an important target for health promotion.
U.S. regional differences in adolescent BMI percentile and obesity-related behaviors

Authors: Leah Lipsky, Ronald J Iannotti

Purpose: The objective of this study was to examine U.S. regional differences in BMI percentile (BMI%ile) and obesity-related behaviors, and to evaluate to what extent regional differences in BMI%ile were explained by behavioral differences.

Methods: Data come from a representative sample of U.S. adolescents (n=2524, 55% female) participating in an observational cohort study (2010 NEXT Generation Health Study). Subjects answered questions on diet (breakfast, fast food, fruit, fruit juice, vegetables, soda, milk), physical activity (vigorous physical activity), sedentary behavior (television and computer use, eating while watching TV, TV in the bedroom), and sociodemographics (age, sex, family affluence, race/ethnicity); age- and sex-adjusted BMI%ile was calculated from measured height and weight. Linear regression was used to examine bivariate relationships of region (Northeast, South, Midwest, West) and BMI%ile with behavioral and sociodemographic variables, and to evaluate the relationship of BMI%ile to region with and without adjusting for behavioral and sociodemographic covariates.

Results: We found significant regional differences in BMI%ile, race/ethnicity, fast food, salad, carrots, soda, TV use, eating while watching TV and TV in the bedroom, and significant associations of BMI%ile with TV use, eating while watching TV, race/ethnicity and family affluence. BMI%ile was not related to dietary behaviors or physical activity. Associations of BMI%ile with regional, behavioral and sociodemographic variables except race/ethnicity remained independently significant in multiple regression.

Conclusions: Regional differences in sociodemographic and behavioral variables did not account for regional differences in BMI%ile, suggesting the importance of unobserved factors or the need for more precise data collection methods.
OCCUPATIONAL HEALTH

P-079

Contribution of Occupation to High Doses of Light-Intensity Activity among Mexican American Adults

Authors: Jennifer L. Gay, Harold W Kohl III, Grace Trevarthen, Jennifer J Salinas, Joseph B McCormick, Susan P Fisher-Hoch

Purpose: Determine the contribution of accelerometer-measured occupational-related light-intensity activity among Mexican American adults, and test associations with cardiovascular risk factors.

Methods: Cross-sectional physical activity and biological data from 118 Cameron County Hispanic Cohort Mexican American adults (68.6% female) were analyzed. Self-reported occupations were matched to activities from the 2011 Compendium of Physical Activities and assigned corresponding MET values. A one way ANOVA was conducted to test the relation between occupation and physical activity behavior. Participants were classified as At-Risk based on established cut points for BMI, fasting blood glucose, triglycerides, HDL, blood pressure, waist circumference, and body fat percentage. Chi-square tests were conducted to assess the association between occupational activity classification with these risk factors.

Results: Participants engaged in >5 hours of light-intensity activity on average, and those in sedentary occupations engaged in fewer light-intensity activity minutes than those in low-active or moderately-active occupations (p<0.001), but no differences were found for sedentary time or vigorous or moderate-intensity physical activity. Occupation explained 14% of the variation in light-intensity activity (p<0.001). Only differences in %body fat were found in comparisons of occupational activity with cardiovascular disease risk factors, such that those in moderately-active occupations had higher %body fat.

Conclusions: Adults in moderately-active occupations may engage in more constant activity during the day, but additional domains of activity also contribute to total activity minutes. Understanding the mechanisms through which light-intensity activity may reduce the risk of chronic disease will contribute to improved interventions as light-intensity activity participation may be more feasible than meeting current physical activity guidelines.
Evidence Informed Workplace Policy Interventions: Promoting Physical Activity and Healthy Eating

Authors: Kenneth R Allison, John J Dwyer, Heather E Manson, Melody LA Roberts, Mary Fodor O’Brien, Jennifer Robertson, Ann L MacGillivray, Shelley L Hawrychuk

Purpose: A synthesis of evidence regarding the effectiveness of workplace interventions on adult physical activity, healthy eating, and BMI was conducted. Results of this synthesis and evidence from additional sources informed recommendations to the Ontario government regarding workplace physical activity and nutrition policies. An update on government and stakeholder responses to these recommendations will be presented.

Methods: The literature review and synthesis included the years 2005-2010 and focused on primary prevention workplace interventions containing a policy/environmental component. The search strategy and eligibility criteria yielded 43 original articles for the review. In a subsequent project jointly sponsored by Public Health Ontario and Cancer Care Ontario, recommendations for policy interventions were selected based on eligibility criteria. Two recommendations dealing with workplace physical activity and healthy eating were developed and will be included in a report submitted to the government of Ontario in March, 2012.

Results: Based on the synthesis of literature, strategies associated with positive increases in physical activity outcomes included: prompts to encourage employees to use stairs, use of pedometers, and some support for workplace advisory committees. Strategies associated with positive changes in eating behavior included: providing healthier foods in work settings, interventions that include an educational component, and interventions having workplace advisory committees. Subsequent reviews conducted also emphasize the contribution of workplace health programs to benefits to the employer, including lower cost, improved morale, and increased productivity.

Conclusions: The evidence supports recommendations for the Ontario government, an employer of over 67,000 employees, to provide leadership in adopting workplace physical activity and nutrition policy initiatives.
Secondary Eating and Occupational Activity Among Latina Mothers in the United States--Evidence from the American Time Use Survey.

Authors: Sarah Sliwa, Aviva Must, Flavia C Perea, Christina D Economos

**Purpose**: To understand the relationship between occupational activity (OA), time spent secondary eating (eating concurrent with other activities) and weight status among employed native and foreign-born Latina mothers (ages 18-55) in the US with at least one child <13 years old (n=629).

**Methods**: The Eating and Health Module of the American Time Use Survey (2006-2008) includes secondary eating and weight status (BMI>30=obesity). Metabolic Equivalent Values (METs) were assigned to the detailed ATUS occupational classification codes and classified as sedentary (<2 METs), light (2-2.9 METs), moderate (3-6 METs), vigorous (>6 METs). Ordinary Least Squares models tested the relationships between OA and weight status and time in secondary eating (log transformed), adjusting for socioeconomic, household, and acculturation-related covariates.

**Results**: Light intensity jobs were most common (45.7%), followed by moderate (28.2%) and sedentary (26.0%). Those with vigorous OA were omitted (0.1%, n=3). Across OA, 48.4% of those in sedentary, 57.9% in light, and 32.6% in moderate activity jobs engaged in secondary eating (Chi-square test p=.0001). Compared to women with sedentary occupations, women with light intensity occupations spent a median 1.5x more minutes in secondary eating (CI 1.01, 2.32). Higher levels of education, being US-born, and having a child <6 years old was associated with minutes of secondary eating (p<.05). Weight status and secondary eating were not related.

**Conclusions**: Consistent with previous research, secondary eating was associated with higher levels of education and with being born in a “western” culture. Light intensity jobs were associated with increased secondary eating. Long-term health implications are unclear.
**Biometric Cardiovascular Disease Risk Factors and Workplace Productivity Loss**

Authors: Raquel F Pereira, Jeffrey J VanWormer, Jackie Boucher, Heather R Britt, James M Peacock

**Purpose:** Evaluate the association between workplace productivity and levels of biometric risks.

**Methods:** Data from 2,912 fasted adults age 18-86 years (with ≥0.40 FTE) without self-reported diabetes or heart disease, and who underwent a CHD risk screening. Workplace productivity loss, the outcome, was created by combining absenteeism and presenteeism from the Work Productivity and Activity Impairment questionnaire. Predictors included: systolic and diastolic blood pressure, total, HDL, and LDL cholesterol, triglycerides, c-reactive protein (CRP), blood glucose, and glomerular filtration rate. Multiple linear regression analyses were conducted to identify significant predictors (p<0.05)(age and sex kept in all models).

**Results:** After adjustment for age and sex, only CRP was retained as a significant predictor of workplace productivity loss. Least squares adjusted mean±SE productivity loss was 7.3±1.1% for CRP >10.0 (mg/L), 6.0±0.5% for CRP 3.1-10.0, 4.9±0.4% for CRP 1.0-3.0, and 4.4±0.4% for CRP <1.0 (p for trend <0.001). Post hoc comparisons revealed that workplace productivity loss for participants with CRP >10.0 was significantly greater than other CRP categories, except CRP 3.1-10.0, and participants with CRP 3.1-10.0 had significantly greater productivity loss relative to those with CRP <1.0.

**Conclusions:** Relative to optimal CRP <1.0, CRP >3.0 is associated with less productivity. At high levels, this may be reflective mainly of CRP’s sensitivity to acute flu. CRP may also stand as a marker of other risks (e.g., obese, sedentary) that have a more direct impact on productivity loss. More research is needed to examine the degree to which CRP consistently stands out as independent predictor of workplace productivity.
**Review of Measures of Worksite Environment and Policy Supports for Physical Activity and Healthy Eating**

**Authors:** Christine M. Hoehner, Margaret A. van Bakergem, Christine M. Marx, Ross C. Brownson

**Purpose:** Worksite environmental and policy supports for physical activity (PA) and healthy eating (HE) represent promising strategies for addressing obesity. This review assessed the state of science concerning available measures of worksite environment and policy supports for obesity prevention.

**Methods:** Multiple databases were searched for instruments used to assess environment and policy supports for PA and HE published in 1991-2011. Instruments were included if published in peer-reviewed publications that discussed their development and/or utilization. In addition, two commonly-cited instruments developed by state public health departments were included. Administration mode and measurement properties were documented. Items were classified into five domains (promotions and programs; organization; internal physical environment; internal social environment; external environment) and sub-domains.

**Results:** Fifteen instruments met inclusion criteria. Six were employee surveys, five were manager surveys, one was an observational assessment, and three combined administration modes. Eleven instruments underwent reliability testing. Instruments varied in number of items (range, 9-283). Among all items 41 percent related to PA and 24 percent related to HE. Most instruments (n=11) did not contain items in the Internal Social Environment domain; however, the majority of instruments included items within the PA sub-domains related to exercise facilities and lockers/showers and the HE sub-domain related to healthy options/vending.

**Conclusions:** This review highlights gaps in measurement of the worksite social environment. The findings provide a useful resource for researchers and practitioners about options for assessing worksite environments and should inform future development of new or modified instruments for promoting energy balance.
PHYSICAL ACTIVITY ENVIRONMENT

P-084

Deprivation Amplification in Kansas City, Missouri: Exploring Differences in Park Quantity and Quality by Income and Race

Authors: Andrew Kaczynski, Sonja Wilhelm Stanis, Ryan Bergstrom, Gina Besenyi, Katie M Heinrich, Katherine Vaughan

Purpose: Parks are key community assets for promoting physical activity, but some evidence suggests these integral resources are not equitably distributed and few studies have examined the actual quality of parks. The purpose of this study was to examine disparities by income and race/ethnicity in the availability and quality of parks across Kansas City, Missouri (KCMO).

Methods: Data from the U.S. Census Bureau’s American Community Survey were used to designate all census tracts (CTs) (n=174) as low, medium, or high income and percent minority. All parks in KCMO were mapped using GIS. Park availability was measured as the number of parks intersecting the CT. Park quality was measured by the average number of quality concerns (e.g., graffiti) and aesthetic features (e.g., landscaping) per park in the tract. MANCOVA was used to analyze differences in park availability and quality across tract income and race/ethnicity tertiles.

Results: Low income CTs contained significantly more parks (M=1.46) than medium (M=1.25) or high (M=1.00) income CTs. There were a greater number of quality concerns per park in low income CTs (M=0.75, SD=0.89) than high (M=0.42, SD=0.57) or medium (M=0.50, SD=0.56) income CTs. Finally, there were more aesthetic features per park in medium income (M=3.02, SD=1.57) than high income CTs (M=2.29, SD=1.31).

Conclusions: Park availability was greater in low income areas, but overall park quality was poorer in parks in low CTs then medium or high CTs (more quality concerns and fewer aesthetic features). Future research should examine policies that contribute to and that might rectify such disparities.
Assessing Neighborhood Physical Characteristics using Google Street View

Authors: Stephen Mooney, Michael D.M. Bader, YeonJin Lee, Kathryn Neckerman, Julien O Teitler, Andrew G Rundle

Purpose: Analysis of neighborhood effects on physical activity requires neighborhood physical data collection, which can be costly. Audits using Google Street View were hypothesized to allow more efficient data collection than in-person audits.

Methods: A system was built for street rating using dual-monitor computers such that raters manipulated a Google Street View window on one screen while answering questions about that street on the other. 5 raters were recruited to assist with refinement of audit items taken from 4 pre-existing audit scales and to participate in a final test to judge overall inter-rater reliability. The final test set comprised 100 block faces from metropolitan areas with over 100,000 residents and 50 block faces from central cities of metropolitan areas with over 500,000 residents.

Results: After 9 tests to refine audit items (about 100 block faces total), a formal test of inter-rater reliability was begun on 150 block faces. Of the 20 block faces that all raters have rated to date, at least 80% agreement has been achieved on 85% of the final audit items (145 of 170). Kappa scores are more broadly distributed, in large part as a result of kappa’s sensitivity to disagreement in low-prevalence categories, but scores are above 0.60 for more than half the audit items (91 of 170).

Conclusions: Using Google Street View to implement neighborhood audits is a viable alternative to sending raters into neighborhoods in person.
Association between neighborhood perceptions and meeting the 2008 Physical Activity Guidelines for Americans in U.S. Adults

Authors: Kathryn Coakley, Kathleen B Watson, Dianna D Carroll, Janet E Fulton

**Purpose:** To describe U.S. adults’ perceptions of neighborhood environments and the association of their perceptions with meeting 2008 Physical Activity Guidelines for aerobic physical activity (PA).

**Methods:** Analysis is based on the 2009 HealthStyles mail-panel survey, a cross-sectional, national sample of 3,450 adults. Using a 4-point scale, respondents indicated their level of agreement (strongly disagree – strongly agree) with 13 statements concerning neighborhood characteristics, traffic safety, social and aesthetic features. Prevalence of respondents’ agreeable perception (combination of somewhat/strongly agree) was estimated for each feature. Logistic regression, adjusting for demographics and body mass index, was used to examine associations between each neighborhood perception and meeting aerobic PA Guidelines (?150 minutes/week of at least moderate-intensity PA).

**Results:** The prevalence of adults with agreeable perceptions for each characteristic were as follows: residential density (79.2%), crime safety (76.5%), amount of traffic (73.0%), crosswalks (66.1%), speed limit observance (62.9%), pedestrian infrastructure (57.5%), recreation facility availability (56.5%), interesting surroundings (55.0%), lighting (53.3%), seeing others being active (53.3%), access to transit (45.3%), bicycling infrastructure (41.3%), and land-use mix (33.2%). Ten of the 13 items had favorable perceptions ( > 50% agreement). Meeting aerobic PA Guidelines was significantly associated with bicycling infrastructure (OR=1.30; 95%CI:1.09,1.56), crosswalk availability (OR=1.24, 95%CI:1.00,1.54), seeing others being active (OR=1.25, 95%CI:1.01,1.57), and having interesting surroundings (OR=1.41, 95%CI:1.15,1.72).

**Conclusions:** Positive perceptions of neighborhood qualities supportive of PA are generally reported by U.S. adults. Bicycling infrastructure, crosswalk availability, seeing others being active, and having interesting surroundings are positively associated with meeting aerobic PA Guidelines, representing potential targets for PA interventions.
The Contribution of Parks to Physical Activity

Authors: Kelly R Evenson, Fang Wen, Daniel A Rodriguez, Deborah Cohen

**Purpose:** The aim of this study was to develop objective measures of park use and to describe patterns of park use and its association with moderate-to-vigorous physical activity (MVPA) among adults.

**Methods:** From five US states, 238 adults were enrolled in or near 31 study parks. Participants wore a global positioning system (GPS) monitor (Qstarz BT-Q1000X) and an ActiGraph (GT3X) accelerometer concurrently for three weeks. Parks were mapped from local and national park shape files. Using objective measures based on the accelerometer and spatial data, we determined park visits and whether park use was associated with MVPA on a daily basis.

**Results:** Participants included adults age 18-85 years, 56% female, 49% non-Hispanic White, 26% non-Hispanic Black, and 15% Hispanic. On average, participants lived a median of 0.7 miles from the closest park. They visited parks a median of 2.3 times/week (interquartile range (IQR) 1.0, 4.7), with 40 minutes/day for the median park visit duration (IQR 19, 68). Overall, participants engaged in a median of 23 minutes/day of MVPA (IQR 13, 37). Of the total, an average of 8% of moderate activity and 9% of vigorous activity was completed while in parks; on average 35% of MVPA occurred on the days when they went to a park. Mean and median MVPA and time spent in MVPA bouts were higher on days when parks were visited compared to days when they were not visited (p<0.0001).

**Conclusions:** Using objective measures, we found that 8% of all MVPA occurred in parks among this sample of adults.
Parental Neighborhood Safety Perceptions and Children’s Health Behaviors: Variations by Age, Gender, and Household Income

Authors: Tracy A Westley, Andrew Kaczynski, Sonja Wilhelm Stanis, Gina Besenyi

Purpose: Purpose: Parents’ perceptions of environmental factors may strongly influence youths’ active and sedentary behaviors. However, few studies have investigated such associations, let alone several behaviors simultaneously or differences by child characteristics. This study examined how parental neighborhood safety perceptions (NSP) are related to physical activity (PA), active commuting to school (AC), park use (PU), active transportation to parks (ATP), and sedentary behavior (SB), and how such relationships vary by child gender, age, and household income.

Methods: Methods: Data for 144 children were obtained from a survey of randomly-selected households across Kansas City, Missouri. Parents completed validated measures about NSP (7 items, alpha=0.90) and one child’s PA, AC, PU, ATP, and SB. Children were dichotomized into high/low groups for each behavior. ANCOVAs examined differences in parents’ NSP between each pair of high/low behavior groups for the full sample, for male and female youth, and for three age groups and three household income groups.

Results: Results: There were no significant differences in parental NSP between the high/low groups for PA or AC. However, parents of children who used parks reported higher NSP for the full sample (F=9.50,p<0.001), and among male (F=7.60,p=0.01), 3-5 year old (F=7.92,p=0.01), 13-17 year old (F=4.57,p=0.04), and low-income children (F=5.30,p=0.03). Parents of female youth with higher ATP (F=4.59,p=.04) and of female and 3-5 year old children with lower SB (Ffemale=4.86,p=0.03; F3-5years=6.70,p=0.02) also had higher safety perceptions.

Conclusions: Conclusion: Given parents’ influence over children’s behavior, addressing structural and psychosocial elements of neighborhood safety can lead to increased physical and social activity among youth.
Recreational Physical Activity in New York City is Associated with Access to Parks and Graffiti in Parks

Authors: Andrew G Rundle, Kathryn Neckerman, Ofira Schwartz-Soicher, James Quinn, Gina Lovasi, Christopher Weiss, Kevin Konty, Bonnie Kerker

**Purpose**: To determine whether access to parks, and graffiti in parks, were associated with physical activity.

**Methods**: Pooled data (n=38,963) from 2002-2005 from the New York City (NYC) Community Health Survey, an annual telephone survey of NYC residents, were linked via residential Zip code to geospatial data describing NYC. Respondents reported whether they had engaged in any recreational physical activity in the past month. The Department of Parks and Recreation provided data on park boundaries and the results of cleanliness inspections. A scale measuring the percentage of inspections for graffiti failed by the park, weighted by the area of the park, was created. Multilevel logistic regression models were used to test whether engagement in physical activity was associated with the percent of the Zip code covered by large (>6 acres) and small parks (=6 acres) and with graffiti in parks. Analyses controlled for individual-level socio-demographic characteristics and Zip-code level poverty, homicide rate and neighborhood walkability.

**Results**: Overall, 71% of the respondents reported engaging in recreational physical activity. In multivariate analyses, engagement in recreational physical activity was positively associated with the percentage of Zip-code area covered by large park space (Odds Ratio (OR)=1.10 for the interquartile range (IQR) of park area, 95% CI=1.04-1.17), was inversely associated with graffiti in parks (OR=0.95 per IQR on the graffiti scale, 95% CI=0.91, 1.00) and was not associated with the percent of Zip-code covered by small parks.

**Conclusions**: The creation and maintenance of large parks spaces may be useful for promoting physical activity.
ENVIRONMENTAL CORRELATES TO PHYSICAL ACTIVITY IN ADOLESCENTS: Tracking leisure time activity patterns in 14 year-old children

Authors: Ingunn Dr. Fjørtoft, Owe Professor Löfman, Kine Professor Halvorsen Thorèn, Håvard Dr. Tveite, Renata PhD-student Aradi

Purpose: The research project aims to explore 14 years-old youngsters’ everyday physical activity behaviour and point out how the urban landscape contributes in it. This study focused on environmental facilitation of how environments promote physical activity in 9 graders in two different neighbourhood settings.

Methods: Neighbourhood facilities for PA were described and identified through ortophoto maps. The children’s movement patterns and activity levels were measured during the main school break and afternoon applying a GPS Garmin Forerunner 305 with combined heart rate monitoring. Data were then transferred to and structured in a Microsoft Access data base and further exported in dbf format to an attribute table in ArcInfo (ESRI). Spatial reference data were converted to a projected coordinate system and geocoded in ArcGIS using metric units. Ordinary statistics and graphs were calculated using SPSS, Axum and ArcGIS, including plug-in modules such as Hawth Tools, Spatial Analyst and Geostatistical Analyst.

Results: Typical movement patterns such as walking around the neighborhood were identified and sports arenas were typical determinant for PA in neighborhood settings. Generally, low activity levels (mean HR<120 bpm) were registered for both neighborhoods, but this varied individually.

Conclusions: GPS tracking and HR monitoring showed varied movement patterns of low PA levels during leisure time in two different neighborhood settings. Activity did not meet recommended daily time and levels of PA in children and youth. It was questioned if traditional sport facilities are the determinants that best promote physical activity in adolescents. The applied methodology seemed to be promising for further studies.
Using Google Earth Street View to assess street characteristics associated with walking behaviours.

Authors: Pippa Griew, Melvyn Hillsdon, Charles E Foster, Emma Coombes, Andy P Jones, Paul Wilkinson

Purpose: Walking for physical activity is associated with substantial health benefits for adults. Increasingly research has focused on associations between walking behaviours and neighbourhood environment variables such as street characteristics. Nevertheless, the objective assessment of street-level data is challenging. Google Earth street view provides a possible alternative to, costly, in-person street auditing. The aim of this research is to assess the reliability of using Google Earth street view for the objective measurement of street characteristics.

Methods: A modified version of the pedestrian environment review system (PERS), incorporating nine categories of street characteristics, was completed by three trained researchers during 2011. All auditors completed street-audits using both desk-based and in-person methods. Streets chosen for auditing (n=30) were selectively sampled from one large UK town to incorporate a range of land-use types. Street characteristics were rated as poor, fair or good. Criterion reliability was assessed by percentage agreement and Cohens’ kappa statistic.

Results: Agreement between desk-based and in-person audits was high across all street characteristic categories with results ranging from 75 to 97% agreement (average 84%) and the kappa co-efficient ranging from k=0.5 to 0.9 (average 0.6). Lowest agreement (75%, k=0.5) was reported for the way-finding category where street signage was occasionally obscured in computer images due to obstructions such as parked cars.

Conclusions: Google Earth street view was found to provide a reliable measurement tool for the objective assessment of street characteristics. It is recommended as a practical and cost-effective method that could substantially increase potential for large-scale objective data collection.
Mixed-methods analysis of dog-walking: Role of individual and environmental predictors

Authors: Kristin L Schneider, Stephenie C Lemon, Deirdra Murphy, Cynthia Ferrara, Clara Savage, Emily Panza, Brianne Bozella, Kimberly Gada

Purpose: Roughly 60% of dog owners do not achieve the recommended amount of weekly physical activity. The present study used a mixed methods approach to examine previously studied and novel predictors of dog walking.

Methods: Participants (N=60) from two comparable cities (n=31 from Worcester, n=29 from Lowell) completed self-report measures of dog walking and dog walking predictors, and then participated in a focus group where they discussed experiences with dog walking.

Results: Multiple regression analyses revealed that having positive attitudes about the mental health benefits of dog walking significantly predicted weekly dog walking minutes (t=1.98, p=.05, R^2=.05), while dog-specific motivators (e.g., dog enjoys walking) and environmental barriers to dog walking did not. Focus groups were content analyzed; results suggested that environmental factors impaired dog walking in Worcester more than Lowell. Thus, we examined whether city moderated the effect of environmental factors (i.e., dog litter related and availability of walking areas) on dog walking minutes. Multiple regression analyses revealed a marginally significant city x dog litter barrier interaction (t=1.78, p=.08, R^2=.05). Simple effect analyses revealed an association between dog litter barriers (e.g., lack of trash bins) and dog walking for Worcester (t=-2.76, p=.01, R^2=.17), but not for Lowell (p=.70). Though Worcester reported significantly fewer areas to walk than Lowell (p=.04), city did not moderate the relationship between availability of walking areas and dog walking, possibly due to low sample size.

Conclusions: While individual differences in dog walking may be ubiquitous, dog owners may be more influenced by environmental barriers in some communities.
Does child yard size and outside portable play equipment affect the time children spend outdoors?

Authors: Christina P McWilliams, Derek Hales, Stephanie Mazzucca, Dianne S Ward

**Purpose:** To explore factors related to the amount of time children ages 3-12 spend outdoors.

**Methods:** As part of a larger study to develop an assessment of the home food and physical activity environment, parents (n=129) reported the number of hours their children spent outdoors each week. In addition, trained research staff observed yard size and amount of portable play equipment visible in the yard on 6-point scales. We examined the relationship of yard size (coded as 3 levels), portable play equipment (coded as 2 levels), and outdoor time within 3 strata of age groups: 3-5 y, 6-9 y, and 10-13 y. Interactions between age and environment (yard size and portable play equipment) and outside play time were analyzed in SAS v9.2 (Cary NC).

**Results:** Results showed a gain of approximately 2 hours of weekly outdoor play time when comparing the smallest to largest yard size. Also, increased amounts of visible portable play equipment were associated with approximately 3 hours more of weekly outdoor play time. No significant association was found between age and yard size, and age and visible portable equipment. However, a positive relationship was seen with more visible portable play equipment associated with more outdoor play in all ages and the age groups 6 and older, outdoor play time increased as yard size increased.

**Conclusions:** Our findings indicate that portable play equipment and yard size are related to children’s outdoor play time at different ages and may be most important as children get older.
Does crossing the border make you fat?

Authors: Marisa Molina, Guadalupe X Ayala, Luz M Garcini

Purpose: To examine the relationship of border crossing and obesity related health behaviors among Latinos living on the U.S. side of the U.S.-Mexico border. Studies have examined differences in health behaviors between Latinos living in the U.S. vs. those living in Mexico; however few have explored the influence of border crossing on the adoption of obesity related health behaviors.

Methods: A cross-sectional, door-to-door survey was conducted between June and September of 2009. A multistage sampling method was used to select 397 Latinos between 18 and 89 living in South San Diego County to complete a face-to-face interview.

Results: Of the 397 individuals interviewed, the mean age was 43.6 years and 73% were female. Two-hundred and five participants (52%) reported having crossed the border at least once in the last month, 160 (80%) of whom reported crossing to visit family, friends, to sight-see, or to eat at a restaurant. Those who crossed for these reasons reported less physical activity then those who did not cross (2514.8 vs. 3354.1 METS), a higher percentage were obese (49.4% vs. 41.2%), were more likely to have had at least one alcoholic drink in the past month (20% vs. 14.4%) and to have eaten fast food in the past week (64.4% vs. 60.3%).

Conclusions: The potential influence of border crossing is an understudied phenomenon and may help to explain health disparities observed on the U.S.-Mexico border.
Physical Activity Options, Locations, and Transportation among Mexican-origin Children in Texas Border Colonias

Authors: M. Renée Umstattd Meyer, Megan S Patterson, Cindy L Salazar, Joseph R. Sharkey

Purpose: Burgeoning colonias communities, located along the U.S.-Mexico border, are characterized by disproportionately poor families of Mexican-origin, limited access to resources and health services, and heightened risk for obesity and diabetes. However, fewer children of Mexican-origin report engaging in physical activity (PA) levels associated with health benefits. Environmental influences of PA premised in ecological perspectives are well supported, although rarely examined among colonias children. Therefore the purpose of this study was to identify PA offerings, locations, and transportation characteristics of colonias children.

Methods: Face-to-face interviews were conducted in Spanish by promotora-researchers (native community health workers) within colonias in Hidalgo County, Texas. Open-ended questions focused on availability, location, and transportation options. Data were coded using a grounded theory approach and consensus was reached.

Results: All children were of Mexican-origin (n=99), and Spanish was spoken in all households. When asked “where do you go for physical activity,” prominent locations for current PA included school (66%; school/PE/gym), home (42%; in the home/yard/patio), and parks (20%). The most frequently reported PA options were exercise equipment (88%; balls/biking/trampolines), running (66%), playing (55%), and sports (29%). Forty-seven percent stated they use a bus for transportation to PA options, 45% are driven in a car, and 20% said they walk.

Conclusions: Future research should aim to understand social and intrapersonal barriers and facilitators of PA among these children, in addition to policies concerning access to school facilities. Future PA initiatives targeting colonias children should consider programs incorporating currently available exercise equipment, while developing PA initiatives within schools, homes, and parks.
PARENTAL INFLUENCE: NUTRITION

P-096

General nutrition knowledge as a mediator of parental influences on the diets of 2-5 year old children: Systematic review results and research report

Authors: JACQUELINE D PETERS

Purpose: Objective: During the early years, parents have a major influence on children’s diets and developing food choices. After systematically reviewing cross-sectional research with parents of 2-5 year old children we investigated parenting styles as predictors of young children’s diets and whether general nutrition knowledge (GNK) mediated those influences.

Methods: Methods: Cross-sectional research. Questionnaires measured demographic and lifestyle variables, family environment, parenting styles and feeding practices, child diet, and GNK. Regression models were used to test GNK as a mediator of relationships between parenting variables and child diet (fruit/vegetable and non-core food consumption), controlling for confounders and family environment variables. Setting: Questionnaires were completed by main caregivers at home. Subjects: Parents of children aged 2-5 years (N=269).

Results: Results: In the final models, higher child fruit/vegetable consumption was associated with lower lax and overreactive parenting and restriction, higher authoritative parenting, and dining together as a family. GNK had a small, non-significant effect (t=.1.468, p=.143). Conversely, non-core food consumption was associated with higher lax and overreactive parenting as well as child age, increased takeaway food consumption and higher television viewing. GNK had a small effect (t=-.2.031, p=.043). GNK was only a significant mediator for authoritative parenting on noncore food (effect=-.005).

Conclusions: Conclusions: These findings highlight that young children’s diets may be improved by interventions targeting a range of positive and supportive parenting practices in conjunction with nutrition knowledge education for parents of young children. Further insights will come from closer attention to the role of restrictive feeding practices versus laxness, and longitudinal research.
Impact of parent perception and concern for child weight on parental feeding practices in preschool children.

Authors: Alison Coren, Kelly W Lowry

Purpose: Research suggests that a child’s BMI is associated with parental feeding practices. Parent perception and concern about child weight may mediate these associations. The purpose of this study was to examine the effect of parent perception and concern about child weight on feeding practices.

Methods: 100 parents of 2-year-old children completed the Child Feeding Questionnaire and a nurse measured the child’s height and weight at the 2-year and 2.5-year well child visits at a suburban pediatric clinic.

Results: Parental accuracy of the perception of child weight decreased as child weight increased (rho = -0.71, p < 0.01). Parents with heavier children were more likely to perceive their children as heavier (rho = 0.31, p < .01) and parents who perceived their children as heavier were more likely to be concerned about their child’s weight (rho = 0.27, p < .01). Child BMI z-score was not associated with parental concern (r = -0.08, p = 0.44). Parent perception and concern about child weight at the 2-year visit did not significantly predict restriction, pressure to eat, or monitoring at the 2.5-year visit.

Conclusions: Parent perception of child weight was a more reliable predictor of parental concern than child BMI z-score, suggesting that clinicians need to counsel parents on the medical implications of various weight categories in addition to providing parents with child measurements. Contradicting the results of studies with older children, parent perceptions were not associated with parental feeding practices. Additional studies are needed to determine these associations across development.
Assessing cultural relevance of the HOME Plus program for African American parents

Authors: Jayne A Fulkerson, Sarah Friend, Linda Fancher, Colleen Flattum, Kayla Dean, Martha Y Kubik

**Purpose:** Assess the cultural relevance of the HOME Plus program for African American (AA) parents and to inform revisions of the intervention program prior to recruitment of families from diverse cultural and economic backgrounds.

**Methods:** HOME Plus is a family-focused, randomized controlled trial (n=160 families) to reduce childhood obesity by actively engaging the whole family to increase family meals, healthy eating, and decrease media-related sedentary behavior. A pilot study (primarily white parents) demonstrated the program’s feasibility and acceptance. Three focus groups were held with AA parents of 8-12 year old children (n = 24). Parents participated in a focus group and a short survey regarding family meals and related topics planned for the intervention program.

**Results:** Similar to the primarily white pilot study participants, AA parents viewed family meals positively and viewed them as important; similar barriers were identified. Participants were “very interested” in learning more about eating more fruits and vegetables (70%), eating more meals with their family (65%), and cooking with their children (65%). Parents were less interested in decreasing media use (48%), drinking less soda (48%), and eating smaller portions (30%).

**Conclusions:** The HOME Plus program appears to be culturally relevant for AA families. Topics raised by participants that will be added to the intervention include reducing sodium and more budgeting strategies. Creative steps to address topics that families were not as interested in changing include modeling appropriate portion sizes at HOME Plus sessions and encouraging families to eliminate media use during meals.
What can child silhouette data tell us? Exploring links to parenting, food and activity behaviors, BMI, and maternal concerns

Authors: Katherine L Dickin, Laura Hubbs-Tait, Lisa Jahns, Amy R Mobley, Amelia Willits-Smith, Madeleine Sigman-Grant

Purpose: A study of resiliency to overweight explored how child silhouettes (maternal perception of child’s body size) related to child BMI, maternal concerns, parenting styles and practices.

Methods: In a diverse, multi-state sample, 175 low-income mother-child (ages 3-11) dyads were assessed for parenting styles; eating, activity and parenting practices; maternal perceptions and concerns about child weight and over-eating; and BMI.

Results: Silhouettes representing higher child BMIs were negatively associated with responsive parenting and recommended parent and child food and activity behaviors (p<0.05) but were unrelated to covert or overt control or parental modeling. Child silhouette was associated with actual BMI (0.55, p<.001) yet all mothers of overweight/obese children and almost 1/3 mothers of normal weight children underestimated. While concern about current child weight was highest (33%) among mothers of obese children, 15% of mothers of normal weight children were also concerned, viewing children as underweight. All overweight children were perceived as normal weight and mothers were unconcerned. In regression models, child silhouette predicted mothers' concerns about child overeating and future overweight (p<.001). Maternal perception of own weight was significant only for future child overweight model (p<.01). White race was associated with lower maternal concerns in both models (p<.001).

Conclusions: Child silhouettes reflected both actual and perceived BMI and were associated with maternal concerns and parenting style. Maternal underestimates of child weight status imply a need to increase awareness, but caution is advisable because concerns about over-eating and future overweight were associated with less responsive parenting and with less healthful parent and child lifestyle behaviors.
Posters

Parental Influence: Nutrition

P-100

Associations between maternal and paternal parenting styles, and restrictive parenting practices, and snack intake among adolescents.

Authors: Dorus WM Gevers, Patricia Van Assema, Ester FC Sleddens, Stef PJ Kremers

Purpose: The aim of this study was to examine the associations between parenting styles and restrictive practices towards snacking, for fathers and mothers separately. Additionally, the study aimed at assessing the association between both parent’s restrictive practices, the consistency between father’s and mother’s restrictive practices, the interaction between the consistency and both parent’s restrictive practices, and snack intake among adolescents.

Methods: Questionnaires were distributed among four secondary schools in the Netherlands. A total of 420 adolescents aged 11-15 participated. Data were collected on demographics, snack intake, five parenting styles factors, and the construct of restrictive practices for both father and mother. Parents were considered consistent in their restrictive practices if their differences in scores were within one standard deviation. Multiple linear regression analyses were conducted to examine associations between the variables of interest, controlling for adolescent’s age, gender, and socio-economic status.

Results: The parenting style factors ‘Structure’ and ‘Behavioral Control’ were significantly related with restrictive practices for both fathers (ß=.128; ß =.240) and mothers (ß =.129; ß =.246 ). Seventy-seven percent of the parents were consistent in their restrictive practices. Only restrictive practices of both parents were significantly associated with snack intake of adolescents (ß =-.234).

Conclusions: This study highlights the importance of parenting styles as determinants of parenting practices for both fathers and mothers. Inconsistency between parents in restrictive practices was not very prevalent, but there were indications that the influence of strictness towards snacking is stronger for parents which are consistent in strictness in comparison with parents which are inconsistent in strictness.
Parents are not Serving Recommended Amounts of Fruits and Dairy at Breakfast to Preschoolers

Authors: Sara J Sweitzer, Shreela V Sharma, Lariss M Loufman, Michael McAllaster, Margaret E Briley

Purpose: Breakfast consumption has been linked to child BMI and attitudes about breakfast but has yet to be explored in depth among U.S. preschoolers. The Child and Adult Care Food Program (CACFP) provides meal pattern recommendations for child care centers for breakfast. This study examined the types of breakfast foods that parents served their preschoolers at home and compared them to CACFP standards.

Methods: This was a cross-sectional study among parents of 3-5 year old children enrolled in 8 child care centers in Texas. Participating parents (n=149) completed an online breakfast recall on three random nonconsecutive days. Recalls were analyzed for food group frequency and compared to CACFP standards.

Results: Descriptive analysis of baseline recall data showed that on average only 50%, 53% and 41% of parents served whole grain foods, fruit, and 100% fruit juice respectively for breakfast. About 60%, 18% and 11% of parents reported serving milk, yogurt and cheese respectively for breakfast. Comparison of the servings by CACFP equivalents showed that parents served on average 0.65 servings of fruit, 0.54 servings of fruit juice, 0.59 servings of milk, 0.12 servings of yogurt and 0.05 servings of cheese in CACFP equivalents.

Conclusions: These results show a dual concern with respect to breakfast consumption among preschoolers. A significant proportion of the preschoolers eating breakfast at home are not being served fruits, whole grain foods and low-fat dairy on a regular basis. Moreover, those who are served these foods are not being served recommended amounts, especially for fruits and dairy.
**P-102**

**Importance of Parental Beliefs and Support for Children’s Diet Quality and Body Weight: A population-based approach**

Authors: Kerry Vander Ploeg, Yen Li Chu, Stefan Kuhle, Kate Storey, Paul J Veugelers

**Purpose:** To determine if parental beliefs and support are associated with children’s diet quality and body weight.

**Methods:** We analyzed cross-sectional data from 6,268 grade 5 students and their parents: belief included how much parents care about eating healthy; support included how often parents encourage their child to eat healthy foods. Diet Quality Index-International (DQI-I) was calculated based on responses to the Harvard Youth/Adolescent Food Frequency Questionnaire. Body mass index was calculated based on measured height and weight. Overweight was defined using the International Obesity Task Force BMI-cut-off points for children and youth. We applied random effects models to assess 1) the association of parent beliefs and support on children’s DQI-I; 2) the association of parental beliefs and support with childhood overweight.

**Results:** Parental care for eating healthy and parental encouragement to eat healthy foods were independently and positively associated with children’s DQI-I. Parental encouragement was also independently and negatively associated with childhood overweight. Relative to children whose parents encouraged them “quite a lot”, those whose parents encouraged eating healthy foods “very much” were less likely to be overweight (OR: 0.81, 95% CI 0.71;0.94).

**Conclusions:** Health promotion strategies targeting parents to care about healthy eating and encourage their child to eat healthy foods may improve children’s diet quality and result in less overweight. We recommend public health decision makers emphasize this in their strategies for primary prevention of childhood overweight.
PARENTAL INFLUENCES ON YOUNG CHILD EATING HABITS

Authors: Martin Egan, Kelly W Lowry

Purpose: The objective of this study was to review studies focused on home based observations of family mealtime interactions in 2- to 5-year-old children.

Methods: A systematic review was conducted using Medline to search for relevant articles using home-based observations of mealtimes of families from 1977 to 2011. All potentially relevant study abstracts were reviewed and categorized by type of study (i.e., cross-sectional, longitudinal), and method of data collection.

Results: Of the 7,414 titles and abstracts identified by database search, ten met the criteria above. Five of the studies were conducted on children with chronic illness (e.g., cystic fibrosis, diabetes) and five studies sampled developmentally typical children and families without a medical diagnosis. Researchers used a variety of qualitative and quantitative coding systems to review behaviors and interactions during the mealtime including the BATMAN, DINE, and MICS. Three studies focused on frequency of child and parent behaviors, four studies focused on child behaviors, and three studies focused on the quality of interactions between family members.

Conclusions: In contrast to the relatively larger number of studies on child eating behavior completed in laboratory settings, few studies have observed child and family mealtime behaviors in a home setting. Even fewer studies focused on family interactions. The use of multiple coding schemas and populations makes comparison across studies difficult. Additional studies are needed to obtain a more complete understanding of family mealtime interactions in a home setting with attention given to both parent and child roles in such interactions.
The Impact of Single Exposure Advertising and Socioeconomic Status on Parenting Behaviors and Children’s Food Choice

Authors: Aaron Boyd, Paige Johnson, David A Dzewaltowski

Purpose: To explore the impact of advertising on parent behaviors and children’s food choice, and to investigate how this relationship is moderated by socioeconomic status (SES).

Methods: Fifty-eight parent-child dyads were categorized as low income or higher income and randomized to be exposed to advertising or randomized into a control condition. Dyads viewed a cartoon with energy dense food commercials or non-food commercials. Children subsequently chose either an energy dense food or a fruit or vegetable. Parent-child behaviors were recorded. Binary logistic regression was conducted to examine the impact of advertising and SES on parent behaviors and children’s food choice.

Results: Exposure to advertising did not influence children’s food choice. Independent of advertising exposure (p<.05), more low-income children chose a fruit or vegetable over an energy dense food (OR = 5.8). When parents were not exposed to advertising, seventy-two percent of parents displayed no acts of communication or involvement in the food selection process compared to forty-five percent of parents exposed to advertising (p<.05). SES moderated the influence of advertising on parental agreement to an energy dense food (p<.05). Advertising had no impact on low-income parents agreement to an energy dense food choice (food ads, 73%; control, 75%), but fewer higher income parents agreed to an energy dense food choice after advertising (43%) compared to control (94%).

Conclusions: Advertising may prompt greater parenting practices in higher income parents compared to low income parents. These findings may suggest that low-income parents are unaware of the various ways advertising could influence their children.
**PARENTAL INFLUENCE: PHYSICAL ACTIVITY**

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**Parent Weight-Related Talk: Helpful or Harmful?**

Authors: Jerica M Berge, Rich Maclehose, Katie Loth, Marla Eisenberg, Dianne Neumark-Sztainer

**Purpose:** Little is known about parent weight-related talk (e.g. conversations about healthy eating, comments on child’s weight/size) and whether weight talk has the same negative effects on youth health behaviors and outcomes as weight teasing. The purpose of this study is to investigate associations between parent weight talk and adolescent weight and weight-related behaviors.

**Methods:** Data were taken from Project EAT 2010 (Eating and Activity in Teens) and F-EAT (Families and Eating and Activity in Teens). Socio-economically and racially/ethnically diverse parents/caregivers (n = 3,709) and their adolescents (n= 2,793) completed surveys at home (parents) or in schools (youth). Logistic regression models, adjusted for sociodemographics and clustering within families, were used to compare adolescents’ behaviors for those whose parents did and did not report each type of weight-related talk.

**Results:** Adolescents whose mothers and fathers talked with them about healthy eating and physical activity had higher fruit and vegetable intake and breakfast consumption and fewer sedentary behaviors. In contrast, adolescents whose mothers and fathers talked with them about weight/size or eating differently or exercising more to lose weight ate breakfast less often, did less physical activity, utilized more unhealthy weight control behaviors, dieted more, had higher levels of depression, lower body satisfaction, and lower self-esteem.

**Conclusions:** Findings suggest that parents’ weight-related talk can be helpful or harmful, depending on the focus of the conversation (health vs. weight control). Future intervention research may want to focus on teaching parents about the importance of the types of weight talk they engage in with their adolescents.
Combating Obesity: Effects of Parental Mediation Style on Children’s Intention to Exercise

Authors: May O. Lwin, Soo Yee Shirley Ho, Tan Xiong Gentatsu Lim

Purpose: As obesity is a rising problem in children, regular exercise is being highly promoted as one of the pillars of a healthy lifestyle in Singapore. Children are usually perceived as a vulnerable group, who are easily influenced by their family and school’s practices. This study investigates how parental mediation of exercise could shape children’s intention toward exercise.

Methods: A paper-and-pencil survey was conducted in two local schools (one primary and one secondary). The survey comprises reliable Likert-scale items that measured parental mediation style, children’s intention toward exercise, and other demographic information. A total of 639 students (49.14% female and 50.86% male) participated in this survey.

Results: Both active (F (1, 638) = 5.98, p < .05) and restrictive (F (1, 638) = 7.28, p < .01) parenting styles significantly predicted children’s intention toward exercise. Children under high active parenting style (M = 11.78, SD = 2.41) had higher intention than those counterpart under low active parenting style (M = 10.23, SD = 2.83) whereas students under high restrictive parenting style (M = 11.94, SD = 2.32) had higher intention than their counterpart (M = 10.54, SD = 2.81). The full ANOVA model consisting of both parenting styles, gender, school level (primary vs. secondary), and all the possible interaction effects yielded an effect size of .13.

Conclusions: We concluded that parenting styles have an effect on mediating children’s intention toward exercise and we discussed potential implications of study findings for health policy and proposed new ideas for future weight-management interventions.
Grandparents Raising Grandchildren Obesity Prevention Feasibility Study: Intervention Implications

Authors: Bernestine B. McGee, Glenda S. Johnson, Crystal Johnson, Valerie Richardson

**Purpose:** To describe the development of a healthy lifestyles intervention aimed at reducing the risk of obesity among young children raised by grandparents. This feasibility study sought to develop a 12 week healthy lifestyles promotion program for low to moderate income African American grandparent caregivers, and children in their care, aged 6-11.

**Methods:** Formative data was used to determine factors that hinder and promote engagement with healthy eating and physical activity. Intervention components included healthy food choices; quick, inexpensive, healthy meals and snacks; food shopping; physical activity; social support; stress control; family coping strategies and telephone follow-up between each biweekly session to promote compliance. Intervention sessions were delivered by the research staff and student health promoters. The primary outcome measures were change in health, knowledge, dietary and physical activity practices in grandparents and children.

**Results:** Among families completing the program, desirable changes were observed in diet quality and increased physical activity. Grandparents applied the healthy lifestyles knowledge to improve food practices and increase physical activity.

**Conclusions:** A healthy lifestyles promotion can be designed for grandparents raising grandchildren. However, grandparents raising grandchildren are often negatively impacted by their care giving responsibilities in several areas, including psychological stress, physical health, economic resources, custodial care and social support which may interfere with them committing to a healthy lifestyle change. The study will enhance intervention planning by developing the evidence base about culturally acceptable interventions to reduce the risk of obesity in children raised by grandparents.
PHYSICAL ACTIVITY IN ADULTS

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PT or not PT? An exercise adherence study comparing exercisers with Personal Trainer (PT) and without PT

Authors: Antonio L Palmeira

Purpose: The aim of this study is to compare Self-Determination Theory (SDT, Ryan & Deci, 2000) related variables between exercisers with Personal Trainer (PT) vs without PT’s.

Methods: Participants were 322 regular exercisers at several gyms in the Lisbon area (39.1±14.6y, last 6mo=1.9±1.2 sessions/week, 62.4% women). Ninety-five reported the use of the PT service (40% women). Attendance was monitored weekly by using the computerized records of membership cards at the turnstile entrance of the gym (3mo after psychometric testing). Exercise behavioral regulation was measured with the BREQ-2, 0.85<alpha<0.62 (Palmeira, et al, 2007). Exercise locus of causality was measured with the LCE (Markland & Hardy, 1997), alpha=0.76.

Results: Exercisers with PT attended less to the gym during the 3mo observation (M=2.01±1.15 vs 2.4±1.05 times/week, p=0.001), and had higher values of external (p<0.001) and introjected regulations (p=0.005). The locus of causality was less internal on the exercisers with PT (p=0.001). Participants that only exercised with PT did not differ from the ones that exercised with and without PT on the controlled variables.

Conclusions: The PT service is associated with less self-determined exercise regulations and smaller exercise attendance. No causality may be inferred from this study design, but we suggest that some behavior regulations towards exercise may be undermined by the PT service through a process of motivation transfer, that is, instead of finding an internal source of motivation the exerciser may transfer its behavior regulation source to the PT. This may constraint future exercise adherence if the PT service is ended.
Physical activity as a protective factor for health-related quality of life among people experiencing stressful life events

Authors: Paul H Lee, Hairong Nan, Brandford H Y Chan, Ian McDowell, TH Lam

Purpose: Previous studies have linked stressful life events to reductions in health-related quality of life (HRQoL). Conversely, physical activity (PA) has been linked to better HRQoL. This prospective study, a part of the FAMILY Project cohort study in Hong Kong, examined whether engaging in PA could mitigate the impact of stressful life events.

Methods: The time spent on moderate-to-vigorous PA (MVPA) was measured using an accelerometer, worn over 4 days. Physical HRQoL was measured using the Physical Component Subscale (PCS) of the Chinese Short Form 12 (SF-12) questionnaire. The 1,073 community-based participants who reported no stressful life events (out of a list of 18 events) at baseline were divided into those who exercised (defined as spending at least 30 minutes per day on MVPA) and those who did not.

Results: Nine months later, 567 (52.8%) reported experiencing at least one stressful life event. Among this group there was no change in PCS for those who exercised (change = -0.21, p = 0.67), but there was a significance decrease (change = -2.41, p < 0.001) for those who did not exercise. Among the participants reporting no stressful life events during the follow-up period, no significant changes in PCS were found, either among those who exercised (change = +0.20, p = 0.68) or among those who did not (change = +0.38, p = 0.40).

Conclusions: An average of 30 minutes PA per day has a protective effect of buffering the impact of stressful life events on physical HRQoL.
Understanding Reasons for Trying to Lose Weight: A Latent Class Analysis Approach

Authors: Stephenie C Lemon, Kristin L Schneider, Lori Pbert, Robert Magner, Barbara Estabrook, Susan Druker, Qin Liu

**Purpose**: The purpose of this study was to identify distinct classes of adults with respect to reasons for trying to lose weight, and to assess factors associated with class membership.

**Methods**: The cross-sectional study included 414 overweight and obese Massachusetts public high school employees who reported currently trying to lose weight. Latent class analysis (LCA), which included 9 reasons for trying to lose weight as indicators and adjusted for socio-demographic and health status variables, was used to define distinct sub-groups (classes). Multinomial logistic regression was used to determine the associations of gender, age, education, having children in the home, self-perceived weight status, self-rated health status and physician recommendation for losing weight with latent class membership.

**Results**: The LCA resulted in three-classes of reasons for trying to lose weight: class 1) improving health status only (31.2% of the sample); class 2) improving health status and looking/feeling better (52.4%); and class 3) improving health status, looking/feeling better and improving personal/social life (16.4%). Compared to those in class 1, those in class 2 were more likely to be female (OR=4.38; p<0.001) and younger (OR=0.97 per year; p=0.04). Compared those in class 1, those in class 3 were more likely to be female (OR=6.39, p<0.001), younger (OR =0.95 per year, p=0.002), have children in the home (OR=3.88, p=0.001), and perceive themselves to be very overweight (OR=7.06, p<0.001).

**Conclusions**: The results suggest distinct classes of people with respect to motivations for weight loss, on which intervention programs could be tailored to potentially enhance the likelihood of success.
P-111

Effects of Aerobic Exercise on Melatonin and Catecholamine Levels of Young Women

Authors: Andrea Y Arikawa, Camille de Meirelles, William Thomas, Sanjay R Patel, Mindy S Kurzer

Purpose: To determine the effects of regular aerobic exercise on melatonin levels and sleep of young women. We also examined the effects of exercise on levels of catecholamines and cortisol because these hormones have been previously shown to affect melatonin secretion.

Methods: Participants were sedentary young women, aged 18-30 years, non-smokers, BMI 18-40 kg/m2, not using any hormonal contraceptives. Participants were randomized into a control group or an exercise intervention for 4 menstrual cycles. The exercise group was asked to complete five 45 min exercise sessions per week. Exercise intensity was set at 65-70% of maximum age-predicted heart rate (max HR) and increased every four weeks to reach 80-85% of maxHR. Melatonin in blood, urinary 6-sulfatoxymelatonin, epinephrine, norepinephrine and cortisol were measured by enzyme-linked immunosorbent assays (ELISAs). Sleep duration, sleep quality and bedtime were assessed via questionnaires filled out at baseline and post-intervention.

Results: There were no significant differences between groups in final hormone measurements or in change-from-baseline in any of the hormones, although there was a trend toward a greater decrease in SMT-night in the exercise group (−1.0 vs +0.8, p = .059). No significant within-group changes from baseline were found. Even though at the end of the study there were no differences between groups in sleep hours, bedtimes, or sleep quality, both groups reported a significant decrease in PSQI score.

Conclusions: There was no evidence of an effect of chronic aerobic exercise for 16 weeks on levels of melatonin, cortisol or catecholamines measured in urine of young sedentary women.
Weight and weddings: Engaged men’s body weight ideals and wedding weight management behaviors

Authors: Lori A Klos, Jeffery Sobal

Purpose: About 90% of adults marry during their lives, and many couples invest substantial resources into their wedding ceremony. Prior research suggests that brides-to-be commonly strive towards cultural body weight norms, but little is known about wedding-specific body weight ideals and behaviors among engaged men.

Methods: A cross-sectional study of a sample of 163 engaged men (mean age 28.7 +/- 6.9 years) asked them to complete a questionnaire asking about current weight and height, ideal wedding body weight, wedding weight importance, weight management behaviors, characteristics of their upcoming wedding ceremony, and demographics. Data were analyzed using paired t-tests, linear and binary logistic regression, and ANOVA.

Results: Results revealed that discrepancies between these men’s current weight and reported ideal wedding weight averaged 9.6 lbs (SD=16.1, p <.001). Most considered being at a certain weight at their wedding to be somewhat important. About 39% were attempting to lose weight for their wedding, and they used an average of 7.1 +/- 2.4 behaviors to do so (e.g., increasing fruit and vegetable intake). Attempting weight loss was more common among men with higher BMIs, those planning more formal weddings, and those who considered being the right weight at their wedding as more important.

Conclusions: Weight-related appearance norms appear to be less salient among engaged men compared to prior studies of engaged women. Some individual and wedding-related characteristics were associated with men’s approaches to weight and weddings. Future research should use longitudinal designs and measure other dimensions of men’s appearance (e.g., muscularity) to examine weight and life course events.
Factors predicting physical activity among overweight/obese and normal weight adults differ: A Theory of planned behaviour study

Authors: Ariane Bélanger-Gravel, Gaston Godin, Andrea Bilodeau

**Purpose:** Determinants of physical activity among adults have been extensively studied. However, very few studies focused exclusively on overweight or obese individuals. According to some authors, the determinants of a given behaviour are specific and should be addressed before designing any interventions. Thus, the aim of this study was to verify if the factors influencing physical activity differed between overweight/obese (OV/OB) and normal weight (NW) adults.

**Methods:** Undergraduate students and employees from a local university participated in a three-week prospective study on Survey Monkey. At baseline, participants completed a questionnaire assessing an extended version of the Theory of planned behaviour: intention, perceived behavioural control (PBC), attitude, subjective norm, anticipated regret and moral norm. Physical activity behaviour was self-reported at baseline and at follow-up by means of the Godin leisure-time physical activity questionnaire.

**Results:** Overall, 92 OV/OB and 227 NW participants completed the study; attrition rate of 36.3% at follow-up. Among OV/OB participants, a hierarchical multiple regression analysis indicated that behaviour was predicted by past behaviour, attitude and subjective norm, explaining 44.8% of the variance. Physical activity among NW participants was predicted by past behaviour and PBC, explaining 53.2% of the variance.

**Conclusions:** Results suggest that the determinants of physical activity among OV/OB adults might differ from the determinants of NW adults. More precisely, OV/OB adults seem to place greater importance on the potential health benefits associated with physical activity and the social approval of being physically active.
The Association Between Physical Fitness and Academic Achievement: An Ecologic Study

Authors: Jud C Janak, Kelley Gabriel, Harold W Kohl III, Steven H Kelder

Purpose: The association of physical fitness with cognitive function in children and adolescents is still under study. The purpose of this study was to describe the association between academic achievement, body mass index (BMI), and cardiovascular fitness (CVF) in a large sample of elementary-, middle- and high-school students in Texas.

Methods: FITNESSGRAM® data were collected by state legislative mandate during the 2008-2009 academic year. Fitness test results for 2,784,924 students were matched with a standardized composite academic test (TAKS) and aggregated over 150 legislative districts. Univariate analyses were conducted on the percent of students meeting TAKS standards by BMI and CVF quintiles. Analyses of variance with Tukey adjustment were used to examine differences between the most favorable 5th quintile (referent group) and all other quintile categories.

Results: The percent of students meeting TAKS standard was significantly different between BMI and CVF quintiles, regardless of sex or grade category (p<0.001). After adjustment, the prevalence of students meeting the TAKS standard was significantly higher in the referent category compared to all other BMI and CVF categories, regardless of sex or grade category (p<0.05). Linear modeling suggested that a 5% increase in the prevalence of students meeting healthy BMI and CVF standards would result in a 5.7% and 2.8% increase in the prevalence meeting TAKS standards, respectively (p<0.001).

Conclusions: Findings suggest a healthy BMI and CVF are associated with higher academic achievement in Texas students. This ecological study supports the need for additional research examining the role of potential confounders and/or effect modifiers in this relationship.
Sedentary Behavior and Depressive Symptoms: Cooper Center Longitudinal Study

Authors: Beth Wright, Laura F DeFina, Kerem Shuval

**Purpose:** To examine the association between sitting time and depressive symptoms, while controlling for cardiorespiratory fitness (CRF), physical activity, and other confounders.

**Methods:** Patients provided self-reported history of myocardial infarction (MI), depression, anxiety, depressive symptoms by CES-D10, physical activity, and sedentary behavior by questionnaire during a clinical examination at the Cooper Clinic (Dallas, TX). Clinical covariates measured at the examination included CRF, body mass index (BMI), and vitamin D. Categories of sitting time were sitting almost all the time, sitting ½ of the time, sitting ¾ of the time, and sitting ¼ or less of the time on a typical day. A logistic regression model was used to assess the odds of depressive symptoms (CES-D10>10) if reportedly sedentary when adjusting for age, BMI, serum vitamin D, physical activity, CRF, and history of MI, depression, or anxiety.

**Results:** Men (n=2,637) and women (n=1,251) were age 52 ± 10 and 50 ± 11 years, respectively. Men who sat more were more likely to have depressive symptoms as compared to those who sat ¼ time or less (sitting ½ time OR=2.4, 95%CI: 1.03, 5.57; sitting ¾ time OR=2.67, 95%CI: 1.16, 6.17; sitting almost all the time OR=2.5, 95%CI: 1.02, 6.11). No association was found in women.

**Conclusions:** In this cross-sectional analysis, sedentary behavior was associated with depressive symptoms among men, but not women.
PHYSICAL ACTIVITY IN CHILDREN

Children’s school travel: The role of self-efficacy and outcome expectations

Authors: David McMinn, Norah M Nelson, Shemane Murtagh, David A Rowe

Purpose: An understanding of the predictors of school travel behavior may help in the development of interventions aimed at curbing declining rates of active school travel. This study aimed to investigate the psychological predictors of children’s school travel behavior, and to determine the main decision maker regarding travel mode choice.

Methods: Participants were 166 children (8-9 yr) and 143 parents. Steps were measured for the journey to and from school using accelerometers. Parent and child questionnaires were used to determine age, gender, home-school distance, car ownership, deprivation level, mode of travel, decision maker, self-efficacy for commuting-related tasks, and outcome expectations for walking to school. Self-efficacy and outcome expectations were entered into hierarchical multiple regression models to investigate their ability to predict commuting activity while controlling for confounders (distance, car ownership, deprivation level, and school).

Results: 49% of participants walked to school. Parent self-efficacy (beta =.26, p<.01) was the only predictor of commuting behavior for the journey to school. No parent or child psychological attribute significantly predicted school-home commuting behavior. Car ownership significantly predicted commuting behavior for the journey to (beta =-.24, p<.01) and from school (beta =-.25, p<.05). Parents reported overwhelmingly (90%) that they were the main decision makers regarding mode choice.

Conclusions: Parent self-efficacy predicts commuting behavior to school. Interventions aimed at increasing walking to school should target older children who have autonomy to change their behaviour or focus on changing attitudes of parents who primarily decide how their child travels to school.
Impact of an active video game on healthy children’s physical activity

Authors: Tom Baranowski, Janice C Baranowski, Teresia M O’Connor, Deborah Thompson, Anthony Barnett, Ester Cerin, Tzu-An Chen

**Purpose:** This naturalistic study tests whether children receiving a new (to them) active video game spontaneously engage in more physical activity than those receiving an inactive video game, and whether the effect would be greater among children in unsafe neighborhoods, who might not be allowed to play outside.

**Methods:** Participants were children 9-12 years of age, BMI greater than 50%tile, but less than 99%tile, and not having a medical condition that would preclude physical activity or playing video games. A randomized clinical trial assigned children to receiving two active or two inactive video games, the peripherals necessary to run the games, and a Wii console. Physical activity was monitored using accelerometers for 5 weeks over the course of a 13 week experiment. Neighborhood safety was assessed with a 12 item validated questionnaire.

**Results:** There was no evidence that children receiving the active video games were more active in general, or at anytime, than children receiving the inactive video games. The outcomes were not moderated by parent perceived neighborhood safety, child BMI z-score or other demographic characteristics.

**Conclusions:** These results provide no reason to believe that simply acquiring an active video game under naturalistic circumstances provides a public health benefit to children.
Efficacy beliefs in high school physical education: Trans-contextual relationships between tripartite efficacy perceptions, autonomous motivation, and leisure-time physical activity

Authors: Ben Jackson, Peter R Whipp, James A Dimmock, Martin S Hagger

**Purpose:** Alongside their confidence in their own ability (self-efficacy), students develop a degree of confidence in their teacher’s capabilities (other-efficacy), and also estimate how confident their teacher is in their ability (relation-inferred self-efficacy, RISE). Physical education (PE) research has demonstrated that the constructs within this ‘tripartite model’ correlate positively with leisure-time physical activity (LTPA). However, the pathways through which students’ PE efficacy beliefs predict LTPA are unclear. This study examined the relationships between students’ tripartite efficacy beliefs, their autonomous motivation for PE and LTPA, and their LTPA.

**Methods:** Prospective, self-report data were collected from 986 Singaporean high school students (M age = 14.09, SD = .89). Participants reported efficacy perceptions and PE motivation at time 1, LTPA motivation a week later (time 2), and their physical activity participation another week later (time 3).

**Results:** Structural equation modeling revealed that other-efficacy (β = .11, p = .001) and RISE (β = .70, p <.001) predicted increased self-efficacy, and students reported more autonomous motivation for PE when they were confident in their own (β = .55, p <.001) and their teacher’s ability (β = .19, p <.001). In turn, greater autonomous motivation for PE predicted increased LTPA, both directly (β = .26, p <.001) and indirectly via increased autonomous motivation for LTPA (β = .13, p = .001).

**Conclusions:** These findings support the trans-contextual associations that have been documented between PE experiences and physical activity engagement outside school, and also provide novel insight into how students’ tripartite efficacy cognitions may underpin these predictive effects.
Middle school students’ sleep duration and patterns: Associations with physical activity and television time

Authors: Lara A Latimer, Keryn E Pasch, Andrew E Springer, Steven H Kelder

Purpose: Many youth do not regularly get sufficient or consistent sleep, and many have low levels of activity and high levels of TV time. The present cross-sectional study examined the association between activity and television time and sleep duration and patterns.

Methods: Participants included 1,429 U.S. eighth grade students in central Texas (m age=13.9; 29% Caucasian, 49.9% Hispanic, 11.2% African-American, 9.8% Other; 55.5% Female). Students completed a self-report survey on a range of behaviors including physical activity, television time, sleep duration and patterns. Mixed effects regression models were used to determine the relationship between physical and television time and sleep duration and patterns controlling for age, gender, race/ethnicity, and socioeconomic status.

Results: More days of vigorous and moderate physical activity were associated with shorter weekend sleep duration (p=0.003 and p=0.03, respectively) and a later weekend bedtime (p=0.003 and p=0.0008, respectively) as compared to weekdays. Higher levels of TV time were associated with shorter weekday sleep duration (p=0.01), a later bedtime on weekends (p=0.005), and a later wake time on weekends (p<0.0001) as compared to weekdays.

Conclusions: A lack of sleep on weekends may be due to scheduled physical activities, (i.e., sports games and practices), however physical activity was not associated with weekday sleep. Television time may be related to lower weekday sleep as students who watch television likely do so in the evening, keeping them up during the week, especially if there is a TV in the bedroom. Future studies are needed to examine possible mechanisms for these relationships.
Across the ditch: a comparison of how Australian and New Zealand youth use their time

Authors: Rebecca M Stanley, Katia Ferrar, Yannan Jiang, Timothy S Olds, Ralph Maddison

**Purpose:** How young people use their time is associated with their health and well-being. Use of time varies with many factors, including age, sex and socio-economic status. Examination of country-specific environmental and socio-cultural factors may help explain time use differences and the underlying mechanism of health-related time use behaviour. The purpose of this study was to describe and compare self-report use of time across different activity sets in Australian and New Zealand youth aged 10-16.9 years, using consistent methodologies and the same measurement tool.

**Methods:** Secondary data analysis of two nationally representative cross-sectional surveys, with eligible participants from the 2007 Australian National Children’s Nutrition and Physical Activity Survey (n=1399) and the New Zealand 2008/2009 National Survey of Children and Young People’s Physical Activity and Dietary Behaviours (n=491). Self-reported time use data were collected using the Multimedia Activity Recall for Children and Adults (MARCA). Multiple regression analysis was conducted to compare use of time between countries, adjusting for age, sex and body mass index.

**Results:** On average, New Zealand youth engaged in more physical activity (21 min), cognitive activities (12 min) and sleep (13 min), whereas Australian youth spent more time in sedentary screen time activities (52 min), compared with their New Zealand counterparts.

**Conclusions:** Even though Australia and New Zealand are considered similar countries, there are unique time use patterns, which may result in different health outcomes. These differences can in part be attributed to environmental and socio-cultural difference, and the findings may enhance the scope, utilisation and efficacy of health-related interventions and policies.
Active Video Game (AVG): A Potential Physical Activity (PA) Intervention Tool for School Children in Exercise Motivation and Fitness

Authors: Yan Liang, Patrick WC Lau

Purpose: The present review aims to evaluate the efficacy of AVG to motivate children to exercise and the fitness outcome of AVG play. This study also aims at providing useful suggestions for further intervention studies which intend to apply AVG in the school setting.

Methods: We use (active video game OR exergame* OR interactive game) AND (child* OR adolescent* OR teenage OR youth) to search relevant articles in electronic databases. The selection criteria are: 1) articles should be published in international academic peer-reviewed journals; 2) the participants or target group should include at least one subgroup of children or adolescents (age<18); 3) the studies should examine physical or psychological outcomes of children’s AVG playing.

Results: AVG was similar in intensity with mild to moderate intensity PA. Studies show that children are likely to perceive AVG fun, though there are some gender and age differences in their perceptions toward AVG. Following these studies, researchers have employed AVG to conduct PA interventions. Several positive physical outcomes, such as improved peak VO2, PA level, and body composition, and some positive psychological outcomes, such as children’s self-efficacy and perceived social support, have emerged.

Conclusions: It is plausible that AVG is an effective intervention tool to motivate children to engage PA and improve fitness. Further studies should be aware of the impact of different types of AVG, and choose the right type of AVG for different target groups in terms of age and gender. Further studies should also focus on how to sustain the positive outcomes of AVG intervention.
Bristol Girls Dance Project feasibility trial: Outcome and process evaluation results

Authors: Simon J Sebire, Russell Jago, Ashley R Cooper, Anne M Haase, Jane Powell, Laura Davis, Jade McNeill, Alan A Montgomery

**Purpose**: To examine the feasibility of a novel after-school dance programme to increase physical activity among 11-12 year-old girls.

**Methods**: Three-arm, cluster randomised controlled pilot trial (N = 210). Three schools received the intervention (2, 90-minute dance classes / week for 9 weeks). Participants at two control schools received incentives for data collection and participants at two further control schools received incentives and a delayed dance workshop. Consent, attendance, enjoyment and exertion were measured and accelerometer data collected at baseline (time 0), week 9 (time 1) and week 20 (time 2). Analysis was descriptive. Process evaluation interviews were conducted with participants and dance teachers.

**Results**: The consent rate was 40.1%. Mean attendance was 13.3 sessions (max = 18) but markedly lower at one school. The provision of accelerometer data exceeded 77% at each assessment but was greatest in the control arms. Exertion ratings were low but enjoyment was high. At time 2, 95% CIs suggested 5 to 12 minutes more weekday MVPA in the intervention versus the incentives group, and between 6 minutes fewer and 1 minute more weekday MVPA compared with the incentives plus workshop group. The process evaluation highlighted that programme revisions should include less creative (inactive) time, broader dance genres and development of behaviour policies.

**Conclusions**: It is possible to recruit 11-12 year-old girls to participate in an after-school dance study which they enjoy and provide research data. The intervention has potential to positively affect the physical activity of 11-12 year old girls but an adequately powered RCT is required.
Physical Activity and Self-esteem in Children and Adolescents – A Self-Determination Perspective in the Program PESSOA

Authors: Ana C Santos, Fonseca C Sofia, Antonio L Palmeira, Sandra S Martins, Cláudia S Minderico, Luis B Sardinha

Purpose: The main purpose of this cross-sectional study was to test the hypothesis that relative autonomy (RAI) mediates the relationship between physical activity and self-esteem in children and adolescents.

Methods: Participants were 1779 students (902 girls; 11–15 y; 12.73±1.09 y), enrolled in Oeiras’ schools that participate in the Program PESSOA. Physical activity, basic psychology needs (BPNS), motivational regulations (BREQ-2) and self-esteem (RSES) were measured by self-report. Independent sample t-test, ANOVA and Pearson correlations were used to determine differences between genders and BMI groups, and to analyze the associations among the examined variables, respectively. Multiple linear regression analysis was used to examine the indirect effects of RAI on the association between physical activity and self-esteem.

Results: 25.3% and 25.6% of boys and girls respectively, were overweight or obese and 40% of boys and 28.7% of girls were physically active. Boys were more physically active, had more self-esteem and feelings of competence than girls. No significant differences were found in RAI between genders (p=.056). Physical activity was negatively related to BMI (p<.001) and positively related to self-esteem (p<.001), RAI (p<.001) and competence (p<.001), and self-esteem was positively related to competence (p<.001). A direct path from physical activity and self-esteem was not significant, and this relationship was mediated by autonomous motivation in boys and girls with normal weight and obese, but not in overweight boys and girls.

Conclusions: Children and adolescents with higher levels of physical activity, also have higher levels of self-esteem, probably because they simply enjoy and take pleasure in their practice.
The Colorado Active Learning Project (CALP): Organizational and environmental strategies for promoting physical activity in low-income elementary school children

Authors: Andrew E Springer, Miranda Stovall, Courtney Byrd-Williams, Yasas Tanguturi, Katie Case, Elaine S Belansky

Purpose: In 2009, approximately half of Colorado children aged 5-14 years did not meet vigorous physical activity (VPA) recommendations of 20 minutes on 3 days per week. This study describes the Colorado Active Learning Project (CALP), a school-based project aimed at increasing physical activity (PA) in elementary school children in 12 schools in rural Colorado and presents baseline findings on recess-based PA conducted during a pilot phase of the study in four of the 12 schools.

Methods: CALP builds off ecological theoretical perspectives of health behavior by targeting the school social-organizational and built environments. Strategies include: a.) peer-led games structured activity time; b.) classroom-based activity breaks; and c.) playground markings to encourage active play during recess and active learning during class time. Baseline assessments of 2nd and 4th grade students’ engagement in moderate-to-vigorous physical activity (MVPA) and VPA during recess were conducted using SOFIT. Observations of two 2nd and two 4th grade classes at each school were conducted in early fall 2011.

Results: On average, 2nd and 4th graders spent 69.0% of their 20-minute recess period in MVPA and 17.8% in VPA (n=32 class observations, with 8 children observed per class observation). Boys participated in more MVPA and VPA across grades (p<.03), and 2nd grade students engaged in more VPA (p<.05). Playground activities differed by grade level and gender.

Conclusions: Baseline findings reinforce the importance of recess for children’s PA and identify an opportunity for decreasing gender and grade level PA disparities via additional structured activity opportunities in rural Colorado.
Physical fitness performance in adolescents from an urban and a rural area of Ecuador

Authors: Susana Andrade, Angélica Ochoa, Roos Verstraeten, Silvana Donoso, Rosendo Rojas, Greet Cardon, Patrick Kolsteren

Purpose: In Ecuador four out of the ten leading causes of death are due to cardiovascular diseases. Physical fitness is a good earlier predictor of CVD. Little is known about the fitness of Ecuadorian adolescents. We aimed to document the physical fitness difference among adolescents from an urban and a rural area of Ecuador.

Methods: A cross-sectional study was conducted between January 2008 and April 2009 in 618 adolescents (52.1% males) aged 11 to 15 years old attending secondary schools in Cuenca (urban n=477) and Nabón (rural n=141) -Ecuador. Data collection included weight, height and four tests of the EUROFIT battery: shuttle run test (cardio-respiratory fitness), short shuttle run (speed-agility), sit and reach (flexibility), and vertical jump (muscular fitness) Body Mass Index was calculated using the Quetelet formula, weight status was defined according to the IOTF criteria.

Results: The prevalence of overweight and obesity add up to 23.9% in Cuenca and 18.5% in Nabon. Rural adolescents have a higher speed-agility, but lower cardio-respiratory and muscular fitness than urban adolescents (all p-values < 0.001) with a mean difference of 18.8sg, 0.7stage and 5.1cm respectively. The performance in all components of fitness in both areas was higher in normal weight adolescents than in overweight or obese adolescents (p-value< 0.005; Rural: speed-agility; Urban: cardio-respiratory, speed-agility and muscular fitness)

Conclusions: The fitness performance in Ecuadorian adolescents is low compared with other studies in adolescents. Overweight and obese subjects show a lower performance. Therefore, programs that encourage adoption of healthy patterns in physical activity should target in Ecuadorian adolescents.
Prevalence and determinants of behaviors related to body weight control among high school female athletes.

Authors: Élaine Morissette, Vicky Drapeau, Steven Couture, Pierre Valois, Claude Goulet, Véronique Provencher, Benoît Lamarche

**Purpose:** Concern regarding body weight management is a major issue for many athletes, particularly among female athletes. The objectives of this study were: 1- to compare the prevalence of behaviors related to body weight control between female athletes and non-athletes and 2- to compare the socio-cognitive determinants of these behaviors between the two groups.

**Methods:** High school female athletes (n=255, mean age 14.1 ± 1.4 years) and non-athlete female controls (n=95, mean age 13.8 ± 1.4 years) completed a first questionnaire based on the theory of planned behavior (TPB) to identify the determinants of the intention to adopt body weight control behaviors (i.e. restrictive dietary practices) and a second questionnaire assessing body weight preoccupations.

**Results:** Concern regarding body weight was similarly prevalent in athletes and non-athletes (67% vs. 71% respectively, P=0.41). The proportion of athletes and non-athletes who reported attempts to lose weight within the last year was also comparable between both groups (40% vs. 49% respectively, P=0.11). Multivariate regression analyses showed that among attitude, subjective norm and perceived behavioral control, attitude was the only determinant of the intention to use restrictive dietary practices in both athletes (R2=45%, P<0.0001) and non-athletes (R2=30%, P<0.0001).

**Conclusions:** Concern regarding body weight is highly prevalent among high school female athletes, but no more than among non-athletic female controls. Data suggest that future interventions should focus primarily on modifying beliefs that influence attitude towards positive behaviors related to body weight control among high school females.
Variables associated with active and sedentary behavior during the after-school period

Authors: Eric E Wickel

**Purpose:** This study examined the ability of demographic, person, and location correlates to predict group membership within active and sedentary categories.

**Methods:** Time-use interviews from the Study of Early Child Care and Youth Development were analyzed to report levels of moderate-to-vigorous physical activity (MVPA), light physical activity (LPA), screen, and non-screen time at ages 9 and 10 yrs during the after-school period (3-6 pm) (ncases = 1816). Time estimates across several person and location codes were also available. Binary logistic regression analyses – using a median split for each active and sedentary category – were conducted. Area under the curve (AUC) was used to assess model classification after the inclusion of correlates.

**Results:** Boys were more likely to exceed median levels of MVPA (1.5 times) and screen (2.0 times), whereas girls were more likely to exceed median levels of LPA (2.0 times) and non-screen (1.8 times). Accounting for gender increased the AUC 6 to 9% within each category. Time in public places increased the likelihood of LPA (1.7 times) and decreased the likelihood of screen time (1.8 times), whereas time outside the home increased the odds of exceeding median MVPA levels (2.6 times). Reporting time with both parents (combined) increased the likelihood of higher non-screen levels (1.6 times). Overall, including person or location correlates increased AUC an additional 3 to 9%; however, only modest increases in AUC were observed after subsequent steps.

**Conclusions:** Numerous correlates of human behavior likely exist; therefore researchers are encouraged to report model classification values to assist with interpretation.
A RCT to Examine Peer Support Skills Training and Behavioral Weight Loss Treatment for Overweight Adolescent Females

Authors: Noel Kulik, Deborah F Tate, Dianne S Ward

**Purpose:** Peer support (PS) has been shown to impact diet and physical activity among adolescents, yet whether social support can be created and its impact on weight loss (WL) remains largely unexplored. The purpose of this study was to test the effects of an enhanced PS WL intervention on perceived support and WL.

**Methods:** Forty-one females (age: 15.2 years, BMI = 34.6, 58.5% white) were randomized to a 4-month face-to-face cognitive-behavioral weight loss program (CB) or the same program enhanced with PS skills training and practice (CB+SS).

**Results:** Results show a between-groups difference on friend support for healthy eating (F(1,33) = 9.16, p = .005) and exercise (F(1,33) = 5.69, p = .023). Both groups scored high on group cohesion and climate, but the CB+SS group scored significantly higher on group integration. Within the CB+SS group, there was a significant increase from 4W to 16W in support from group peers (t (18) = -2.57, p = .019, d = .47), suggesting a continued increase in support, even as meetings were less frequent. Participants lost an average of 6.4 pounds (SD: 7.65). WL did not differ by Tx. Session attendance was high for both groups and associated with WL.

**Conclusions:** Little is known about how PS can be created in a WL program. Findings suggest that PS in a WL program can be created and that group integration can be enhanced through specific strategies. Creating PS within the context of a WL intervention may be beneficial. Future research is needed to determine if PS is equally important for WL and maintenance.
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Revealed Preference for Physical Activity as a Treatment for Prepartum Depression

Authors: Paul Rowan, Anthony J Greisinger, Kimberly Brown, Frances A Smith

Purpose: For depressive disorders in the prepartum, providers (Bilszta 2010) and patients (Bennett 2010) are wary of birth defect risk from antidepressants. Non-pharmacologic alternatives including physical activity/exercise (Ravindran 2009) can address depression while suiting patient preferences. Within certain parameters, exercise can be performed safely throughout pregnancy (ACOG 2002).

Methods: When beginning pregnancy care, women with elevated depression symptoms were recruited if they had not pursued mental health care within the three weeks following systematic depression screening. With a semi-structured interview, we explored barriers and treatment preferences. Then, participants completed the Strength of Depression Treatment Preference scale (Raue, 2009): respondents rate first, second and third preference from these choices: “antidepressant medication,” “individual or group psychotherapy;” “combined medication and psychotherapy;” “herbal remedies;” “religious or spiritual activities;” “exercise;” “doing nothing.”

Results: Interview data were analyzed by Framework Analysis (Ritchie and Spencer 1994). With preliminary data from the first seven participants, none nominated exercise as a desired treatment in the qualitative interview. SDTP results differed: when presented with the noted treatment choices, three ranked “exercise” as their first preference, one as second preference, and three as third preference. “Antidepressant medication” was not the first choice of any respondent.

Conclusions: Exercise is a preferred prepartum depression intervention, and is preferred over medication. Exercise may need to be suggested. Since depression treatment adherence (Dwight-Johnson, et al. 2001) and response (Lin et al 2005) depend partly upon preference, awareness of exercise needs to be boosted among women of child-bearing age. Evidence status and preference needs to be promoted among obstetric providers.


**WIC educators’ strategies and challenges in recommending healthy lifestyle changes among low-income pregnant women**

Authors: Mei-Wei Chang, Costellia Talley, Susan Nitzke

**Purpose:** The purpose of this study was to identify knowledge sources, strategies, and challenges used by WIC (the Special Supplemental Program for Women, Infants and Children) educators’ when encouraging low-income pregnant women to adopt healthy lifestyle behaviors (eat healthier and be physically active).

**Methods:** Three focus groups were conducted with 24 WIC educators from three collaborating WIC clinics in Michigan. Responses and discussions triggered by semi-structured interview questions were transcribed to identify common themes.

**Results:** WIC providers reported that they gained knowledge of how to encourage clients to make healthy lifestyle changes from credible internet sites, their formal education, professional development, and personal experience. Strategies used were building rapport, assessing clients’ readiness to change, tailoring education, referring clients to free community resources, emphasizing small and gradual changes, and explaining pro and cons of healthy lifestyles. WIC providers also faced several challenges when providing healthy lifestyle recommendations. For example, they didn’t always know if their strategies were effective because they had limited follow-up contacts. Also, many clients show very little interest in learning and their stressful lives preclude adoption of healthier lifestyle practices. Unreliable self-reported pre-pregnancy weight and providers’ time constraints added further difficulties.

**Conclusions:** WIC providers used a variety of strategies to encourage low-income pregnant women to make healthier lifestyle modifications. However, limited contact with clients and providers’ time constraints prevent them from evaluating effectiveness of strategies used and limit their ability to provide effective recommendations to improve nutrition and physical activity during pregnancy.
**More and less: importance of eating well and regular physical activity in pregnancy**

Authors: Susan J de Jersey, Jan Nicholson, Leonie K Callaway, Lynne Daniels

**Purpose:** Pregnancy has been described as a teachable moment for obesity prevention. Women have been shown to be more nutritionally aware in pregnancy than other life course stages. The aim of this analysis was to compare healthy (Hwt)(BMI<25kg/m²) and overweight (Owt)(BMI>25kg/m²) women’s perceptions of the importance of healthy eating and physical activity during pregnancy.

**Methods:** Pregnant women (n=584) aged 29+/-5 (mean+SD) years were recruited at 16+/-2 weeks gestation. The importance of eating well and regular physical activity, and how this had changed since becoming pregnant and demographics were assessed by questionnaire. Measured height and self report pre-pregnancy weight was used to calculate BMI.

**Results:** Eating well was rated as very important by the majority of participants (70%). This had become “a little” or “a lot” more important since becoming pregnant for most participants (84%), and was similar between weight groups. Less physical activity was reported by 61% Hwt and 51% Owt (p=0.026) participants. Regular physical activity was very important for 38% of participants with no group difference. More Hwt women reported the importance of physical activity had not changed or become less important since becoming pregnant compared to Owt participants (61% vs 51%, p=0.016).

**Conclusions:** Nutritional awareness was high among pregnant women, however this was not mirrored by similar awareness of the importance of physical activity. Promoting the importance of regular physical activity in addition to eating well may be important for obesity prevention in pregnancy. 1Phelan. 2010 AJOG. 2Szwajcer et al. 2005 EJCN
Perception of change in nutrition and physical activity appears different by weight status in pregnant women

Authors: Susan J de Jersey, Jan Nicholson, Leonie K Callaway, Lynne Daniels

Purpose: Nutrition and physical activity are key modifiable factors associated with weight outcomes in pregnancy. The aim of this analysis was to compare healthy (Hwt)(BMI<25kg/m2) and overweight (Owt)(BMI>25kg/m2) women's perceptions of changes in dietary intake and physical activity and actual behaviours since becoming pregnant.

Methods: Pregnant women (n=584) aged 29+/−5 (mean+SD) years were recruited at 16+/−2 weeks gestation. Self reported dietary and activity behaviours, changes in amount of food and physical activity since becoming pregnant, and demographics were assessed by questionnaire. Measured height and self report pre-pregnancy weight was used to calculate BMI.

Results: More Owt women reported no change or less in the amount of food consumed compared to Hwt (55% vs. 30%. p<0.001). Owt women were more likely to consume less than recommended serves of fruit (p=0.05), and report consumption of takeaway (p=0.002), sweetened beverages (p=0.005) and high fat savoury biscuits (p=0.02) once a week or more. Hwt women were more likely to report “A lot” or “a little” less activity (61%) compared to Owt women (52%, p=0.026). There was no difference between Hwt and Owt women for total minutes of physical activity, however total physical activity sessions (p=0.044) was lower for Owt women.

Conclusions: Perceptions of change in lifestyle factors and actual behaviours during pregnancy appear different according to pre-pregnancy weight status. These perceptions and behaviours may have implications for health outcomes during pregnancy. Reporting errors or real changes may be responsible for these differences.
Antenatal Physical Activity Counseling Among Healthcare Providers

Authors: Jenn Leiferman, Margaret J Gutilla

**Purpose:** Pregnant women often report a lack of knowledge concerning the safety of exercising during pregnancy and believe that if they received information it would facilitate their engagement in physical activity. The often incorrect information or complete absence of counseling by healthcare providers (HCPs) may compound this problem. The purpose of the present study was to assess HCPs’ attitudes, beliefs, knowledge, perceived barriers and current practices related to antenatal physical activity.

**Methods:** A cross-sectional surveillance study was conducted on 185 HCPs who provide obstetric care (i.e. 47% obstetricians, 30% family medicine practitioners, and 23% certified nurse midwives) of which 70% were female and 92% Caucasian.

**Results:** The majority of HCPs believed physical activity was beneficial (95%) and that it was their responsibility to talk with their patients about physical activity (84%). However, only 50% of the HCPs were knowledgeable about the current physical activity guidelines and 29% had low confidence related to talking to their patients about physical activity. Moreover approximately half of the HCPs reported they did not provide antenatal physical activity counseling and 70% reported that they do not currently provide educational materials pertaining to antenatal physical activity. Commonly cited barriers pertained to insufficient time, inadequate skills and knowledge, and availability of resources. There were also significant differences on attitudes, beliefs, and current practices across the three types of providers.

**Conclusions:** These findings provide insight to future intervention work aimed at increasing antenatal physical activity counseling among healthcare providers.
Ethnic differences in the home food environment and parental food practices among families of low-income Hispanic and African American preschoolers

Authors: Katherine Skala, Ru-Jye Chuang, Alexandra Evans, Ann-Marie Hedberg, Jayna Dave, Shreela V Sharma

Purpose: The family and home environment are important in shaping the dietary patterns of young children, yet research among low-income minority groups is limited. The purpose of this study is to characterize the ethnic differences in the home food environment and parental food-related practices in low-income, minority families of preschoolers.

Methods: A cross sectional analysis of 713 low-income African American (AA) and Hispanic parents of preschool children from 16 Head Start Centers was conducted. Parents completed a self-reported questionnaire measuring the access and availability of various foods in the home, parental practices, and meal consumption behaviors. Mixed model logistic regression and ANCOVA were used to determine the differences in the home environment and parental practices (dependent variables) by ethnicity.

Results: Unhealthy foods (sweets, and salty snacks) were highly available for both ethnic groups. Hispanic families were more likely to have fresh vegetables (AOR= 2.9, P=0.001), fruit (AOR=2.0, P=0.004), vegetables displayed in the open (AOR= 1.23, P=0.023), fruit displayed in the open (AOR= 1.81, P=0.001), and soda available in the home (AOR= 1.40, P=0.001) as compared to AA. AA families were more likely to restrict (AOR=0.63, P=0.001) and reward with dessert (AOR=0.69, P=0.001). Hispanic parents reported consuming significantly more family meals together (P=0.003) and less meals in front of the television (P =0.006) compared to AA parents.

Conclusions: Health promotion interventions should be tailored target the behavioral differences between ethnicities. Future research should examine the cultural mechanisms for these ethnic differences.
Development and Evaluation of a Nutrition Screener for Preschool Children

Authors: Wen Guo, Sharon L Hoerr, Melissa Reznar, Yakov Sigal, Marci K Scott, Amber Rosalez

Purpose: The study’s purpose was to modify and evaluate a nutrition screening form (SF) for quickly detecting risk of obesity in preschool children in order to target interventions toward behavioral risk.

Methods: This cross-sectional study evaluated a SF that was designed to reflect pediatric recommendations to reduce child obesity. Items included key food groups (fruits/vegetables, milk, sweet beverages) as well as physical activity and screen time (PA/TV). Researchers recruited parents of 2-6 year old children enrolled in a national preschool program for low-income families in the U.S. Parents (n=95) reported children’s dietary intake and PA/TV status using the SF and a set of valid instruments including a Food Frequency Questionnaire and a checklist for PA/TV. Data analysis for comparing each component of the SF to those from validated instruments included T-test, correlation, Chi square, sensitivity and specificity.

Results: Most components of the two datasets of were weakly, but significantly correlated, except for vegetables and PA. Chi Square analysis demonstrated associations for milk intake, screen time, and sweet beverages (p<0.01). Sensitivity indicated that the SF was good at identifying children at risk for low intake of vegetables (83.8%) and milk (62.5%), excessive sweet beverage intake (92%), as well as excessive screen time (69.7%).

Conclusions: The SF was useful to screen for risk of inadequate intakes of vegetables, milk, but not fruit. The SF was also useful to detect excessive screen time and sweet beverage intake, but not for inadequate PA. The SF was good to identifying risks but not to detect actual daily food/beverage intake.
Do Preschooler’s Sack Lunches Meet the Dietary Recommendations?

Authors: Maria Jose Romo-Palafox, Sara J Sweitzer, Margaret E Briley, Cindy Robert-Gray

**Purpose:** The aim of this study was to analyze the nutrient content of preschool sack lunches and compare to 33% of the Dietary Reference Intake (DRI) for energy, total fat, saturated fat, sodium, and dietary fiber.

**Methods:** Data were collected on sack lunches of preschoolers for three nonconsecutive days. The totals of 362 lunches were analyzed using Food Intake Analysis System (FIAS) to determine the dietary quality based on 33% DRI.

**Results:** The mean energy content (kcals for 3 year olds 529 + 23; year olds 511 + 18; and 5 year olds 627 + 50) exceeded the recommended 33% of the DRI for all ages. The total fat content (32% + 2%) of 3 year olds’ lunches was within the accepted range of 30–40%. The mean fat content for both 4 year olds (32% + 1%) and 5 year olds (33% + 4%) concurred with the guidelines (25 – 35%). The range for saturated fat for all ages exceeded the recommendation of 10% total energy. Lunches provided 85%, 64% and 71% of the DRI for sodium for 3, 4 and 5 year olds respectively. Dietary fiber for all ages failed to meet the required 33% of the DRI: 3 year olds (5 + 0.3 mg); 4 year olds (5 + 0.2 mg); 5 year olds (6. + 0.6 mg).

**Conclusions:** The role of total energy, fat, sodium and dietary fiber in a preschoolers sack lunches need to be a primary target for parents to prevent obesity and contribute to a healthier adult population.
Importance of Behavioral Intervention to Decreasing Dietary Risk-Factors of Cardiovascular Disease in Obese Preschoolers

Authors: Elizabeth Kuhl, Lisa Clifford, Lori J Stark

Purpose: Risk-factors of cardiovascular disease (CVD), such as high blood pressure, are already evident in obese preschoolers. The current study examined whether changes in macro- and micronutrients associated with CVD accompanied significantly greater caloric and BMI z score reductions observed for preschoolers who received a clinic and home-based behavioral intervention (BI; n=13, 54% girls, mean age=59 months, mean BMI z score=2.26) compared to enhanced standard of care (ESC, n=18, 56% girls, mean age=54 months, mean BMI z score=2.37) for treatment of obesity.

Methods: Between group comparisons of changes in macro- and micronutrients associated with CVD and adherence to American Heart Association recommendations were conducted using 24-hour diet recall data collected at baseline, 6 months (post-treatment), and 12 months (6 month-follow-up).

Results: Decreases in percent calories from saturated fat were seen for the BI group only and intake was consistent with recommendations at 12 months. BI demonstrated a significantly greater decrease in percent calories from added sugar at 12 months, but intake remained above recommendations for both groups. Percent calories from fat increased for both groups but was within the recommended range across treatment. Despite significantly greater reductions in sodium intake for BI, it remained significantly higher than recommendations for both groups at both time points. Fiber and cholesterol intake remained relatively unchanged and were significantly lower than recommendations for both groups.

Conclusions: In addition to positive weight management, our data provide preliminary evidence that BI may also be more effective in promoting lasting qualitative dietary changes that could decrease future risk of CVD in preschoolers receiving treatment for obesity.
Who is responsible for providing food for preschoolers in child care centers? 
A survey of food provision practices in two major cities in Texas, USA

Authors: Courtney Byrd-Williams, Sara J Sweitzer, Cindy Robert-Gray, Antonia Galea, Margaret E Briley, Deanna M Hoelscher

Purpose: Less than 1% of children ages 2-5 meet U.S. dietary guidelines. About 1 million children attend child care centers in Texas where food can be center-provided, parent-provided, or both. Research suggests parent-provided food is less healthy, but there are no state or national data describing food provision policies in Texas centers. The study aim was to report and compare data on who provides children's food at child care centers in two Texas cities, Houston and San Antonio.

Methods: A 10-minute phone survey was conducted at child care centers randomly selected from all licensed centers caring for 3-5 year olds in San Antonio and Houston, TX, USA, excluding Head Start centers. Staff reported center food policies and provided center characteristics (e.g., tuition assistance, estimate of % race of children enrolled, etc.).

Results: A total of 233 surveys were completed: 85 in San Antonio and 148 in Houston. More centers in Houston (29.7%) required parents to provide food, meals and/or snacks, than in San Antonio (12.9%, p<0.01). Nearly all centers in Houston and San Antonio provided some food (98.7% & 100%). Centers with parent-provided food were less likely to offer tuition assistance than centers that did not have parent-provided food (50% versus 87% tuition assistance, p<0.01). The ethnicity of children attending centers differed by city (p<0.05), with more Hispanics in San Antonio.

Conclusions: Food provision policies in child care centers differed by city, indicating intervention strategies that target both parents and centers may be needed to improve children’s diets.
Does time spent in child care influence preschool children’s physical activity?

Authors: Amber E Vaughn, Ziya Gizlice, Derek Hales, Dianne S Ward

**Purpose:** Low levels of physical activity (PA) have been associated with increased risk of child overweight. Multiple studies show that young children are not getting the recommended 60 minutes of PA during their 8-hour day in childcare. (Reilly, 2010) This study will explored whether time spent in childcare is related to children’s PA.

**Methods:** The present study used baseline data from a larger study. Children (2-5y) wore ActiGraph GT3X accelerometers, programmed with a 15-second epoch, for 7 days. Those with 3+ days (4+ hrs/day) were included in the analysis (n=282). Age-appropriate cutpoints (Pate, 2006) were used to calculate minutes of sedentary and moderate-to-vigorous physical activity (MVPA). Parent surveys captured race, education, income, child age, and time in childcare. Simple regression models were used to assess associations between PA and socio-demographic variables. Multivariable regression models were used to assess independent associations between PA and time in childcare.

**Results:** Bivariate analyses revealed that MVPA and sedentary time were significantly associated with child gender (p<.0001, 0.004), parent race (p<.0001), education (p=.016, .056), and income (p=0.065, 0.008), but not time in childcare. Multivariate models showed that time in childcare wasn’t associated with PA after controlling for socio-demographics, even when data was limited to weekdays. Hrs/wk in childcare: MVPA min (SD), Sedentary min (SD) - 0 hrs: 49.2 (20.7), 300.1 (37.1); 1-20 hrs: 53.4 (18.8), 294.7 (30.6); 20-32 hrs: 46.3 (16.7), 296.0 (28.1); >32 hrs: 49.8 (17.3), 294.2 (32.5)

**Conclusions:** While child PA appears to vary across socio-demographic variables, time in childcare does not appear to have an influence.
Shape of snack foods does not affect preschooler’s consumption amount: a repeated exposure, cross-over intervention study

Authors: Lauren E Boyer, Sibylle Kranz, Sara Laurentz

**Purpose:** This study was conducted to examine the food intake of children at snack time when the snacks were served in “normal” versus “cute” shape. Our hypothesis was that snack intake would be larger when foods were served in a cute shape. This study provides novel information on the relationship between the shape of foods and intake in young children.

**Methods:** High-fiber snacks (banana bread, pancakes, and sandwiches) served either in normal (round, square) or cute (heart, hands, animals) shape to preschoolers 2-5 years old attending a local child care center (n=27). During the 9-weeks long, prospective, cross-over intervention study each child was repeatedly exposed to each snack and shape. Snacks were served as morning or afternoon snack and caretakers’ reports were used to account for food intake of the previous meal (breakfast or lunch).

**Results:** There was no significant difference in snack consumption. However, the mean energy intake from snacks was significantly greater for White children compared with Asian children. Further, Asian children consumed much less banana bread than the other two snacks. Overall, children who had not eaten breakfast or lunch prior to the morning or afternoon snack ate significantly more calories from the snack (84.1 kcal, p-value<0.0001).

**Conclusions:** Findings of this study were unexpected. We found a strong interaction between ethnicity and snack consumption and that Asian children consumed much less banana bread than White children. Thus, although the shape of foods did not affect intake, children’s ethnic background profoundly affected snack food preference.
RURAL HEALTH

P-141

Understanding Physical Activity and Body Image through the Eyes of Rural Adolescents

Authors: Joanna L Morrissey

Purpose: The purpose of this study was to develop a theory grounded in the physical activity (PA) and body image (BI) experiences of rural adolescents. By exploring the embodied experiences within a unique population of rural Iowan adolescents, many who are overweight/obese and/or of Hispanic descent, the developed theory was used to inform a tailored PA intervention.

Methods: Eighteen adolescents (13-15 years old) participated in one-on-one interviews. Grounded theory principles were used to understand how personal PA and BI experiences are socially constructed and the meaning participants derive from such experiences. A semi-structured interview guide focused on the types of physical activities participants engage in; attitudes, beliefs and values related to PA; and the barriers to and facilitators of PA. BI questions attempted to uncover the process that participants experience in developing and managing their BI. The interviews were transcribed verbatim and analyzed using Charmaz’s (2006) version of grounded theory.

Results: Participants reported a wide range of psychological, social, cultural and environmental influences of their PA and BI experiences. Autonomy, competence, and relatedness were major themes in how participants experienced, maintained, or challenged their PA and BI experiences within their sociocultural environment.

Conclusions: To develop a sociocultural tailored health intervention, this study engaged adolescents in conversations related to their own PA and BI experiences. This study provides the health promotion field with a practical example of how PA can be delivered and practiced in a way to support a healthy lifestyle, despite varying perceptions of a healthy body size.
**Multilevel Correlates of Television Viewing Among Rural U.S. Children.**

Authors: Erin Hennessy, Alison Tovar, Sheryl O. Hughes, Raymond R Hyatt, Heather Patrick, Christina D Economos

**Purpose:** Sedentary behavior, particularly television viewing (TV), may increase children’s risk for obesity. However, the underlying mechanisms that promote sedentary behavior are unclear, particularly among rural U.S. children who are at higher risk for obesity. Therefore, home, social and neighborhood correlates of children’s TV time were examined.

**Methods:** In 2007, cross-sectional data were collected from 99 children (ages 6-11 years) and their parents living in four low-income rural areas of the United States (Appalachia, Mississippi River Delta, Southeast, and Central Valley of California). Parents completed questionnaires about the home environment (parenting style, parenting practices, parental role modeling, and media equipment), sense of connection to neighborhood, and perceived neighborhood environment in relation to physical activity and sedentary behavior. Parents also reported the amount of time their child spent watching TV.

**Results:** In multivariate analyses controlling for child sex and age, parent’s own television (TV) time ($\beta=13.39$, 95%CI: 8.62, 18.15), presence of a TV in the child’s bedroom ($\beta=235.29$, 95% CI: 24.59, 445.99), and lower sense of connection to neighborhood ($\beta=195.74$, 95%CI: 19.74, 371.95) were positively associated with children’s TV viewing. No other factors were significant.

**Conclusions:** Targeting aspects of the home environment related to parenting such as role modeling and keeping TV’s out of the child’s bedroom may be important targets for future initiatives to reduced sedentary time among rural children living in low-income communities. These targets should be considered in the context of important neighborhood factors such as social cohesion.
Rural-Urban Differences in Body Mass Index and Dietary Behaviors among Chinese Youth

Authors: May May Leung, Andrea Deierlein

Purpose: Globalization in China has resulted in increased obesity prevalence, while western influences have affected dietary behaviors among Chinese youth. The purpose of this study was to examine associations of BMI and dietary behaviors [sugar-sweetened beverage (SSB) and fast food (FF) consumption], among rural and urban Chinese youth.

Methods: Cross-sectional data were from 1,258 youth, ages 6-17.99 years, who participated in the 2006 China Health Nutrition Survey (52.9% male, 69.9% rural). Sex- and age-specific BMI z-scores were constructed using 2007 WHO growth references. Overweight/obesity was defined as BMI>=85th percentile. Logistic regression was used to estimate associations.

Results: Youth residing in urban areas were 1.5 times (95%CI 1.13, 2.10) more likely than rural children to be overweight/obese. Among rural children (ages 6-11.99 years), overweight/obese youth were 3.8 times (95%CI 1.71, 8.33) more likely to report consuming SSB on a daily basis and 2.3 times (95%CI 1.06, 4.80) more likely to report consuming FF within the previous 3 months compared to their normal weight counterparts. Although not significant, urban children (ages 6-11.99 years) were 1.9 times (95%CI 0.92, 3.91) and urban adolescents (ages 12-17.99 years) were 2.6 times (95%CI 0.87, 7.87) more likely to report consuming FF within the previous 3 months than their normal weight counterparts.

Conclusions: Though noticeable BMI differences exist between rural and urban youth, BMI association with SSB and FF consumption were similar. The results suggest that effective interventions and policies may be needed to address the childhood obesity epidemic and its related behaviors in both rural and urban areas.
The Youth Physical Activity Supports Questionnaire: Examining Urban-Rural Differences

Authors: Sandy J Slater

Purpose: To examine differences across home, school and neighborhood physical activity environments for youth located in low-income urban neighborhoods of color and rural areas.

Methods: Third, 4th and 5th grade students were recruited from six purposively selected elementary schools (3 urban and 3 rural). Students (N=253) were asked to complete a 160-item take-home survey, which asked about the youth’s home, school and neighborhood environments, as well as their physical activity and sedentary behavior, social support and parental rules. Significant differences across urban versus rural youths’ responses were examined.

Results: A number of significant differences were found. For example, preliminary results show urban youth were significantly more likely than rural youth to: have a television in their bedroom; state that their family plays together often; walk/bike to school; and, state they had good places to be active in their neighborhoods. Significantly fewer urban youth stated that they: had a place in their home or equipment in their yard where they can be active; felt safe walking around without an adult present; and, participated in sports teams. Additionally, there were no significant differences found for frequency of weekly physical activity. Most youth felt they have people to be active with; that it was easy to walk/bike around their neighborhoods; that their parents want them to be active; and they can easily find something fun/active to do.

Conclusions: Preliminary results show some interesting differences, as well as similarities across sites. Study results will help to develop interventions targeted to these special populations.
SCHOOL ENVIRONMENT

P-145

Deconstructing School Food Culture in Copenhagen

Authors: Sharon C Brown

Purpose: The purpose of this poster is to present the cultural differences found in school lunch and physical activity environments in Denmark and the United States and to show how these environments may contribute to or prevent rising childhood obesity rates.

Methods: School lunch menus were collected from public schools in Copenhagen and Lexington, Kentucky. The menus were then analyzed to determine the types and amounts of foods provided. Direct participation and observation of school meals and formal interviews with teachers and school administrators provided relevant cultural contexts. The amount of weekly activity was also measured.

Results: The school lunch programs observed in Denmark were able to provide healthier food to students than their American counterparts. The Danish school lunch environment highlights potential ways to improve the unhealthy school lunch culture in the US, including: creating a more home-like eating environment, using more freshly made food, using less processed food, focusing on organic foods, limiting student choices, engaging local chefs, allowing more time to eat, engaging students in food preparation. Significant differences were found in the number of students who regularly use active transport to and from school.

Conclusions: With clear differences in social and physical environments, overall goals, and underlying attitudes and commitments, children in Denmark may have a lower risk of developing obesity in childhood because of their dietary and activity patterns at school.
Making Healthy Choices the Preferred Choices in School settings

Authors: Mary W Murimi, Yeonsoo Kim, Heather McCollum

**Purpose:** The purpose of this school–based project was to identify barriers to healthy food choices and implement an intervention program that will make it easy for the students to make healthy choices by improving the school food environment using behavior economic strategies.

**Methods:** This qualitative study used the phenomenological approach to assess student’s perspective of healthy food choices and understanding barriers to healthy food choices. A total of 12 multilevel focus group interviews among 80 students from grades 6 to 12, all the cooks, and cafeteria managers to identify barriers to healthy food choices and to assess students’ acceptance of the modified menu were conducted. The effect of three behavior economics strategies on healthy food choices were tested over a period of three weeks.

**Results:** The results of this study showed that students were not going to choose the healthy option if it does not look good, taste good, and if the name of the food is not familiar or if they have to wait in line for too long. Behavior economics strategies that significantly influenced healthy food choices included, pre-selecting the healthy menu before Lunch and when students determined what to eat and how much to eat.

**Conclusions:** Providing nutritious foods that is appealing to the students, and applying behavior economic principles can be an effective strategy in making healthy choices the preferred choice. To improve the school lunch experience, it is important to train the food service staff in food preparation methods, food safety principles, and food presentation or marketing.
Evaluation of the Los Angeles Unified School District Physical Education Policy Implementation Plan

Authors: Mariah Lafleur, Sarah E Samuels, Robert Garcia, Seth Strongin, Brian L Cole, Sally Bullock

Purpose: Los Angeles Unified School District (LAUSD) passed a policy to improve PE in 2009 and this study assesses the outcomes. The policy aims to enforce existing requirements for minutes of PE, class content, size, and teacher credentialing.

Methods: Stakeholder interviews were conducted with 18 involved individuals including principals, teachers, parents, board members, and the superintendent. SOFIT observations in 34 LAUSD and 13 comparison schools assessed class quality, length, content and size. Interviews documented PE curriculum, class frequency, teacher credentials and policy awareness.

Results: The most important outcome of the campaign was increasing awareness of the benefits of PE. Implementation of the PE policy has been challenging due to budget cuts. LAUSD secondary schools are generally meeting the number of required PE minutes, but on average students do not spend 50% of PE in moderate to vigorous physical activity (MVPA). Average class size is 48 students and PE teachers in secondary schools are credentialed. Elementary schools are not meeting required PE minutes and do not have credentialed teachers dedicated to PE; they are spending an average of 30% of PE in MVPA. Due to the PE policy, some schools are working to improve PE. LAUSD schools are implementing PE requirements to varying degrees and class frequency and quality is similar to classes in comparison districts.

Conclusions: Secondary schools are generally meeting California state standards for PE, but quality needs to be improved to encourage more physical activity. Elementary schools need support through teacher trainings or additional resources to meet the PE requirements.
**Socioeconomic differences in student ratings of elementary school lunch menu items**

Authors: Lara A Latimer, Esbelle M Jowers, John B Bartholomew

**Purpose:** The aim was to investigate socioeconomic (SES) differences in student opinions of and preferences for school lunch menu items that were designed to be more “healthy” than existing items.

**Methods:** Participants included a representative sample of 129 students (3rd-5th grade) in two central Texas elementary schools. One represented a low SES, predominately minority population (80.8% free/reduced lunch; 72.7% Hispanic, 12.5% African-American, 9.8% White); the other a higher SES school (15% free/reduced lunch; 24.3% Hispanic, 12.9% African-American, 55.3% White). Students sampled nine menu items and answered Likert-scale items about how much they liked/disliked each item and if they would choose the item over other cafeteria foods. Independent t-tests were run to compare responses.

**Results:** Students from the higher SES school rated a range of items more positively than did students from the lower SES school, including: deli sandwich (p<.05), garden salad (p<01), vegetable soup (p<.01), and hammy ranch wrap (p<.05). In addition, students from the lower SES school reported that they were less likely to select the garden salad (p<.01), vegetable soup (p<.05), and hammy ranch wrap (p<.01). In contrast, these same children reported being more likely to select the chicken rice soup (p<.01) and yogurt/fruit plate (p<.01) over pizza, but less likely to choose the deli sandwich over pizza (p<.01).

**Conclusions:** Students from a lower SES school rated many “healthy” menu items significantly lower than students from a higher SES school. As this presents a barrier to dietary change, it may be important to supplement menu change with exposure interventions to increase liking.
Change in school nutrition-related laws at the state level from 2003 to 2008

Authors: Louise C Masse, Frank Perna, Tanya Agurs-Collins, Jamie F Chriqui

**Purpose:** When the U.S. Congress mandated in 2004 school districts that participate in the National School Lunch Program develop a local wellness policy, change in state laws were expected as state can provide the framework for complying with the policy. This paper examined whether changes in school nutrition-related law took place at the state level from 2003 to 2008 and whether changes were similar across grade levels.

**Methods:** Statutory and regulatory laws enacted in 2003 and 2008 were located by searching the Westlaw legal database. The National Cancer Institute’s School Nutrition-Environment State Policy Classification System (SNESPCS) was used to code policies addressing the following areas: competitive foods (snack and entrée) and beverages, school meal, fundraising, education, marketing, and school level requirements (see C.L.A.S.S. at http://class.cancer.gov/About.aspx). Generalized estimating procedures were employed to examine changes in law and differences among grades.

**Results:** State level school nutrition-related laws significantly changed from 2003 to 2008. In general, more stringent laws were enacted for the competitive foods (snack and entrée) and beverages sold in school and as well as for fundraising. Most states enacted a law for the establishment of a coordinating/advisory wellness team or council. Stronger laws were enacted for the elementary grades; however for many areas weak laws were enacted leaving room for improvement.

**Conclusions:** Significant changes school nutrition policies have occurred which can significant impact the school environment in the coming years. The extent to which districts and schools will take a leadership role in supplementing state policies remains to be investigated.
Evaluation of a school based behavior modification, nutrition and physical education, obesity prevention program

Authors: Tiara Rosemond, Christine E Blake, Scotty M Buff

Purpose: The Junior Doctors of Health© (JDOH) program is a collaboration between a large medical university, the SC-AHEC, and a school district that seeks to modify obesity-related behaviors in children through education, skill building, and mentoring. The purpose of this quasi-experimental, prospective field trial study was to assess the impact of the JDOH program on diet and sedentary behaviors and precursors to dietary behavior.

Methods: A questionnaire included dietary and physical activity questions from the BFRSS to assess nutrition knowledge and perceived behavioral control (PBC) for consuming fruits, vegetables, and beverages. A total of 136 children (aged 9-12) were in a pre-determined experimental group (n=73) or a wait-listed control group (63). Participants completed pre and post questionnaires which were analyzed using independent t-tests to determine differences between four groups based on prior exposure to JDOH (previous JDOH vs. no previous JDOH) and intervention type (experimental vs. control).

Results: Participants in the experimental group with the most exposure reported a significant decrease in consumption of sugar-sweetened beverages (SSB) and 100% fruit juice combined when compared to the control group with no prior exposure (p<0.04). While changes in knowledge were inconsistent, there were trends in the expected direction for knowledge questions related to specific skills and an increase in PBC for fruit, vegetable, and healthy beverage consumption with greater exposure to JDOH.

Conclusions: Findings suggest that the JDOH program has a positive impact on beverage intake and precursors to dietary behaviors in elementary-aged children that may influence children’s future risk of obesity.
Feasibility of a cooking program in an alternative education setting

Authors: Jennifer Utter, Anna Fay, Simon Denny

Purpose: The aims of this feasibility study were to determine the acceptability of cooking sessions with young people (in New Zealand) and to identify potential outcome measures for a longer term intervention. The setting was an alternative education school, where students are predominately male, experience greater socioeconomic deprivation, and have poorer nutrition than their peers in mainstream education.

Methods: Two hour cooking sessions were conducted weekly with 12 students in an alternative education centre over one school term. Cooking sessions emphasised seasonal and affordable ingredients with flexible preparation styles (e.g. stir fry, quiche). Data to determine the feasibility of the intervention were collected through weekly observations, focus groups with students at the end of term and through interviews with key staff.

Results: Overall, the cooking sessions were received positively by staff and students. Students commented on their improved cooking skills and of the high quality of the foods prepared. Of interest, students commented on the social aspects of the sessions, such as working together and getting along as a team. Observational data confirm high levels of participation by students, willingness to try new foods, and enjoyment of foods prepared. However students did comment that the foods prepared did not meet their preference as many students made requests for more meat and fewer vegetables.

Conclusions: Our feasibility study suggests that cooking sessions are well liked and appreciated in alternative education settings. Larger studies should include measures of social engagement along with cooking skills and eating behaviours as potential outcomes.
Promoting fruit and vegetable consumption in central Texas elementary school children via school organizing and community partnerships

Authors: Andrew E Springer, Sherman Chow, Alexandra Evans, Nalini Ranjit, Li Linlin, Heather N Atteberry, Rebecca McIlwain, Andrew W Smiley

Purpose: Marathon Kids® (MK) is a six-month, school and community-based program that promotes running/walking and fruit and vegetable consumption (FVC) in elementary school-aged children via tracking of walking/running and FVC, celebratory events, and positive reinforcement. We evaluated the effects of enhanced MK promotion strategies on 4th and 5th grade children’s FVC in central Texas.

Methods: A comparison group, pretest-posttest design assessed previous day, student-reported school and home FVC among three conditions: basic MK condition based on activities described above (n=7 schools); an enhanced condition (n=5 schools) that also included FVC group tracking and FVC messaging; and a school organizing condition (n=5 schools) that included the enhanced strategies plus parent-teacher-community team and FVC promotion activities (gardens, Farmer’s visits) via a school partnership with MK and Sustainable Food Center. Repeated measures regression methods assessed changes in FVC between baseline (September/October 2010), interim (January/February 2011) and follow-up (April/May 2011), adjusting for ethnicity, gender, and SES (n=484 children).

Results: School organizing condition students consumed significantly more FV between baseline and interim compared to basic students (p=0.04), with roughly ¼ cup more FV per day. Enhanced students consumed more FV at school (p=0.03). Significant increases in FV as a snack at interim were reported across conditions (p=0.02); no FVC differences at home were observed for any condition. FVC returned to baseline levels at follow-up, two months post-intervention.

Conclusions: Findings underscore the added and positive effect of school organizing and promotional activities on children’s FVC and suggest the responsiveness of children’s FVC to their social environment.
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Pilot Evaluation of the Chicago Run Program

Authors: Kelly W Lowry, Alicia Gonzalez

**Purpose:** To evaluate the impact of a school-based running program on student outcomes and student, parent, and teacher satisfaction using principles consistent with community-based participatory research.

**Methods:** Predominantly low-income and racial/ethnic minority 4th grade students at an intervention school (N=22) and at a demographically similar wait-list control school (N=25) participated in a year-long pilot evaluation of the Chicago Run program. The intervention program encourages 15 minutes of physical activity 3 - 5 days per week led by an existing school staff member and provides students with incentives for participation. The evaluation included measures of physical fitness, perception of physical activity, self-esteem, and BMI. Accelerometers were used to determine percentage of time engaged in moderate to vigorous physical activity. Cost-effectiveness was also evaluated.

**Results:** With program costs of approximately $50 per child, students who participated in Chicago Run for the recommended days per week (3-5 times/week) demonstrated improvements in physical fitness compared to students who did not participate in the program (F(1, 44) = 11.89, p=.001). Students who participated in a program in a sub-optimal manner (e.g. less than 3 days/week) did not experience the same benefits in cardiovascular fitness (F(1,35) = 0, p=.99). The program did not have a significant impact on global ratings of student self-esteem, perceptions of physical activity, or BMI. Students, parents, and teachers reported high levels of satisfaction with the Chicago Run program.

**Conclusions:** A school-based running program is an effective, cost-effective method to improve physical fitness in elementary students.
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The Daily Physical Activity Program in Ontario Elementary Schools: Supports and barriers to optimal program delivery identified by teachers and students.

Authors: Ian Patton, Tom Overend

Purpose: The purpose of this study is to identify the supports and barriers associated with the delivery of the Daily Physical Activity (DPA) program in Ontario schools. The attitudes of the teachers and students are analysed in order to fully understand how the program is being administered.

Methods: A novel 35 item questionnaire was administered to 624 randomly selected elementary school teachers (response rate 23%). A sister study of the students involved in the DPA program saw 513 students receive a 45 item questionnaire (response rate 28%). Both questionnaires addressed how DPA was run in their class and the participant attitudes towards DPA. Data was analysed using SPSS (V.17).

Results: Teachers identified time constraints, curricular demands, and space as barriers to program delivery. Students on the other identified disruptive students and class behavior as barriers. The students looked much more positively on the program than the teachers. Teachers believed that they had a sufficient knowledge to supply this program; few actually knew what was mandated by the program guidelines.

Conclusions: While this program was implemented with noble intentions, it is not being run as mandated and the children are not experiencing optimal benefits of a proper physical activity program. The children would be much better served with daily Physical Education class provided by a Physical Education specialist. While both students and teachers reported that they believe DPA should be a permanent component of the curriculum, it was clear this was only in the absence of daily PE class.
SES INFLUENCE ON NUTRITION AND PHYSICAL ACTIVITY

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Associations between urban-rural status, perceived neighborhood size, travel behavior, and weight status among low-income women in eastern North Carolina.

Authors: Thomas Crawford, Stephanie Bell Jilcott Pitts, Jared McGuirt, Thomas C Keyserling, Alice Ammerman

Purpose: To examine associations between urban-rural status, perceived neighborhood size, travel behavior, and body mass index (BMI) among low-income women in eastern North Carolina.

Methods: We conducted in-depth interviews with 35 female patients from a health department. Participants were asked to draw neighborhood boundaries on provided Google maps customized to their home address, which were then georeferenced and digitized using geographic information systems (GIS). Travel diaries were used to record detailed travel behavior for the prior three days, and then georeferenced into GIS. BMI were obtained from chart review. We examined cross-sectional associations using non-parametric Kruskal-Wallis tests and Spearman’s correlation coefficients.

Results: Of the 35 women interviewed, 54% resided in an urban setting and 46% in a rural setting. According to chi-squared tests, race and employment status were generally equally distributed among urban and rural participants. Mean neighborhood areal size was not significantly different for urban (11.6 hectares) vs rural (12.1 hectares) women, $p = 0.87$. Mean number of trips and total travel minutes was not significantly different for urban (trips 14.0, minutes 251.4) vs rural (trips 16.5, minutes 213.3), $p = 0.32$ and 0.28. Mean BMI was not significantly different for urban (37.2 kg/m2) vs rural (31.2 kg/m2), $p = 0.18$. There were no significant correlations between BMI and neighborhood size, number of trips, and travel minutes.

Conclusions: There were no associations between urban-rural status, perceived neighborhood size, daily travel behavior, and BMI. With a larger sample size, our innovative GIS methods may identify stronger associations between spatial behavior and health.
Socioeconomic Status and Physical Activity in Pre-School Children

Authors: Jorge Mota, Rute R Santos, Luisa Soares-Miranda, Carla Moreira, Susana Vale

Purpose: The purpose of this study was twofold: to analyze the differences between patterns of physical activity (PA) according to socio-economic status (SES) and to determine whether children met the recommendations in total physical activity (TPA) and moderate to vigorous physical activity (MVPA), according to their SES.

Methods: The sample consisted on 509 preschool children (3 to 6 years). The PA was assessed for 7 consecutive days by accelerometer. The SES was analyzed according to the Portuguese education system and classified as low, middle and high.

Results: Children belonging to the highest SES were less active than children belonging to Low and Middle SES (p = 0.001) in all patterns of PA (week and weekend). Regarding Total PA during the week we found that the majority of children belonging to Low and Middle SES meet the NASPE guidelines. On the other hand, more than half the children of high SES did not meet these recommendations (p <0.001) and MVPA recommendations (p = 0.035). In both recommendations children belonging to Low SES were twice more likely to meet the recommendations compared with children belonging to High SES.

Conclusions: Low SES was negatively associated with higher daily patterns of PA and guidelines compliance in preschool children.
Impact of Community Health Workers to Improve Nutrition and Physical Activity in Underserved Communities

Authors: Belinda M Reininger, Christine Acari, Henry S Brown, Kirk L Smith, Jennifer L. Gay, Kimberly J Wilson, Rosemary Welsh, Jacquelyn Siller

Purpose: Examine the effectiveness of community health worker (CHWs) outreach to promote physical activity and healthful food choices as part of community-based diabetes prevention and control programs in four Texas counties.

Methods: CHWs deliver education, nutrition, and physical activity classes for the community and diabetes self-management classes. Focused research studies including a randomized intervention trial to test the effectiveness of CHW outreach to achieve positive behavioral and clinical outcomes among Mexican Americans and a clinical cohort study to demonstrate positive changes in knowledge, behaviors and clinical indicators among diabetic patients working CHWs at a primary care clinic were used to evaluate health and economic impacts.

Results: In the intervention trial, participants (n=1,132) who reported at least one contact with a CHW were 4.2 (95% CI 2.0-8.8) times more likely to meet physical activity guidelines of 150 minutes or more of weekly physical activity and 3.6 times (95% CI 1.6-8.4) more likely to eat fruit for dessert compared to participants who did not interact with a CHW controlling for age, gender, BMI and diabetic status. Participants in the clinical cohort study with diabetes participating in CHW nutrition, physical activity and education programming with 6 to 15 months of follow-up (n=46) maintained a mean HbA1c <7.0%. The incremental cost-effectiveness ratio of the CHW intervention ranged between $10,995 and $33,319 per QALY compared to usual care. The CHW outreach program was cost-effective based on any accepted threshold.

Conclusions: CHW outreach is associated with active living and healthy eating outcomes and demonstrates cost effectiveness.
Assessing the Knowledge of Healthy Eating and Physical Activity Guidelines among Diverse Community Members

Authors: Erica Soltero, Rebecca E. Lee, Kellie Simon, Iman Sahnoune, Scherezade Mama, Fiorella Saavedra, Tracey Ledoux, Lorna McNeill

Purpose: Guidelines for healthy eating and physical activity are frequently reported, but the prevalence of obesity in America, particularly among ethnic minorities, continues to increase. It is unclear if the lack of response to guidelines is related to the dissemination of health information. This study assessed the knowledge of healthy eating and physical activity guidelines in a diverse sample of Houston community members.

Methods: 103 ethnic minority adults (women=72, men=29, M=44.3±14.5yrs) completed pre and post symposium surveys which assessed increases in knowledge of guidelines on healthy eating and physical activity.

Results: Participants identified as African American (45.1%), White (25.6%), Hispanic (18.6%), Asian (7.8%), and American Indian (1%), and were mostly educated (77% completed college). At baseline, knowledge of guidelines for daily sodium intake (49% correct), cholesterol intake (60% correct), and physical activity (30% correct) were low. Post-symposium, knowledge of guidelines increased for daily sodium intake (30% correct), cholesterol intake (32% correct) and physical activity (25% correct). Most participants (>90%) understood the importance of regular physical activity at baseline and post-symposium. All participants (100%) knew of the prevalence of obesity in early childhood, yet were unaware (19% correct) of the level of physical inactivity in preschoolers. Knowledge of physical inactivity in preschoolers improved (24% correct) post-symposium.

Conclusions: Although participants were highly educated, knowledge of guidelines on healthy eating and physical activity was initially low, revealing that targeted education is needed for minority groups, regardless of SES. Community education remains an important first step in engaging the community in the fight against obesity.
FEASIBILITY AND ACCEPTABILITY OF A GARDENING-BASED NUTRITION EDUCATION PROGRAM IN PRESCHOOLERS FROM LOW-INCOME, MINORITY POPULATIONS

Authors: Shreela V Sharma, Ann-Marie Hedberg, Ru-Jye Chuang, Tamara Lewis, Katherine Skala

Purpose: The purpose was to pilot test a garden-based preschool curriculum for feasibility and acceptability in Harris County Department of Education Head Start using qualitative and quantitative methods.

Methods: The study used a one group, pretest-posttest evaluation design. 103, 3 to 5 year old children at two Head Start centers in Harris County, Texas participated. PLANT Gardens (Preschoolers Learn About Nutrition Through Gardens), a theoretically-grounded, teacher-led, garden-based nutrition education program for preschoolers was implemented over eight weeks in spring 2008 in the two Head Start centers. Data regarding program feasibility and acceptability was obtained through post-intervention focus groups with teachers and parents, weekly lesson plan evaluation forms and, pre-post self-reported parent surveys.

Results: 28.4% of the Head Start preschooler’s population was overweight or obese, yet only 3% of parents perceived their preschooler as overweight. This pilot test revealed strong acceptability and feasibility of the PLANT Gardens program in this Head Start population. Results of the parent surveys (n=25) indicated a significant increase in their preschooler’s willingness to try new fruits and vegetables (67% at baseline vs. 84% post-intervention; p=0.026). Data were used to further refine the program components.

Conclusions: The PLANT Gardens program showed good initial feasibility and acceptability in a Head Start population. Further evaluation of behavioral outcomes using a larger sample size and a prospective design is needed.
Limited Annual Family Income Associated with Certain Healthy Behaviors

Authors: Telia Godfrey, Lesley E Cottrell

Purpose: Physical activity and consumption of healthy foods in children has declined, while obesity and other related childhood diseases continue to rise. The aim of this study was to assess the effect of annual family income (AFI) on physical activity (PA), vegetable consumption (VC), and parent support (PS) in children who participated in a school-based cardiovascular risk screening project.

Methods: Parents of children (n=506) who participated in the Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) project completed post-screening surveys. Parent responses were based on a Likert scale where “1” represented never and “5” represented daily. Descriptive statistics were calculated to assess sample characteristics. Variance analyses were used to assess the effects of AFI on the targeted health behaviors.

Results: Lower income families reported greater child PA than higher income families (F=3.3 (7), p<.01). A significant AFI effect was also noted for children’s VC (F=2.3 (7), p<.02), greater VC was associated with higher AFI. Finally, PS decreased with higher AFI in all but factor (F=3.2 (7), p<.002).

Conclusions: The decrease in child PA with higher AFI may partially be explained by decreased PS. However, the relationship between AFI and PA among the two groups still appears complex. Further investigation of the relationship between the variables may prove beneficial for improving health outcomes in children among various economic backgrounds.
Childhood Obesity: Epidemiology - A Social and Cultural Perspective

Authors: Thu Huong T Vu

**Purpose:** The purpose of this study was to explore the social and cultural aspects of the epidemiology of childhood obesity in Houston, TX.

**Methods:** Review of recent journal articles, studies, and surveys regarding the relationship between childhood obesity and other social factors, including race, ethnicity, culture, socioeconomic status, and parental responsibilities. Literatures should contain not just quantitative data or listing of social and cultural factors affecting childhood obesity, but also discuss how they accomplish that. Literatures are analyzed and compared for consistencies and inconsistencies.

**Results:** The findings are divided into three sections: socioeconomic factors, ethnocultural factors, and familial and parental influence. Socioeconomic factors include living environment and financial limitations of low-income neighborhoods. Ethnocultural factors include cultural context of food and eating habits, as well as traditional uses and meanings of food within ethnic group and society and differences in body image perspectives. Familial and parental influence includes how parental beliefs and perception of obesity affect feeding behaviors, diet, and physical activity level of children.

**Conclusions:** Childhood obesity goes beyond the genetic and environmental implications. The socioeconomic and ethnocultural factors, along with familial influences are also important determinants involved in this complicated relationship surrounding childhood obesity. Research into attitudes and behaviors of minority populations, from the community to the family level, is an important and needed area of research. Understanding the interaction and interdependence of genetic, environmental, and social influences would provide a strong base for educating and addressing misconceptions and unhealthy beliefs among health care providers, educators, and parents regarding childhood obesity.
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Assessment of perceived physical activity levels among low-income women in Pennsylvania reveals need for attention to physical activity in nutrition education

Authors: Barbara A Lohse, Kristen N Arnold

Purpose: Perceived levels of physical activity were examined among low-income women and compared with bio-psychosocial factors.

Methods: Self-reported physical activity level was gathered with an online survey about dietary behaviors in conjunction with a web-based nutrition education program that included a physical activity lesson. Eligibility criteria included being eligible for the Supplemental Nutrition Assistance Program (SNAP), healthy, and 18-45 years old.

Results: Participants (n=512) were from 39 Pennsylvania counties. Food insecurity was prevalent; 65% received SNAP benefits in the past year. Although 51% (n=256) denoted being physically active with 71% (n=362) reporting an activity level >30 minutes/day, 60% were overweight or obese. Those who considered themselves physically active ranked their eating habits as more healthful (P<0.001), worried less about having enough money for food (P=0.008), were younger (P=0.03), of normal weight (P<0.001), and more satisfied with their weight (P<0.001) compared to those not self-identified as physically active. Emotional eating and uncontrolled eating, as measured by the Three Factor Eating Questionnaire, were lower in physically active women (P=0.002 and P=0.004 respectively). Eating Competence (EC) scores, measured with the validated EC inventory for low-income (ecSI/LI), were higher among those who considered themselves physically active (30.1±8.3 vs. 24.9±8.1; P<0.001) and among those who reported physical activity > 30min/day (P<0.001). Women, physically active > 30 min/day, tended to dislike fewer foods (P=0.003), and overall had greater food preference (P=0.005).

Conclusions: A majority of low-income women self-reported being physically active. Association with positive eating behaviors supports nutrition education for low-income women that includes a physical activity component.
SOCIOECONOMIC STATUS INFLUENCE ON NUTRITION

Validation of a home food inventory among low-income Spanish and Somali speaking families.

Authors: Mary Hearst, Jayne A Fulkerson, Lauren Martin, Michelle Parke

Purpose: To refine and validate an existing home food inventory (HFI) tool for low-income Somali and Spanish-speaking families.

Methods: Formative assessment was conducted using two focus groups, followed by revisions of the HFI, translation of written materials and instrument validation in participants’ homes. Thirty low-income families with preschool-aged children (15 Spanish speaking; 15 Somali) completed the HFI simultaneously but independently with a trained staff member. Analysis consisted of calculation of both item-specific and average food group kappa coefficients, specificity, sensitivity, and Spearman’s correlation between participants’ and staff scores as a means of assessing criterion validity.

Results: The formative assessment revealed the need for few changes/additions for food items typically found in Spanish speaking households. Somali participants requested few additions, but many deletions, including frozen processed food items, non-perishable produce and many sweets as they were not typical food items kept in the home. Spanish speaking families presented more at-risk demographic characteristics, including lack of own vehicle for transportation, lower income, and more food insecurity compared to Somali families. Generally, all validity indices were within an acceptable range, with the exception of values associated with items such as ‘wheat bread’ (kappa = 0.16). The obesogenic score (presence of high fat, high calorie foods) had high criterion validity with kappa=0.57, sensitivity = 91.8, specificity=70.6, Spearman correlation = 0.78.

Conclusions: The HFI is validated for use among Spanish and Somali households with the addition and deletion of several items on the original tool. This process can be replicated with other population groups.
Egg intake frequency among low-income is not associated with lower fruit, vegetable, or fiber intake: informing nutrition education program development

Authors: Cheng-Hsin Wei, Mallika Bose, Barbara A Lohse

Purpose: To assess egg consumption frequency of low-income Pennsylvanians and examine associations with demographics and dietary intake for nutrition education program development.

Methods: Participants (n=245; 82% female; 28% white; mean age 51.4±17.8 years) from 2 urban and 1 rural population centers in low-income neighborhoods completed telephone interviews about household food behaviors and food security. Dietary intake was estimated by the Block Food Screener, a 27-item tool to assess dietary fat, fruit, vegetable, and fiber intake.

Results: Participants were food insecure with high use of nutrition assistance programs (58%) and food banks (32%); only 27% were employed. Egg intake frequency ranged from =once a month (22%) to = 5 times a week (12%) with 61% consuming eggs at least once a week; greatest frequency was 1-2 times weekly (27%). A trend (P=0.08) toward greater intake by non-whites disappeared when controlled for location. Association of post-high school education with lower egg intake (P=0.035) remained for only one site after controlling for location. As expected, dietary fat and cholesterol intakes were increased in those consuming eggs more often (both, P<0.001), but fruit, vegetables, fiber, vitamin C, magnesium, and potassium intakes did not differ even after controlling for location. The rural population center had the lowest egg consumption frequency (P=0.03) as well as lowest fiber intake (P=0.04). BMI was not associated with egg intake frequency.

Conclusions: Although egg intake frequency is associated with higher dietary cholesterol and fat intake, other healthful dietary components (e.g. fruit, vegetables, high fiber foods) are not reduced with increased egg intake.
Ethnic Differences between Low-Income African American and Latino families during the dinner meal

Authors: Kimberly A Williams, Thomas G. Power, Susan L. Johnson, Sheryl O. Hughes, L. Suzanne Goodell, J. Andrea Jaramillo Duran, Leslie A. Frankel

**Purpose:** Ethnically diverse families are at a higher risk for obesity. Parent feeding during mealtime impacts child eating behaviors and weight status; however, specific processes through which feeding influences children are poorly understood, especially in ethnically diverse families. The study aim was to observe differences in maternal-child interactions during dinner among African American and Latino families.

**Methods:** Eighty videotaped home observations of mother-child interactions were selected as part of a larger study of mealtime practices with 138 families. The 80 families were equally distributed on gender, ethnicity and weight status (healthy and overweight/obese). Influence and non-influence attempts during the meal were coded using Noldus Observer software.

**Results:** During influence attempts, Latina mothers were more likely than African-American mothers to tell their child to eat a different food, nonverbally help, and spoon feed their child. In contrast, African American mothers were more likely to tell their child to stop eating, to discourage eating by asking if the child was finished, to focus on manners, to tell the child to return to the table, to make references to internal hunger/fullness cues, and to try to influence other nonfood-related behavior. During non-influence attempts, African-American mothers and children were more likely than Latinos to give information, and to make references to food characteristics.

**Conclusions:** Results suggest that higher levels of verbal interaction exist in the feeding domain for African American versus Latina mothers. These ethnic differences can be used to guide how researchers develop and implement obesity prevention programs.
Feasibility of Using the Eating in the Absence of Hunger Paradigm with Low-Income, Minority Preschoolers

Authors: Elizabeth Kuhl, Erin Brannon, Michelle Markesteyn Ratcliffe, Jessica Valenzuela, Brandon Aylward, Richard Boles, Susan L. Johnson, Scott W Powers

Purpose: The Eating in the Absence of Hunger (EAH) paradigm has been important to identifying eating behaviors associated with overweight and obesity in preschoolers. Low-income, minority children have been under-represented in this research despite being disproportionately affected by obesity. The purpose of this study was to address this gap by examining the feasibility of the EAH paradigm, as previously conducted, in 50 African-American preschoolers (ages 36-59 months) recruited from a Women, Infant, and Children (WIC) clinic.

Methods: Preschoolers (58% girls, mean age = 46.7 months; mean BMI z score = 0.30, range = -2.48-3.29) consumed a standardized lunch until satiated and then completed the EAH protocol (fullness rating, taste test, free access procedure).

Results: Caloric intake during the free access procedure was not associated with preschooler weight. Closer inspection of our data suggests several methodological issues may have contributed to this null finding. Six preschoolers did not complete the fullness rating procedure and ratings for an additional 23 were deemed invalid as their response pattern suggested poor understanding of the rating procedure; these 29 preschoolers were significantly younger (p<0.001) and significantly less likely to be in school/child care (p<0.05) than preschoolers whose fullness ratings were deemed valid. Further, 12 preschoolers consumed <20% of recommended daily calories during the lunch meal (5 of whom reported not being full); these 12 preschoolers were significantly younger (p<0.05).

Conclusions: Future research examining whether adaptations, such as fullness rating catch trials, providing more familiar lunch food choices, and conducting the protocol in a more familiar setting, may increase the feasibility of assessing EAH behaviors with low-income, minority populations.
Outcome Evaluation of a Wellness Program over 3 Years at a Non-Profit Faith-Based Health Clinic Targeting Low Income Hispanics in the Houston Area

Authors: Monica Martinez, Ann-Marie Hedberg

**Purpose:** Casa El Buen Samaritano (CEBS) is a 501 (c) (3) organization that operates a free clinic in southwest Houston for the uninsured and indigent. CEBS patients are below 150% of federal poverty guidelines and have no form of health insurance. 24% have been diagnosed with diabetes, hypertension, or high cholesterol. Many are overweight or obese and thus at increased risk for developing future comorbidities. In response to these trends, CEBS clinicians designated nutrition education as a top priority for program development. In 2009, a nutrition wellness program was launched.

**Methods:** The 6-week program includes a collection of baseline measurements including pre and post weight, blood pressure, cholesterol, and blood glucose. Program participants receive a personalized health and diet analysis, and attend a series of classes on food choices, portion sizes, exercise, healthy cooking, diabetes, and cholesterol.

**Results:** Among the 99 participants over the last 3 years, 44 participants lost weight, 26 lowered cholesterol, and 27 lowered blood glucose during the 6 week program. The program saw an average Body Mass Index (BMI) reduction of 0.515.

**Conclusions:** The wellness program based out of this non-profit faith-based health clinic has demonstrated positive health outcomes. Participants lost weight and lowered cholesterol, blood pressure, and blood glucose. More research is needed to see if those who have completed the program continue to incorporate the wellness guidelines into daily living.
**Families using food stamps purchase less healthy foods compared to non-food stamp using peers**

Authors: Eric Calloway, Michael McAllaster, Katie McInnis, Maria Jose Romo-Palafox, Sara J Sweitzer, Margaret E Briley

**Purpose:** To investigate the sparsely studied area of shopping habits and food stamp expenditures by families with young children.

**Methods:** Mothers (n=17) from three child care centers in low-income urban zip codes returned food purchasing receipts in summer 2011. Inclusion criteria includes food stamp use or no food assistance. One subject did not meet criteria and was excluded from analysis. The remaining mothers (n=16) were 75% Hispanic, 56% obese (mean BMI 31.9 SD=-5.89), with mean family size of 4.1 (SD=1.34). Food stamp families (FSF) (n=10) and no assistance families (NAF) (n=6) did not differ significantly in geographic area, race, mother BMI, family size, or mother age. Families differed in annual household income with 70% of FSF below $40,000 compared to 33% of NAF.

**Results:** FSF spent disproportionately more total food stamp expenditure on sugar-sweetened beverages (8% vs. 5.5%) and sweet/fatty snack foods (14.3% vs. 9.8%), and less food stamps on fruits/vegetables (10.2% vs. 20.9%) and whole grain foods (0.6% vs. 2.5%) compared to NAF’s food expenditure. Both groups purchased similar proportions of high fat meats including sausage, ground beef, bacon, and hot dogs (7.3% vs. 7.9%).

**Conclusions:** FSF purchased more total food, which is supported in the literature (Fox, et al. 2004), spent less on fruits/vegetables/whole grains and more on sugar-sweetened beverages/sweet or fatty snack foods than NAF. Early dietary exposure is a major determinant of dietary preferences. Improved parental nutrition education combined with restrictive food stamp policy is needed to ensure children in FSF are exposed to healthy diets.
**Association between weight status, blood pressure, and use of farmer’s markets and supermarkets among low-income women in eastern North Carolina**

Authors: Stephanie Bell, Jilcott Pitts, Jared McGuirt, Thomas C Keyserling, Thomas Crawford, Alice Ammerman

**Purpose:** To examine associations between farmers’ market and supermarket shopping and body mass index (BMI) and systolic blood pressure (SBP) among low-income women in eastern North Carolina.

**Methods:** Female patients (18 – 44 years) were recruited from a local health department. BMI and SBP were obtained from chart review. Farmers’ market shopping frequency was dichotomized into “never” and “ever” and supermarket shopping into “low” (< 3 times / month), and “high” (≥ once / week). We examined cross-sectional associations between BMI, SBP, and shopping using chi-squared tests and Pearson’s correlation coefficients.

**Results:** Of the 355 women included, 42% reported “ever” and 58% reported “never” shopping at a farmers’ market. (Data collection is ongoing.) Those reporting “ever” vs “never” did not have significantly different BMI (30.0 (never) vs 29.9 (ever) kg/m2, p = 0.88) or SBP (117.3 (never) vs 118.2 (ever) mmHg, p = 0.58). Those reporting “high” versus “low” supermarket shopping frequency did not have significantly different BMIs (30.5 (low) versus 29.4 (high) kg/m2, p = 0.25) or SBP (118.7 (low) versus 116.8 (high), p = 0.21). Mean distance and travel time to a farmers’ market were 2.9 miles and 12.6 minutes respectively. The correlation between BMI and (1) distance (miles) was r = 0.09 (p = 0.12) and (2) travel time (minutes) was r = 0.02 (p = 0.82).

**Conclusions:** There were no associations between shopping frequency, perceived farmers’ market access, and BMI or SBP. In the future, we plan to examine associations between objectively-measured versus perceived access and BMI and BP.
UNIVERSITY STUDENTS: NUTRITION AND PHYSICAL ACTIVITY

Is junk food promoted through sport?

Authors: Louise Signal, Richard Edwards, Janet Hoek, Mary-Ann Carter

Purpose: This study assessed whether energy dense, nutrient poor food (‘junk food’) is promoted through sport in New Zealand by analysing the food and nutrition environment (policy and practice) in New Zealand sport. Internationally the food environment in sports settings has received little attention, despite large numbers of adults and children involved in sport and attending games. No researchers have undertaken direct observations of the food environment at club, regional and national sports events.

Methods: A mixed method research design was used, comprising qualitative and quantitative methods, focusing on two high profile exemplar sports – rugby and netball. Data was collected through interviews with administrators at all levels and direct observations of foods available at club, regional and national netball and rugby events in three regions in New Zealand. The four elements of the ANGELO framework for analyzing food environments; availability, economic, political and socio-cultural were used during data collection and analysis. Food and beverages were classified as healthy or unhealthy using the New Zealand Food and Beverage Classification System. Results were triangulated and compared.

Results: This study found administrators considered healthy food important, but seldom intervened to improve the food environment and none implemented policy. Junk foods dominated when economic concerns were the main driver. Where socio-cultural considerations influenced food provision more healthy options were available.

Conclusions: Results suggest sports settings promote junk food. Health promotion initiatives targeting sports administrators have potential to improve food environments in sports settings. Further research is required to confirm these findings.
Does the school food environment influence the dietary behaviors of Norwegian 11-year-olds?

Authors: Mekdes Kebede Gebremariam, Lene LF Frost Andersen, Mona M Bjelland, Knut-Inge KIK Klepp, Torunn Holm Totland, Ingunn Holden I.H.B Bergh, Nanna NL Lien

Purpose: The aim of the study is to investigate the influence of the school food environment on the dietary behaviors of 11 year-old Norwegian children in elementary schools.

Methods: Baseline data from a school-based intervention study: the Health In Adolescents Study was used. A total of 1425 11-year-old children from 35 schools from the Eastern part of Norway were included. School administrators provided information on the physical, political and socio-cultural school environment and students reported their intake of fruits, vegetables, sugar-sweetened beverages (SSB) and snacks. Multilevel modeling was used to assess the school level variance in dietary behaviors and to investigate the association of school food environmental factors with these dietary behaviors.

Results: After adjustment for student characteristics, the school level accounted for a small proportion (1.2% - 3.2%) of the variance in the dietary behaviors investigated. None of the investigated school food environmental factors were found to be related to the reported intake of fruits, vegetables, snacks or SSB.

Conclusions: Most of the variance in the dietary behaviors investigated was at the personal level. Thus in this sample, school level factors do not appear to exert a strong influence on the dietary behaviors of children. Longitudinal studies using validated measures of the school food environment are needed.
Behavioral Determinants of Physical Activity among University Students Enrolled in a Physical Education Class: A Pilot Study

Authors: Ho Han, Harold W Kohl III

Purpose: College-based efforts to promote physical activity (PA) have had varying success. Although exercise and recreation classes are popular, little work has been done to understand PA behavior outside of the classes. The purpose of this study was to assess determinants and processes of physical activity behavior outside of exercise class based on the Transtheoretical Model among university students.

Methods: A cross-sectional study design was used. 414 male and female university students enrolled in a weight training course voluntarily completed questionnaires on physical activity behaviors and Stages of motivational readiness. Cognitive and Behavioral Processes of Change were assessed. Data were collected at the beginning of the semester in which the students were enrolled. Descriptive statistics and multivariate analyses of variance were used to determine the association between physical activity performed outside of weight training class, stages, behavioral processes, self-efficacy and decisional balance.

Results: 33.1% of respondents were women. 77% of the respondents were categorized into either action or maintenance for physical activity behavior outside of class. No substantive differences across Stages were observed for five cognitive processes of change for either men or women (p>0.05). However, each of five behavioral processes of change showed a graded and significant association with Stages (Behavioral Processes Index p<0.001) and this association was evident for both genders. Both self-efficacy and decisional balance generally were significantly higher at higher Stages.

Conclusions: College students’ physical activity behaviors were active outside of PE class. Also, specific behavioral constructs were significantly different across stages of motivational readiness.
The Relationship between Social Norms and Dietary Choices among College Undergraduates

Authors: Vanessa Errisuriz, Keryn E Pasch, Elizabeth Korinek

**Purpose:** PURPOSE: The purpose of this study was to examine the relationship between perceived social norms and dietary choices in young adults.

**Methods:** METHODS: Participants were 827 students from a large, southwestern university (m age = 18.98; 50% White; 57% Female). Perceived social norms was evaluated via students self-reporting their perceptions of how many family and friends eat mostly unhealthy foods (scale of 1-5 with one being none and five being all), which was dichotomized with those at or above the median considered having high social norms regarding unhealthy eating. Students also reported how many times within the last seven days they consumed several foods or beverages on a scale from never to 4 or more times/day (i.e. coffee, fast food). Linear regression analyses were run, controlling for gender, age, BMI, ethnicity, stress, and stress management.

**Results:** RESULTS: Perceived social norms was found to be significantly, positively associated with the amount of soda, diet soda, and fast food consumed within the last seven days (p<0.05) with higher norms indicative of increased consumption of unhealthy foods. A positive relationship, approaching significance, was also found between perceived social norms and amount of coffee consumed within the last seven days (p=0.06).

**Conclusions:** CONCLUSION: Social norms may be an important factor related to dietary choices among college students. Students who perceive that a higher number of family and friends eat mostly unhealthy foods are more likely to eat unhealthy foods themselves, even after controlling for stress and stress management, two factors which have been associated with poorer dietary intake.
ASSOCIATIONS BETWEEN DIET AND GPA AMONG UNDERGRADUATE STUDENTS

Authors: Natalie Poulos, Keryn E Pasch, Cheryl L Perry

Purpose: It is well established that improved diet quality is associated with higher academic achievement among adolescents. However, this association has been understudied in a college population, where academic achievement is also a key focus and diet tends to be of poor quality. Therefore, the purpose of this study was to examine the associations between diet quality and academic achievement measured by GPA among college undergraduates.

Methods: Participants included 709 undergraduates (m age=19.0; 51.9% non-Hispanic White, 19.2% Hispanic, 21.2% Asian, 2.1% non-Hispanic Black, and 5.5% other; 58.1% Female). Students completed an online survey measuring several behaviors and other risk and protective factors including weekly dietary behaviors (ex. soda, milk, fast food consumption) and self-reported measures of grade point average. Linear regression analysis was completed for dietary index measures (healthy and unhealthy), individual dietary measures, and GPA controlling for age and gender.

Results: Healthy eating score was positively associated with GPA (p=0.002), while unhealthy eating score was negatively associated with GPA (p=0.01). Dietary behaviors associated positively associated with GPA included weekly vegetable, breakfast, and milk consumption (p<0.05). Weekly soda and fast food consumption were negatively associated with GPA (p<0.01).

Conclusions: Overall, diet quality among college students appears to be associated with GPA. Given these results and that academic achievement is a concern of many college students, programs and interventions among college students should consider the implications of overall diet quality and focus on the importance of a healthy diet not only for better overall health, but also for academic outcomes.
ENERGY DRINKS AND UNDERGRADUATES: REASONS FOR CONSUMPTION OF A DRINK HIGH IN CAFFEINE AND SUGAR

Authors: Natalie Poulos, Keryn E Pasch

Purpose: Energy drinks have become increasingly popular among college students. In addition to large doses of caffeine, they contain large amounts of sugar and are often mixed with alcohol, both of which are non-nutrient rich caloric sources. The purpose of this study was to understand the reasons for energy drink consumption, both alone and mixed with alcohol, among undergraduate students.

Methods: Participants included 585 undergraduates from a large, public US university (m age=18.7; 47% non-Hispanic White, 20.9% Hispanic, 25.5% Asian, 2.7% non-Hispanic Black, and 4.4% other; 56% Female). Students completed an online self-report survey measuring several behaviors including energy drink consumption alone, mixed with alcohol, and reasons for consumption. Descriptives were calculated for reasons for each type of consumption.

Results: Overall, 58.3% of students reported consuming energy drinks alone and 14.9% reported consuming energy drinks mixed with alcohol in the past month. The most common reasons for energy drink consumption alone included studying for an exam (37.4%), taste (24.1%), mental alertness (23.4%), and needing more energy in general (21.0%). The most common reasons for consumption of energy drinks mixed with alcohol included taste (14.4%) and to hide the flavor of alcohol (12.5%).

Conclusions: Students appear to be consumption energy drinks alone for academic reasons and taste, while they are consuming energy drinks mixed with alcohol for reasons related to overall taste and to hide the taste of alcohol. Future research should consider implications of taste as primary determinants of energy drink consumption alone and mixed with alcohol.
Assessment of nutrition knowledge, food preferences, dietary habits, eating attitudes, physical activity behaviors, Westernization level, and body size perception among students at Fu-Jen Catholic University in Taiwan

Authors: Yi-Fang Chen, Debra B Reed

Purpose: To assess nutrition knowledge, food preferences, dietary habits, eating attitudes, physical activity behaviors, Westernization level, and weight perception among university students in Taiwan.

Methods: This study included 68 students, ages 18-28. Self-reported questionnaires were used; Eating Attitudes Test (EAT-26) was used to assess eating attitudes. Descriptive statistics were determined for the primary variables. Independent sample t-test and Pearson correlation were used to determine differences and association.

Results: Among participants, 60% were female; 71% reported less physical activity than senior high school; 59% had computer or television in their bedroom; 60% reported Western foods tasted better than Taiwanese foods, 50% preferred Western foods while only 7% thought Western foods were healthier than Taiwanese foods. Over 45% considered themselves overweight or obese; however, based on self-reported height and weight, only 29% were actually overweight or obese. Female students had a significantly higher knowledge of food calorie content compared to males, t(66)=-3.01, p=0.04. Correlations between the following were statistically significant: computer usage and physical activities, r(66)=-0.27, p=0.03; Westernization and EAT-26, r(66)=0.29, p=0.02; and Westernization and dietary habits, r(66)=0.31, p=0.01.

Conclusions: In these Taiwanese students, Westernization was associated with undesirable eating attitudes and dietary habits. Also, they showed several undesirable characteristics related to physical activity and dietary behavior that put them at risk for overweight. However, due to their inaccurate self-perception related to overweight, it will be important to provide healthy strategies for weight management to prevent eating disorders.
The effects of a 6 month nutrition education program on diet quality in persons at risk for or with the metabolic syndrome

Authors: Rebecca Horne, Jessica R McLeod, Paula DN Dworatzek, Danielle S Battram

Purpose: To investigate the effects of a 6 month nutrition education program on diet quality in individuals with, or at risk for, the metabolic syndrome.

Methods: Participants who had at least 2 risk factors for the metabolic syndrome were stratified by baseline Canadian Healthy Eating Index (CHEI) scores and body mass index (BMI) and randomly assigned into 1 of 2 groups. The experimental group (n=16) consisted of 9 small group classes and 3 individual counseling (IC) sessions with a Registered Dietitian (RD), which focused on the CHEI with no dietary restriction or prescription. The control group (n=6) attended 3 IC sessions with an RD that focused on general healthy eating and portion control (standard practice). At baseline, 3 and 6 months, CHEI scores (based on two 3-day food records) and anthropometrics [BMI and waist circumference] were measured.

Results: Despite a 6.5 greater improvement in CHEI score [11.4 ± 2.59 vs 5.0 ± 3.4] among the intervention group vs control, no differences between groups were observed (p = 0.16). The improvement in CHEI scores (both groups) was mainly attributed to improvements in total fruit and vegetable and other foods scores. No differences in anthropometrics were observed over time or between groups.

Conclusions: Preliminary data suggests that an intervention that focuses on the CHEI without dietary restriction and prescription improves diet quality similarly to current standard practices. This suggests that nutrition professionals can improve diet quality in people by simply promoting a higher quality diet without focusing on dietary restriction and prescription.
Posters

LB: Adult Physical Activity

LB-178

Physical Activity and Quality of Life Through the Menopausal Transition

Authors: Maria Luque

Purpose: To examine the relationship between physical activity (PA) and menopause-specific QOL among perimenopausal women, focusing the specific effect of participation in low, moderate, or vigorous PA on menopause-specific QOL and if a dose-response relationships exists between increased PA level and QOL rating.

Methods: A cross-sectional, correlational study was conducted on primarily white women aged 40-55 years living in the Austin, Texas area. The sample of (N = 63) was recruited using a convenience sampling method. Symptoms of menopause, menopause-specific QOL, and level of PA were assessed through self-administered questionnaires. Data analysis included (a) descriptive statistics, (b) multiple regression, (c) MANOVA, (d) bivariate and partial correlation.

Results: The findings of this study revealed a significant negative correlation between PA and both total MENQOL score (r=-.30; p <.05) and total symptoms experienced (r =-.33; p < .01). Additionally, the results revealed that women with low PA participating in moderate (M=8.94, SD=2.18) or vigorous PA (M=11.77, SD=4.43). PA also had a significant effect on specific menopause symptoms, to include hot flashes, sweating, weight gain, feeling bloated, frequent urination, and avoiding intimacy. Women with low PA reported the highest frequency and greatest discomfort for all of these variables.

Conclusions: The discovery that moderate PA resulted in an increase in QOL higher than that of vigorous PA suggests that, although the level of physical activity plays an important role in QOL rating, the traditional dose-response relationship between PA and health, may not be applicable in regards to menopause-specific QOL.
Coping planning supplants action planning in explaining physical activity habit.

Authors: Pier-Eric Chamberland, Paule Miquelon, Laurence Dumont

Purpose: The goal of this study is to investigate the role of coping planning in physical activity (PA) habit formation. Contrary to action planning (de Bruijn, 2011), its importance in habit formation has yet to be demonstrated empirically. Acting by habit constitutes hypo-egoic self-regulation, in which conscious thoughts not pertinent and conflicting with execution of action are silenced (Leary, Adams & Tate, 2010). We hypothesize that, given its shared virtue of protection from conflicting goals, coping planning would be crucial in explaining habit formation.

Methods: In a cross-sectional design, 159 undergraduate students (mean age: 23 years) completed a set of questionnaires measuring PA habit, past and current frequency of PA, self-determined motivation toward PA, and the use of action and coping planning in their PA practice. Data were analyzed using hierarchical regression where coping planning was entered last.

Results: Results show a significant contribution of coping planning ($R^2_{change} = .012$, $\beta = .14$, $p = .03$) in explaining PA habit although controlling for action planning, self-determined motivation, as well as past and current frequency of PA. Coping planning supplanted action planning ($\beta = .07$, $p = .29$) in the global prediction model of habit ($R^2 = .62$, $p < .001$).

Conclusions: The data furthers understanding of factors contributing to behavior automaticity, deemed mandatory in investigating habit’s role in behavioral medicine (Sniehotta & Presseau, 2011). Limits of the study and improvements in future research are discussed in regard to prospective design and operationalization of the habit construct.
Initial Uptake and Use of the United States National Physical Activity Plan by Public Health Practitioners

Authors: Kelly R Evenson, Sara B. Satinsky, Ross C. Brownson, Amy A Eyler, Harold W Kohl III

Purpose: The 2010 US National Physical Activity Plan provides strategies to increase population levels of physical activity. In 2011, we surveyed all members of the National Society of Physical Activity Practitioners in Public Health to determine their awareness and use of the plan.

Methods: Among 492 professional US members, 290 (59%) responded to the web-based survey.

Results: Overall, 79% of these professionals were aware of the plan. Among those who were aware (n=230), almost half learned about the plan >=1 year ago (46%), while 11% learned about it in the previous month; 15% had used the plan >=6 times, while 28% had never used it. For those who had referred to the plan at least once (n=165), the most common uses were for brainstorming and discussion (73%), development and implementation of activities (55%), state-level goal setting (34%), training (33%), and state-level programs, projects, or initiatives (33%). The plan was used less at the local level (24% for goal setting and 29% for programs, projects, or initiatives). Although the respondents reported that the plan was easy to understand (81%), fit with their organization’s goals (85%), and was low risk to implement (58%), fewer agreed that changes made after the plan could be easily observed (32%), the plan was easy to implement (28%), and the plan was low-cost (25%).

Conclusions: The US National Physical Activity Plan has been broadly disseminated to physical activity practitioners working in public health. These survey results are being used to enhance the future use of the plan.
LB:ADULT PHYSICAL ACTIVITY AND NUTRITION

LB-181

Weight loss treatment in inpatients with psychiatric disorders

Authors: Attilio Carraro, Erica Gobbi, Antonio Fiorellini

Purpose: The purpose of the study was to examine the effects of exercise participation on body weight and depressive dimension in a sample of seriously overweight (BMI: 27.5-29.9) and obese (BMI = 30) inpatients with psychiatric disorders.

Methods: A retrospective review of BMI, psychiatric and exercise files was conducted for an initial cohort of 552 inpatients. Selection has been made among a group of inpatients admitted to two selected units, had a BMI = 27.5 and a Symptom Checklist-90 (SCL-90) dimension of depression = 1.5. Thirty-seven patients were included, 19 participated in a weight-management programme, including psycho-educational groups, nutritional assistance and daily exercise, 18 received standardized psychiatric treatments with exercise 3-4 times/week. Associations between exercise, BMI changes and psychological modification were investigated by Pearson’s correlation. ANOVAs for repeated measures were conducted on BMI values and on the SCL-90 Depression and General Severity Index scores.

Results: Weight-management group reported higher exercise attendance (p < .001). Pearson’s correlations between the number of the attended exercise sessions and BMI changes were statistically significant (r = .53, p < .001). The repeated-measures ANOVA showed statistically significant higher reduction of BMI in the weight-management group compared with the control group (F(1, 35) = 7.03, p = .012), no significant differences were found in SCL-90 depression and GSI scores.

Conclusions: Findings support the notion that exercise may have a positive impact on weight control programme also in people with psychiatric disorders and may help patients to cope with the psychological distress that weight loss could induce.
Osteoporosis knowledge and dietary Calcium intake among regular physical activity and sedentary elderly people

Authors: Yi-Fang Lee, Shu-Lin Lee

**Purpose:** The aim of this study was to investigate the osteoporosis knowledge and dietary Calcium intake in regular exercise and sedentary people

**Methods:** Nine regularly active (RA: age 72.4 ± 6.4) and seven sedentary elderly (SE: age 72.4 ± 6.1) voluntarily were participated in this study. A series of questionnaires about Osteoporosis Health Belief Scale-Response (OHB) and Osteoporosis-related knowledge (ORK) were used. Bone density and diagnosis osteoporosis by T score and the Ca and vitamin D intake calculation were also assessed.

**Results:** There were no statistical differences found between RA and SE group in OHB (43.78 ± 9.0 vs. 46.29 ± 4.8, p = 0.52), ORK (33.33 ± 2.6 vs. 32.57 ± 4.5, p = 0.68), and bone density (T scores: - 0.56 ± 1.43 vs. – 1.84 ± 1.00, p = 0.63). Both two groups met the minimum daily calcium requirement. There were five subjects in the SE group was in pre-osteoporotic and osteoporosis (two subject’s T scores -1.1 to -2.4; three subject’s T-scores < -2.5), and four subjects in RA group were in pre-osteoporotic.

**Conclusions:** The result showed that Osteoporosis-Related Knowledge Test and Ca intake were no difference between groups, but the bone density in sedentary subjects is lower than in regular exercise population. We speculate that may higher risk of getting osteoporosis in sedentary than in exercise group. Therefore, the education for prevention osteoporosis is important both in regular physical and sedentary elderly people.
The CHANGE Program: Comparing an interactive versus standardized obesity intervention on students’ self-esteem, functional health status, and self-efficacy for performing physical activity and nutrition behaviours

Authors: Erin S. Pearson, Jennifer D Irwin, Don Morrow

Purpose: Previous studies incorporating Motivational Interviewing administered via Co-Active Life Coaching tools (MI-via-CALC) have elicited positive results among adults with obesity. However, a paucity of MI-via-CALC obesity-based research that includes sufficient statistical power and the use of a comparison group exists. Therefore, the purpose of the Coaching towards Healthy Actions Naturally through Goal-related Empowerment (CHANGE) Program was to compare MI-via-CALC to a validated obesity intervention among university students.

Methods: Through this repeated measures design, participants (n = 45; mean age = 20.9) were randomized to either a telephone-based 12-week: (a) interactive MI-via-CALC program whereby a certified coach worked with subjects to achieve personal goals through dialogue; or (b) lifestyle modification treatment following the LEARN® Program for Weight Management. Participants completed the Rosenberg Self-Esteem Scale, Short Form Functional Health Status Scale (SF-36), and Self-Efficacy Scales for Nutrition and Physical Activity at baseline, mid and immediately following treatment, and 3 and 6-months post-intervention.

Results: Repeated measures ANOVAs revealed that both conditions elicited significant time effects between baseline and 6-months for self-esteem (p < .001, n² = .43) and 8 dimensions of the SF-36 (e.g., overall health; p < .001, n² = .55). Self-efficacy for behavioural nutrition and physical activity were also affected positively for both groups.

Conclusions: MI-via-CALC may be as effective as LEARN®, a validated and thoroughly tested lifestyle program. Given the demonstrated importance of enhancing self-esteem and quality of life when seeking to promote positive health behaviour changes among individuals with obesity, each intervention offers unique insights into the requisite elements for this process.
Electronic health records referral tool to a community lifestyle change program creates high demand among underserved adults

Authors: Jennifer K Carroll, Michele Hannagan, Mechelle R Sanders, Cheryl P Rufus, Louise V Smyth, Kevin Fiscella, Nancy M Bennett

Purpose: Assess the feasibility, facilitators, and barriers to use of an innovative electronic health records referral tool, linked to a community exercise and lifestyle change program for inner-city adults.

Methods: Family medicine clinicians (n=13) at two community health centers were randomized to early or delayed intervention groups. The intervention consisted of four one-hour sessions to teach and reinforce (1) the 5As (Ask, Advise, Agree, Assist, Arrange) for physical activity counseling and (2) use of an electronic health record referral tool linked to a community exercise and lifestyle change program. We analyzed (1) feasibility of the referral tool, measured by referrals made, and (2) facilitators and barriers to use of the tool during the initial adoption period (Oct 2009-Sept 2011) assessed by clinician interviews.

Results: 464 patients were referred, exceeding the planned maximum of 150 referrals. Patients’ mean age was 43 years, and 75% were African American, 15% Hispanic, and 10% Caucasian. Most (58 %) had Medicaid insurance, and the mean BMI was 32.5. Facilitators to use of the tool were its relative speed and simplicity, an on-site nurse coordinating referrals, and enthusiasm for the community program. Barriers were unpredictable freezes in the system due to server problems, uncertainty about programmatic capacity, and inconsistent communication about the status or progress of the referral.

Conclusions: Use of a referral tool to a community lifestyle change program was feasible and created high demand, depleting available resources to accommodate the referrals. Future work will examine enrollment, retention, and physical activity among those participating in the program.
Outcomes from an Expert Roundtable on Motivating Americans to Achieve Sustained Diet and Physical Activity Behaviors

Authors: Wendy Reinhardt Kapsak, Marianne Smith Edge, Katrina Butner, Holly McPeak, Shelley Maniscalco, Robert Post, Sylvia Rowe, Meghan Ames

Purpose: An Expert Roundtable was convened by a partnership among the US Department of Health and Human Services, US Department of Agriculture and the International Food Information Council Foundation with the purpose of establishing ongoing dialogue to identify long-term strategies for motivating consumers to implement the Dietary Guidelines for Americans and Physical Activity Guidelines for Americans using a systems-based approach.

Methods: Expert Roundtable participants (n=38) were selected to include representatives from government, academia, health professional organizations, and a variety of food and health-related industries. Throughout the one-day Roundtable proceedings, notes on participant contributions were recorded by overt observers and subsequently conceptualized. The resulting report reflects a summary of the dialogue, emphasizing main themes and priority actions, as authenticated by Roundtable participants.

Results: Three proposed priority actions resulted from the discussion: 1) Develop a coordinated multi-sector communications plan, identifying relevant successes and opportunities for continued work and partnerships; 2) Engage behavior science experts to help meet the challenges of motivating consumers, potentially through (a) inclusion on federal guidelines advisory committees and/or (b) the establishment of a separate scientific body to develop behavior change guidance; and 3) Support public-private partnerships and collaborative multi-sector approaches by engaging leaders to galvanize behavior change efforts regarding diet and physical activity.

Conclusions: The Expert Roundtable discussion suggests collaborative multi-sector efforts and inclusion of behavioral science expertise and guidance are both necessary to enhance adherence to current diet and physical activity recommendations. Further discussions are needed to develop strategic approaches for putting key Roundtable findings into action.
Use of Exercise DVD Overcomes Safety Challenges to Provide In-class Physical Education in Adult Community-level Interventions

Authors: Kirsten Corda, Debra M Palmer

**Purpose:** Federally-funded, adult nutrition education classes traditionally lack behaviorally-focused, physical education. Lack of resources and trained staff to ensure the safety of physically diverse audiences underserved by healthcare led a custom-designed exercise DVD to test the impact of in-class physical education on exercise barriers and habits, and dietary behaviors.

**Methods:** The Transtheoretical Model guided a quasi-experimental design. Classes recruited at Social Services sites throughout New Jersey were randomized, i.e., control classes received six weeks of nutrition education (intervention); experimental classes received the intervention shorted 15-20 minutes per week for physical education via the DVD. Data collection (2009-2010) included the Exercise Barriers subscale, Exercise: Stage of Change form, a Nutrition Behavior Checklist, 24-hour Diet Recalls, and existing records. Mixed-method analyses included observational and interview data.

**Results:** Findings from 19 classes characterized participants (N=471) as urban, Hispanic (34%) or non-Hispanic African-American (45%), men (42%) and women (58%) between 18 and 55 years old receiving limited incomes (95%). The DVD was found to meet its design goals including for safety, was easily reproduced (<$5.00) and distributed and well received by participants exposed to the DVD (n=237). Of those, 61% provided sufficient data to identify significant between-group differences for change in exercise barriers \( F(1, 131) = 4.12, p < 0.05 \) and mean exercise stage \( t(23) = -2.57, p<0.05 \). Change in dietary behaviors was not negatively impacted and engagement appeared to increase with increased exposure.

**Conclusions:** Use of the exercise DVD bodes well promoting moderate-intensity physical activity among the target audience without significantly decreasing program efficacy.
Effects of a five session cooking program delivered from a mobile teaching facility on self-efficacy and dietary behaviors in minority youth

Authors: Emily E Ventura, Jaimie N Davis, Melanie Castillo, Marta Miguelena, Leslie A Lytle, Donna Spruijt-Metz, Michael Goran

**Purpose:** To measure the impact of hands-on cooking classes on self-efficacy and dietary intake in minority youth.

**Methods:** Participants ages 8 to 17 were recruited from 4 Boys and Girls Clubs in the Los Angeles area for this non-randomized, controlled study. Participants (n=110) from 2 clubs received a series of 5 cooking classes delivered weekly by the Jamie Oliver Food Foundation inside a 70-foot semi truck converted into a mobile teaching facility. Youth from the other 2 clubs (n=102) received a delayed intervention. Measures included dietary intake by Block Yesterday Screener and diet-related beliefs and behaviors by questionnaire. Change scores were assessed by ANCOVA, controlling for age, gender, ethnicity, baseline measure of outcome of interest, and change in caloric intake when appropriate.

**Results:** Participants were, on average, 11.3 years old, 54% male, predominately African American (53.3%) and Latino (12.3%), and 52% were overweight, with no significant differences in these demographic variables by intervention group. Intervention youth increased self-efficacy for cooking skills (p=0.039), and these effects were more pronounced in the overweight participants (p=0.003). The overweight intervention youth also had an increase in positive beliefs about cooking (p=0.04). While no changes in nutrient/food group intake were seen in the group as a whole, the overweight participants showed an increase in dietary fiber intake (p=0.05) and a trend for increased vegetable and carbohydrate consumption.

**Conclusions:** A series of 5 cooking classes is an effective means to promote self-efficacy for cooking in minority youth, and may improve dietary behaviors, particularly in the overweight.
Diet diversity score, dietary frequency index and school children nutrition status in the province of Kenitra, north-western Morocco

Authors: Ahmed Ahami, Youssef Aboussaleh

Purpose: Child stunting is still prevalent in Morocco. This study aims to assess dietary diversity in relationship to stunting in school-age children in the province of Kenitra (Morocco).

Methods: The study was carried out in seven different schools in Kenitra province. A structured questionnaire of different items was used to collect data. A stratified random sample of 263 pupils with average age of 13 years was recruited. A health team assessed the anthropometric status. Dietary diversity was appraised with two types of indices: dietary diversity score and a weekly food frequency score (WFFS).

Results: The DDS was significantly higher in rural than in urban children, whereas the WFFS was lower in rural children, owing primarily to less frequent intake of fruits and vegetables. Maternal level of instruction was associated with a higher consumption of fruits and vegetables. Both indices were significantly associated with stunting.

Conclusions: The study suggested that diet quality is associated with growth and food diversity may provide a better reflection of diet quality.
Patterns of sociodemographic and food practice characteristics in relation to fruit and vegetable consumption in children: results from the UK National Diet and Nutrition Survey rolling programme (2008-2010).

Authors: Tsz Ning Mak, Celia Prynne, Darren Cole, Emily Fitt, Caireen Roberts, Beverley Bates, Alison M Stephen

Purpose: Determinants of diet quality in children have been actively investigated. However, very few studies have considered the combined effects of these factors on consumption. The aim of this study is to investigate the associations between combinations of sociodemographic and food practice (SFP) characteristics and fruit (F) and vegetable (V) consumption in UK children using pattern analysis.

Methods: A nationally representative sample of 642 children aged 1.5 to 10y from the UK National Diet and Nutrition Survey Rolling Programme (2008-2010) was studied. Mean F and V consumption per person/d were assessed using 4d unweighed food diaries. Computer assisted personal interview questionnaires were administered to collect data on SFP characteristics and principal component analysis was used to identify three distinct patterns of these characteristics. F and V (g/d) were regressed on the component scores of each pattern, adjusting for children’s age and sex.

Results: The first pattern, which was positively correlated with household size, number of children and number of adults per household, was associated with increased F consumption (p<0.001). Pattern two was associated with higher F and V consumption (both p<0.001), characterised by positive correlations for socio-economic status, fruit availability, organic food purchase, and negatively correlated with household size and the number of children per household. The third pattern illustrated high frequency of eating out and takeaways and was associated with a lower consumption of both F (p<0.012) and V (p<0.023).

Conclusions: Pattern analysis of diet determinants may be more informative than previous methods. Validation is needed in other populations to verify findings.
ENDOTHELIAL FUNCTION IN CHILDREN: THE EFFECTS OF DIETARY FAT INTAKE AND PERCENT BODY FAT

Authors: Ashley Anderson, Susan B Sisson, Andrew Gardner, Kevin Short, Teresa Whited

Purpose: Endothelial function is an early marker of CVD yet to be thoroughly understood in children. The purpose of this study is to determine the association between chronic dietary fat intake, adipose tissue and endothelial function in children.

Methods: Children (n=18) ages 10-18 years (females 50%, 14.78 ± 2.3 yrs) participated in this study, a one-group, repeated measures design. Endothelial function was measured by reactive hyperemia peripheral arterial tonometry with the Endo-PAT2000; two fasting scores obtained at least 48 hours apart were used to calculate the reactive hyperemia index (RHI). Percent total body fat mass was measured using DEXA. Usual dietary fat intake was determined by Block Kids 2004 FFQ online. Multivariate linear regression analyses with and without covariates (i.e., sex) were calculated to assess the relationship.

Results: Mean ± SD were: RHI=1.84 ± 0.40 arbitrary units, daily dietary fat=33 ± 5%, and fat mass=22.4 ± 9.3%. RHI was not significantly related to dietary fat intake or percent body fat in adjusted or unadjusted models. However, sex was a significant covariate with RHI in the model with dietary fat intake (p=0.02, β=0.56, R²=0.34) and approached significance in the model with percent body fat (p=0.055, β=0.38, R²=0.28). Girls had higher RHI (p=0.03, 2.04 ± 0.30) than boys (1.63 ± 0.39).

Conclusions: Sex was an important modifier variable of RHI. This research suggests the higher endothelial function typically seen in premenopausal women compared to men may have its origins in childhood, and the role of estrogen on the vasculature in growing girls should be further explored.
Assessing middle school students’ nutrient intake variance based on the availability of a la carte offerings at lunch

Authors: Samantha R Weiss, Andrew E Springer, Steven H Kelder, Joanne E Delk, Deanna M Hoelscher

Purpose: School districts in the U.S. regularly offer foods that compete with the USDA reimbursable meal, known as ‘a la carte’ (ALC) foods. These foods must abide by state nutritional regulations; however, the implementation of this program differs by district. The purpose of this study is to compare two methods of offering ALC foods on student’s lunch intake. In one scenario (extensive program), schools have a separate area for ALC food sales, which includes non-reimbursable entrees; the other scenario (moderate program) offers the sale of ALC foods on the same serving line with the reimbursable meals.

Methods: This study utilized direct observation, by trained data collectors to assess children’s lunch consumption in six schools, across two districts in Central Texas (n=373 observations). Schools were matched on socioeconomic status. Data collectors were randomly assigned students, and recorded foods on the plate, foods consumed, gender, grade, and ethnicity. Observations were entered into a nutrient database program to obtain nutritional information.

Results: Students at schools with extensive ALC consumed significantly more calories, carbohydrates, total fat, saturated fat, protein, cholesterol, calcium, iron, and sodium (p<0.05) compared to students in schools with moderate ALC offerings. In the moderate schools, 9.7% of students purchased pizza, 11.4% purchased chips and 26.1% purchased fresh fruit, while in the extensive schools, 51.8% of students purchased pizza, 13.7% purchased chips, and 14.2% purchased fresh fruit.

Conclusions: How and what ALC foods are offered can significantly affect student dietary intake. Guidelines for school ALC offerings should be maximized to encourage the consumption of healthful foods.
USING COMPUTER TAILOR NUTRITION EDUCATION TO CHANGE FRUIT AND VEGETABLE INTAKE IN NORWEGIAN SCHOOL CHILDREN: A CLUSTER RANDOMIZED CONTROLLED TRIAL

Authors: Christina CH Hildonen, Nanna NL Lien, Knut-Inge KIK Klepp

Purpose: Computer tailoring is a promising mode of delivering nutrition education to children, yet the results on effects are not consistent. The purpose of this study was to assess whether a simple, stand-alone computer tailored nutrition education (CTNE) used either once (INT1) or three times (INT3) during a three-month period was associated with higher fruit and vegetable (F/V) intake compared to a control condition (CONTR).

Methods: Data from 6th graders (n= 568, mean age 11.2 y; 49 % girls) at 25 schools in Norway were collected through self-administered electronic questionnaires at baseline and at a three-months post-intervention survey. F/V intakes were measured by validated food frequency items. Schools were randomly allocated to one of the three conditions. Due to the clustering design, multilevel analyses were conducted with F/V intake at three months follow-up as dependent variables and intervention condition, gender and F/V intake at baseline as independent variables.

Results: No significant main effects of the intervention were found, but there were also no school level variance in F/V intake. Therefore ANCOVAs were run, and a significant effect for V (p = 0.002) was found. Post-hoc analysis showed a significant higher mean intake in CT3 compared to CT1 (p=0.003) and CONTR (p=0.008).

Conclusions: The preliminary results in this study were mixed. Therefore, no firm conclusions can yet be made of whether a simple CTNE as a stand-alone tool might be sufficient to change F/V intake in this age group.
LB-193

**Beverage intake and oral health status and needs of uninsured children**

Authors: Judy A. Johnston, Monica A Fisher, Angelia M Paschal, Patricia A Cox

**Purpose:** Evaluate beverage intake of uninsured children aged 3-10 years and investigate associations between types of beverages consumed and demographics, oral health status and needs of uninsured children.

**Methods:** We conducted a parent survey during an annual one day oral health intervention that provides free care to uninsured children, 3-10 yo. Survey participants self-selected (N=157), representing 90.75% of event participants. Analysis compared children whose daily beverage intake was >50% non-healthy drinks [NHD] (only milk and water = healthy) and children whose daily beverage intake was >50% sugary drinks [SD] (only water = not sugary) to those consuming less.

**Results:** Children reported to drink >50% NHD (OR=3.08; 1.52-6.22) also drank >50% SD (OR=2.99; 1.29-6.95). Demographics: They were more likely to be older (OR=2.15; 1.13-4.07); parents were more likely to be low income (OR=2.64; 1.26-5.53), unemployed (OR=3.36; 1.49-7.59), <high school education (OR=2.78; 1.36-5.67), and complete the survey in Spanish (OR=3.23; 1.68-6.22). Oral Health: They were more likely to report problems chewing (OR=6.74; 1.83-24.82) and pain (OR=2.96; 1.30-6.73), have fair or poor oral health, be in need of filling (OR=4.59; 2.23-9.42), extraction (OR=3.44; 1.27-9.32), or treatment (filling, extraction, or relief of pain) (OR=4.78; 2.39-9.57), and to have received $500 or more in restorative dental care (OR=4.48; 2.25-8.95).

**Conclusions:** Sugary beverage consumption is linked to dental caries. Poor oral health status occurs at a higher rate in low SES populations. Older children with more years of poor oral health and nutrition behaviors were more likely to require a larger amount of restorative dental care.
Motivations for healthy eating and dietary behavior in a diverse group of adolescents

Authors: Denise Roe, Kathylynn Saboda, Scott Going, Melanie D Hingle

Purpose: This study investigated the relationship between motivation for healthy eating and dietary behavior in a diverse group of adolescents participating in a healthy lifestyle intervention.

Methods: 141 adolescents (ages 12-18 years) were enrolled from 14 afterschool programs to participate in a 12-week SMS (short message service, or text)-based intervention. Pre- and post motivations for healthy eating and dietary intake (food group servings) were assessed via self-administered questionnaires. Descriptive statistics characterized and ranked participants’ motivations for healthy eating and typical dietary intake. The relationship between motivation for healthy eating and food intake variables at pre-post was determined using Spearman’s correlation coefficients.

Results: 109 participants completed pre-post assessments. Mean age of participants was 14.2±1.7 years, 34% were female, 46% Hispanic. Mean intakes of fruits, vegetables, whole grains, dairy, and legumes did not meet dietary guidelines. Participants ranked the following reasons to eat healthy as most important: “it is very important for being as healthy as possible,” “I personally believe it is the best thing for my health,” and “I feel that I want to take responsibility for my own health.” Attitudes toward healthy eating were not associated with self-reported dietary behavior.

Conclusions: Participants’ primary motivations for healthy eating were consistent with increased desire for autonomous decision-making observed during adolescence. Interventions should be designed to reflect these attitudes/beliefs in order to effectively impact diet behavior. A lack of an association between motivations for healthy eating and dietary behavior indicates other factors may drive healthy eating behaviors in adolescents.
LB: CHILD NUTRITION AND PHYSICAL ACTIVITY

LB-195

Influence of school holidays on weight of children participating in a tertiary hospital weight management programme.

Authors: Srinidhi Rao, Shirley M Alexander

Purpose: Weight gain during holiday periods is a recognised phenomenon. In the northern hemisphere, summer is paradoxically a particularly vulnerable period for children. Outcomes regarding summer holiday weight gain in children in the southern hemisphere are unknown. We wished to determine the pattern of weight change during summer school holidays (Christmas break (CB)) in a population of obese children attending a tertiary hospital weight management programme.

Methods: A retrospective review was performed using height, weight, BMI and BMI z scores at four different time points: (1) Baseline – 2 months before CB; (2) At commencement of CB; (3) At conclusion of CB; (4) 2 months after CB. Changes in anthropometry over three time periods (pre-holiday, holiday, and post-holiday) were calculated and analysed. Weight change was standardised to an interval of 60 days to account for the difference in the interval between measurements.

Results: 50 patients (median age 8.9 years) were included in the study. 63.9% of children lost weight pre-holiday compared to 13.1% during the holiday and 34.1% post-holiday. Mean weight change pre-holiday was 0.01 kg (95% CI -0.40 to +0.42), during holiday was 1.6kg (95% CI 1.21 to 2.02) and post-holiday was 0.80kg (95% CI 0.31 to 1.28). There was a statistically significant difference in the weight change during the holiday period compared to pre-holiday period (p <0.05) and post-holiday period (p<0.05).

Conclusions: This study demonstrates that Christmas/summer school holiday is a vulnerable period for obese children. Holiday specific planning focusing on strategies to reduce/prevent weight gain is needed.
The Quest to Lava Mountain: Using video games for dietary change in children

Authors: Shreela V Sharma, Nancy Beasley

Purpose: To describe a new three-dimensional web-based action-adventure video game targeting nutrition education in children ages eight to 12 "The Quest to Lava Mountain (QTLM)", its theoretical foundation, and preliminary feasibility results.

Methods: QTLM was developed by The Cooper Institute and the Texas Department of Agriculture (2011) to promote healthy eating behaviors among children. QTLM is the first web-based video game that uses stealth learning strategies for nutrition education among elementary school children. QTLM is based on concepts from Social Cognitive Theory and the Theory of Reasoned Action and uses a reciprocal deterministic game dynamic that requires children to make appropriate food choices in order to progress and succeed in the game. QTLM uses a color-coded system (green, yellow, red) to categorize foods on the basis of nutrient density and caloric value.

Results: The QTLM prototype was evaluated for feasibility with a group of 19 Dallas elementary students (mean age 9.2 years; 84% male). The game was rated as acceptable, intuitive to play, and fun, without being overtly ‘educational’. 87% of the children rated QTLM as likable and reported that that it taught them to eat better food instead of ‘junk’ food.

Conclusions: Future research involves measuring the impact of QTLM on dietary behaviors in children using a randomized controlled trial design. If efficacious in impacting dietary behaviors, QTLM provides an age-appropriate appealing channel to disseminate and implement healthy dietary skills training either independently in after-school settings, or as an adjunct to a multi-level school-based intervention.
Implementation of an educational strategy in nutritional factors and physical activity in elementary school children in Bogotá, Colombia 2011

Authors: ESPERANZA MS FAJARDO

**Purpose:** The prevalence of childhood obesity is rapidly increasing in Colombia. The 2010 National Nutritional Status Survey showed that 13.4% of children between the ages of 5 – 17 are overweight and 4.1% obese. The purpose of this study was to design and implement an educational strategy to control nutritional factors and physical activity associated with cardiovascular risk in elementary school children.

**Methods:** A primer and an interactive video were designed and distributed to sixty children aged between 9 and 11 enrolled at an elementary school in Bogotá. The results of a previous study in that school related with food consumption and physical activity patterns, was the basis for choosing the themes for the design of the educational strategy. Parents and their children went over the educational material, and filled out a questionnaire in order to assess their understanding of these materials.

**Results:** 52 children completed the questionnaires. Most children (95%) concluded that factors such as eating a balanced diet, fruits and vegetables consumption, adequate food portions, drinking water, and daily exercise are healthy. Most parents (98%) reported these strategies help to guide the feeding of the children and their families, as well as what food they purchase (94%); they highlighted the importance of physical activity.

**Conclusions:** The onset of overweight children at a younger age has health consequences during adulthood. This nutritional problem requires establishing strategies easily applied in schools. Additional studies are needed to measure the impact of these interactive strategies focussed of nutritional education of children and their parents.
Tarahumara and Mestizo School Children in Mexico: Health differences.


Purpose: Both Tarahumaras and Mestizo children are affected by poverty when migrating from rural areas to bigger cities like Chihuahua, facing similar burden of unhealthy living conditions. Because their diverse ethnicity they might respond differently to harsh living conditions. Our purpose was to assess health differences between Tarahumara (TARA n=95, 41F, 54M) and Mestizo (MTZO n=47, 18F, 29M) boys and girls 5–16 years old.

Methods: A field study was conducted over a period of a school-day, testing for Body Composition, Plasma Lipids and Lipoproteins, TA, and Endurance (BIPTEST).

Results: Significant differences were observed between ethnic groups for age (MTZO=14.72±13.763; TARA=9.93±2.303 P<0.003), mean plasma cholesterol (MTZO=164.68±34.26mg/dL; TARA=148.87±28.991mg/dL, P<0.000), and serum creatinine (MTZO=0.9446±0.1851mg/dL; TARA=0.8673±0.1152mg/dL, P<0.002). Creatinine levels over 0.7mg/dL for children 2-9 years old, and over 1.0 for children 10-17 years old were considered elevated, using this criteria more Mestizo boys and girls were at risk of kidney dysfunction, as compared with Tarahumara (MTZO-FEM=57.1%; MTZO-MALES=69.2%; TARA-FEM=24.4%; TARA-MALES=40.7%). Seven Tarahumara, and 25 Mestizo children showed skin discoloration, associated to malnutrition. BMI-based classification showed 20.6% normal children (n=29; MTZO=7, TARA=22), whereas Severe thinness was observed in 32.4%(n=46; 17MTZO, 29TARA) of children, Moderate thinness 24.1%(n=34, 11MTZO, 23TARA), Mild thinness 16.3%(n=23, 5MTZO, 18TARA), Pre-obese 3.5%(n=5, 2MTZO, 3TARA), and Obese Class I 2.8%(n=4, 4MTZO, none TARA). Risk for cardiac disease based on TA was 9.19%MTZO and 22.52%TARA, whereas 58.8%MTZO, and 62.5%TARA reached level 2-3 for BIP test.

Conclusions: Evidence of elevated creatinine and risky TAs for both tarahumara and mestizo children living in poverty suggest an early kidney dysfunction. Skin discoloration, low endurance and thinness indicated malnutrition. Heath supervision is needed.
Independent mobility in relation to energy intake in schoolchildren

Authors: Paula Santos, Andreia Pizarro, Jorge Mota, José Ribeiro, Elisa Marques

Purpose: Children’s independent mobility may correlate with physical activity; however it may also expose them to more sweet and fast food shops, potentially explaining the caloric intake in young people. This cross-sectional study investigated whether independent mobility is preadolescents was related to caloric intake.

Methods: Six hundred and thirty six 10-15 years old boys and girls children were recruited from 10 schools in a large Portuguese city between September 2010 and July 2011. Measures included a scale for independent mobility using eleven questions which were part of a self-completed questionnaire (reduced to one dimension using Categorical principal components analysis, Cronbach alpha = 0.901), the 24h dietary recall for the assessment food intake, accelerometer-based (ActiGraph GT1M; ActiGraph, FL, USA) moderate to vigorous physical activity (MVPA), height (m) and weight (kg), and pubertal status (Tanner stages). Body mass index (BMI) was calculated (weight in kg divided by height in meters squared).

Results: Boys had greater independent mobility, calories intake, and MVPA (average minutes per day) compared to girls. In linear regression analyses (adjusting for age, sex, MVPA, pubertal status and BMI) higher scores for independent mobility were significantly (p = 0.013) related to higher calories intake.

Conclusions: The opportunity for children to move around in their neighborhood unaccompanied by an adult appears to be an important independent correlate of calories intake for preadolescent boys and girls. Therefore, independent mobility while in part may promote spontaneous PA, the net result may be null if food intake increase.
Evaluation of “Creature-101”- A Theory based Virtual Reality Serious Game For Promoting Healthy Eating And Physical Activity Behaviors Among Middle-School Students.

Authors: Pam A Koch, Heewon Lee, Isobel R Contento, Ana Islas, Dan Fu, Dalia Majumdar

Purpose: The purpose of this research is to evaluate the outcomes of playing a virtual reality game “Creature-101” on students diet, physical activity and mediators of behavior change.

Methods: This single group pre and post-test study is a preliminary analysis of a randomized trial. 106 students (80% Hispanics), age 11-13yrs played Creature-101 in classroom 2 days/week for 1-month (7-sessions; 30-minutes each). Creature-101 uses social cognitive and self-determination theories as framework through creature care in a virtual world “Tween”. Students learn scientific evidence that promotes energy balance by playing mini-games, viewing educational videos, slideshows and interactive dialogues with game characters. Students also assess their own behaviors; create own “real life” food and activity action plans, and report their progress. Self reported online pre-post surveys measured frequency of sweetened beverages, water, processed packaged snacks (e.g. chips, candy, baked foods), fruits and vegetables, sedentary and physical activity and amounts of the targeted behaviors, as well as mediators of behavior change (knowledge, self-efficacy, outcome-expectations, autonomous motivation). Data was collected at baseline and immediately after intervention.

Results: Paired t-tests compared pre and post-test means. Students reported decreased frequency of sports drinks (Mean: 1.73-1.38, p=0.049), chips (2.78 -2.40, p=0.034), chocolate candies (2.64-2.06; p=0.002), watching television (3.72-3.10; p=0.000), playing video games (3.23-2.70; p=0.01) and size of chocolate candies (1.87-1.67; p=0.052), baked foods (1.82-1.62; p=0.048), and time watching television (3.42-3.01; p=0.010). No changes observed for mediating variables.

Conclusions: Playing Creature-101 may improve diet and physical activity behaviors among middle-school students. The results have to be confirmed after completion of the randomized trial.
**LB: CHILD PHYSICAL ACTIVITY**

**LB-201**

**Promoting physical activity in children: Preliminary Results from the Healthy Homework study**

Authors: Julia C McPhee, Scott Duncan, Kate White, Deborah J MacRae, Caryn Zinn, Grant Schofield

**Purpose:** Despite evidence that children are more active at school than at home, physical activity interventions that focus on the home environment are relatively uncommon. The Healthy Homework program (currently underway) aims to increase children's physical activity at home through a compulsory and applied homework curriculum.

**Methods:** The Healthy Homework program consists of an eight-week homework module supported by an integrated teaching unit. In total, 800 children from 20 New Zealand primary schools (10 intervention, 10 control) will participate in the evaluation between 2011 and 2012. Physical activity will be monitored before and after the intervention using sealed multiday memory pedometers over five consecutive days. School and out-of-school activity will be compared by assigning two pedometers to each participant. Preliminary results from the first six schools (n = 213) are presented here.

**Results:** Analysis of variance (adjusted for regression to the mean) revealed positive intervention effects for out-of-school activity on weekdays (780 steps, 95%CI: 50, 1,520, P = 0.038) and for weekend activity (1,580 steps, 95%CI: 250, 2,920, P = 0.021). No significant intervention effects were observed for school activity.

**Conclusions:** The Healthy Homework study is one of the first studies internationally to examine the efficacy of a compulsory homework syllabus on children's physical activity. Preliminary results suggest that the program is achieving its aim of increasing children's physical activity in the home environment.
Parents’ perspectives on the design and content of a physical activity and screen-viewing parenting programme

Authors: Russell Jago, Joanna Steeds, Georgina Bentley, Simon J Sebire, Patricia Lucas, Kenneth R Fox, Sarah Stewart-Brown, Katrina Turner

Purpose: The current study was formative work conducted to design a new parenting programme to increase children’s physical activity (PA) and reduce screen-viewing (SV). The research identified parent reported preferences for course content and design of a PA/SV parenting course.

Methods: Semi-structured telephone interviews were conducted with thirty two parents (29 female) of 6-8 year old children. Data were analysed thematically.

Results: Parents were interested in a parenting course because they wanted ideas to help their children be active and general parenting guidance. Parents indicated that they would benefit from knowing how to quantify their child’s PA and SV levels and what levels were appropriate. Parents wanted practical ideas of alternatives to screen-viewing. Most parents would be unable to attend unless childcare was provided. Schools were perceived to be a trusted source of information and the optimal recruitment location. In terms of delivery style, the majority of parents would prefer a group-based approach that provides opportunities for peer learning and support with professional input.

Conclusions: There is an interest in a PA/SV parenting courses but the provision of child care is essential. Recruitment to parenting courses is likely to be facilitated via trusted sources. Parents want practical advice on how to overcome barriers and suggest provided in a mutually supportive group experience with expert input.
Correlates of Body Mass Index and Aerobic Fitness in Adolescents

Authors: Erin E. Centeio, Hildi M. Nicksic, Jessica Duncan Cance, Darla Castelli

**Purpose:** Increased incidences of adult-type disease such as Type II diabetes during youth justify examination of associated risk factors. Accordingly, the purpose of this study was to identify the correlates of Body Mass Index (BMI) and cardiorespiratory health of adolescents residing in the Midwest.

**Methods:** Data were collected from a school-based, cross-sectional sample of adolescents aged 14-18 (N=1907; 50% female; 81% White). Variables associated with health-related fitness (Fitnessgram; Cooper Institute), physical activity (3-day recall; Weston et al., 2002), attitude toward physical activity (Motl et al., 2002), and demographic information were collected during physical education classes, after obtaining parental consent.

**Results:** Two logistic regression models were run in SAS 9.2. Controlling for gender, grade, race/ethnicity, and receipt of free or reduced lunch, adolescents with higher scores on muscle fitness (sit up and push up tests) and flexibility (sit and reach test) had a higher likelihood of being in the Healthy Fitness Zone for both BMI and cardiorespiratory health. Self-reported weekday physical activity was associated with a higher likelihood of being in the Healthy Fitness Zone for BMI, while having positive attitudes towards physical activity were associated with a higher likelihood of being in the Healthy Fitness Zone for cardiorespiratory health.

**Conclusions:** Physical activity leaders should attempt to provide opportunities to increase weekday physical activity and muscle fitness to decrease BMI and increase cardiorespiratory health. These findings are consistent with the national physical activity guidelines for youth and NASPE physical education content standards.
Prospective BMI and WC category change associated with cardiovascular fitness change

Authors: Tom Baranowski, Tzu-An Chen, Jason A Mendoza, Teresia M O’Connor, Janice C Baranowski, Russell Jago

Purpose: Test the relationship of change in body mass index (BMI) (from 6th to 8th grade) with change in cardiovascular fitness (CVF), baseline BMIz-score and CVF; and extend these findings to waist circumference (WC).

Methods: 3,998 (92%) children in the HEALTHY trial provided complete data at the beginning of 6th and end of 8th grades. Height, weight and WC were assessed according to standardized protocol. CVF was measured using the 20 meter shuttle run. Changes in BMI were categorized into five groups: increased a BMI category, stayed obese, stayed overweight, stayed healthy weight, and decreased a BMI category. WC was trichotomized in 6th and 8th grades with similar change categories. Data were analyzed separately by gender, controlling for race, parental education, pubertal stage, and baseline CVF.

Results: Youth who lowered their BMI category or remained in the healthy or overweight categories had significantly larger increases in CVF, than the stayed obese or increased a category groups. Staying obese was associated with the highest baseline BMIz-score, with the second highest among those who decreased a BMI category. BMI category change accounted for the most variance in baseline BMIz-score, followed by baseline CVF, and CVF change. 13% increased, and 13% decreased, a WC category from 6th to 8th grades, with findings similar to BMI for other variables.

Conclusions: Changes in BMI and WC categories were substantially more strongly related to 6th grade values of body size than to CVF changes. Since pre-existing adiposity inhibits adiposity change, changes in CVF and adiposity should be attempted prior to middle school.
An Objective Assessment of Physical Activity Levels Among Latino Children in London, Canada

Authors: Gillian Mandich, Shauna Burke, Anca Gaston

**Purpose:** Latino children are disproportionately affected by overweight and obesity; approximately 27% of Latino children in the United States have body mass indices (BMIs) = 95th percentile for their age and sex (Ogden et al., 2007). Although U.S. studies indicate that Latino children engage in less moderate-to-vigorous physical activity (MVPA) than any other ethnic group (Butte et al., 2007), little is known about the PA levels of Latino children in Canada. The purpose of the present study was to objectively assess (via accelerometry) the PA levels of Latino children (aged 10-14) in London, Ontario, Canada.

**Methods:** Sixty-four children (50% male; M age = 11.4 years, SD = 1.3) wore an Actical® accelerometer for 4 consecutive days (including 2 weekend days). Kinesoft custom software was used to categorize the raw data as sedentary, light, or MVPA using validated age-specific cut-points.

**Results:** On average, children spent 53 minutes (SD=34) engaged in MVPA per day. The majority (82%) of MVPA was sporadic (< 10 continuous minutes) and occurred in the afternoon (24 minutes, SD=16). Children engaged in 165 minutes (SD=47) of light activity and 498 minutes (SD=94) of sedentary pursuits daily. There were no significant differences between MVPA during week (53 minutes, SD=35) and weekend days (54 minutes, SD=41), or between boys and girls for any of the PA variables.

**Conclusions:** Results will be discussed in relation to: (a) the physical activity levels of Canadian children in general; and (b) the current physical activity guidelines for Canadian children (Tremblay et al., 2011).
Perceptions of neighborhood environment and older adults’ sitting time

Authors: Susana Carrapatoso, Joana Carvalho, Elisa Marques, Jorge Mota, Paula Santos

**Purpose:** Recent evidence suggests that sitting time, which is common in the elderly, may have a detrimental effect on health independent of low levels of physical activity. To inform interventions, correlates of prolonged sitting time need to be identified. The neighborhood is an important context for older people’s physical activity and inactivity patterns since this group tends to spend more time in local environments. The aim of this cross sectional study is to investigate associations between perceptions of the neighborhood environment and sitting time among older adults.

**Methods:** Participants were 140 community-dwelling adults average aged 69.4 (SD= 6.7) years, 74.3% were women. Physical activity was assessed using the IPAQ short form, which have an additional item to assess sitting: During the last 7 days, how much time did you usually spend sitting on a weekday? Perceptions of the neighborhood environment were assessed with ALPHA questionnaire. All questionnaires were completed in a face-to-face semi-structured interview.

**Results:** The median reported sitting time was 231.2 (SD 128.3) minutes/day. In linear regression analyses (adjusting for sex) higher amount of sitting time was significantly (p < 0.05) related to perceptions that traffic makes difficult or unpleasant to walk in the neighborhood.

**Conclusions:** Perceptions of neighborhood environment may also play an important role in influencing sitting time among older adults. Since the effects of prolonged sitting time on health risks, are independent of physical activity, interventions might consider modifiable neighborhood attributes that contribute to sitting time.
Contextual overview of physical activity resources in a health disparate region

Authors: Clarice N Chau, Lauren Sams, Korine N Kolivras, Jennie L Hill

Purpose: Utilizing a CBPR process, community members identified six causal models for obesity including environmental influences and physical inactivity. The purpose of this research is to determine the availability and quality of the physical activity (PA) resources available to residents.

Methods: Block-group socio-demographic data was utilized from U.S. Census data. PA outlets were mapped using ArcGIS. Pairs of trained auditors determined the quality of outlets using the PARA tool.

Results: There are 39 PA outlets across 26 block groups, of which 43% were parks, 26% were schools, and 18% were recreational centers. White block groups had more outlets (N=21; free=14) available compared to Black block groups (N=13; free=9). The mean features and amenities by outlets did not differ by block group race, however the incivilities per outlet in Black block group was higher (M=3.15) than in White block groups (M=1.67).

Conclusions: With already low resources to PA, it is evident that these outlets are not equally distributed among the block groups with higher minority populations. Schools were included in the analysis to encompass a potential larger variety of PA outlets; exclusion of these outlets would reduce the sample by a quarter. However, we did not determine the availability of schools for public use, therefore exploring shared-use agreements with this community may be important.
Dietary patterns of Indigenous children compared to non-Indigenous children in remote areas of the Northern Territory of Australia

Authors: Debra Gent, Natalie Sinn, Patrick Cooper, Kerin O’Dea

Purpose: This study examined dietary patterns of remote and very remote Indigenous school children and how these patterns relate to the Australian Dietary Guidelines, the National Nutrition Survey and non-Indigenous school children from the same region.

Methods: This study was conducted as part of an omega-3 intervention being undertaken in 4 schools in the Northern Territory of Australia. Dietary patterns were assessed using a specifically designed food frequency questionnaire (FFQ) which included pictures and examples of portion sizes for the children to self-report. 112 Indigenous children were recruited, average age 10.11 ± 1.23 years, and 26 non-Indigenous children, average age 10.20 ± 1.44 years.

Results: Subscales of the FFQ showed good distributions, with skewness and kurtosis statistics within acceptable limits. Overall, 77.7% of Indigenous children were meeting the recommended 2 serves fruit/day compared to 69.2% non-Indigenous (likely due to fruit provided at school). Only 22.4% of Indigenous children were consuming the recommended 3 or more serves of vegetables daily, compared to 26.9% non-Indigenous. Indigenous children consumed significantly more takeaway foods (p=0.000), sugared drinks (p=0.025) and fish (p=0.021) and significantly less water (p=0.000) than their non-Indigenous peers.

Conclusions: Indigenous children were consuming significantly more ‘extra’ foods than their non-Indigenous peers, and weren’t meeting dietary guidelines for fruit and vegetable consumption. This is of particular interest because both samples came from the same regions with access to the same food outlets and is a likely contributor to poorer health outcomes in Indigenous Australians, highlighting the need for education programs targeting this at-risk group.
Does walking proximity to resources predict physical activity in a health disparate region?

Authors: Clarice Chau, Lauren Sams, Korine N Kolivas, Jennie L Hill

Purpose: Although the body of literature supporting a relationship between the built environment and physical activity continues to grow, few studies examine small cities or rural areas. Through a community-academic partnership, the objective of this research is to determine the relationship between proximity of physical activity outlets and physical activity (PA) behaviors in a health disparate region.

Methods: All PA outlets were objectively audited using the physical activity resource assessment (PARA) tool. Self-reported individual PA behavior was collected via a telephone survey using validated measures. A 400-M buffer was drawn around each individual respondent to quantify the number of outlets within walking distance that could be of potential use.

Results: A total of 39 PA outlets were audited and 269 residents responded to the survey of which 51% are sedentary. Only 27% of residents had at least one outlet within walking distance. Using logistic regression, living within walking distance was not statistically significant in predicting physical activity behavior.

Conclusions: Despite not having statistical significance, there is still practical significance. Less than one-third of the sampled population lives within walking distance of a PA resource. This information will be disseminated back to the community and to guide future initiatives to provide more available and accessible resources to residents.
How important is the home neighbourhood in terms of adult’s overall physical activity levels? A study using Global Positioning Systems

Authors: Emma Coombes, Melvyn Hillsdon, Andy P Jones, Pippa Griew, Paul Wilkinson, Shakoor Hajat

**Purpose:** Environmental characteristics of home neighbourhoods are hypothesised to be associated with residents’ physical activity levels, yet many studies report only weak associations. The FAST study is combining Global Positioning Systems technology (GPS) with accelerometry in UK adults to measure actual locations that physical activity takes place in. We evaluate whether defining home neighbourhoods based on ‘walkable’ distance buffers around the home best captures environmental characteristics that influence behaviours.

**Methods:** 1084 adults from Northwest England took part. Each participant’s activity levels were recorded for 7 days using an accelerometer. A quarter of our participants also wore a GPS device. The accelerometer and GPS data were integrated into a Geographical Information System (GIS) containing information on the participants’ home locations. We then examined the distance from home that participants undertook their moderate to vigorous physical activity (MVPA) and the environments they used.

**Results:** We found that over half of MVPA was undertaken further than a 10 minute walk from the participant’s home location, and 75% of MVPA took place more than 2 km from home. Our findings suggest that key locations away from home, such as place of work or commercial districts, appear to be more important than the home neighbourhood.

**Conclusions:** These findings suggest that delineating neighbourhoods based on walkable distance buffers around the home may inadequately capture the range of environments where physical activity takes place. In order to fully evaluate the role of built environment characteristics on physical activity behaviours, the wider geographic context must be considered.
LB: INFANT NUTRITION

LB-211

The Relationship between Maternal Feeding Responsiveness and Infant Growth Trajectories

Authors: Eric A Hodges, Todd A Schwartz, Margaret E Bentley

Purpose: Purpose: A chronic mismatch between a caregiver’s feeding behavior and the infant’s state of hunger or fullness has been proposed to contribute to childhood obesity. Yet due to a lack of longitudinal studies we know nothing about patterns of maternal feeding responsiveness (MFR) during infancy. This study aims to characterize these patterns in relation to growth trajectories.

Methods: Methods: A secondary analysis was performed on a dataset of first time, low-income African-American mother-infant pairs assessed at infant age 3, 6, 9, 12, and 18 months. A subsample starting above 85% (weight-for-length) and going below (n = 12), starting below 85% and going above (n = 12), and staying between 30-70% (n = 10) was selected. MFR (1 [highly unresponsive] to 5 [highly responsive]) was assessed using the Responsiveness to Child Feeding Cues Scale. Covariates included infant weight-for-length Z score, fussiness, and sex, and maternal depression, BMI, and breastfeeding duration. Using a random intercepts, mixed-effects, polynomial linear model, differences in MFR were tested over consecutive time points.

Results: Results: For responsiveness to eating receptiveness, no significant differences among growth trajectory groups or overall were found. For responsiveness to fullness cues, growth trajectory groups differed significantly in both unadjusted, $F(103) = 2.72, p = .009$ and adjusted models, $F(87) = 2.51, p = .017$.

Conclusions: Conclusions: These findings provide new insight into the relationship between maternal responsiveness to infant fullness cues and infant growth trajectories and thereby highlight a potential target for early interventions to affect weight-for-length growth.
LB: MEDIA IMPACT ON NUTRITION

PERCEPTION AND MEDIA-RELATED INTERVENTION STRATEGIES TO ADDRESS OBESITY AMONG HISPANIC COMMUNITIES

Authors: Roger Figueroa, Erica Sosa, Alberto Cordova, Summer Wilmoth, Timothy Jones, Sa Wu, Meizi He

Purpose: The study aim was to qualitatively explore the perception of obesity and identify media-related strategies to address obesity in Hispanic community.

Methods: This qualitative study involved in-depth interviews with a purposeful sample of Hispanic adults in Texas, USA. Sixteen interviews were conducted using a semi-structured guide, audio-taped and transcribed verbatim. Inductive content analysis was used to identify themes.

Results: Participants were aware of the severity, consequences and contributing factors of obesity in the Hispanic community. Media, especially TV and Internet were the primary information sources with both positive and negative impacts on the communities regarding obesity-related health issues. Participants suggested media-related strategies including regulations on junk food commercials; frequent public health announcements and healthy messaging; role modeling; and fat body imagery to help the community recognize the seriousness of obesity.

Conclusions: Hispanic residents were concerned with obesity and were able to provide potential solutions to address this health problem. Spanish media represents a potential resource to inform, educate and motivate the Hispanic community to live a healthier lifestyle and thus reduce the risk of obesity and diabetes. Future media-related obesity prevention strategies should focus on frequent public health announcements of local government initiatives, programs and events; role modeling for healthy lifestyle; educating community in recognizing obesity issues; as well as the effect of “fat body imagery” on Hispanics’ weight perception and advocating for regulations on junk food commercials. Also, future research using a quantitative approach is needed to confirm the finding from the current qualitative study.
Structured critique for the formative testing phase of a multi-level behavioral intervention

Authors: Cindy Robert-Gray, Margaret E Briley, Deanna M Hoelscher, Sara J Sweitzer, Courtney Byrd-Williams

Purpose: To demonstrate use of structured critique for identifying adaptations needed in intervention and/or implementation materials prior to initiating an efficacy trial.

Methods: A diverse team of 7 study investigators, staff, and students spent one hour in structured critique of the childcare center based multi-level Lunch is in the Bag intervention aimed at improving sack lunches parents pack for their preschool children. The intervention consisted of 6 weeks of newsletters, free-standing parent-child learning stations, and classroom activities. After 10 minutes of browsing the 6 tables of materials, team members chose their personal “favorite week,” spent 10 minutes reading and interacting with all materials for that week, and completed a questionnaire to evaluate the materials and estimate proportion of implementers and participants likely to engage as intended. The process was repeated for “least favorite week.” Review of results and consensus about how to handle items of concern closed the critique.

Results: All but one of the 6 weeks was selected as “favorite” by at least one reviewer. Only 2 weeks were “least favorite” and were noted in discussion as having content at a higher level of challenge (e.g., food labels). Newsletters, stations, and classroom activities received comparable endorsements. Estimates of users likely to engage averaged 40%, 68% and 64% for newsletters, stations and classrooms, respectively. Consensus was that materials were ready for trial but training for center personnel should address items of concern.

Conclusions: Team critique is an inexpensive but useful strategy for formative testing of interventions.
LB: OCCUPATIONAL HEALTH

LB-214

Getting Healthy for the Holidays: Results from a worksite wellness intervention for childcare center staff in North Carolina

Authors: Phillip Hanson, Amber E Vaughn, Temitope Erinosho, Stephanie Mazzucca, Dianne S Ward

Purpose: To evaluate the feasibility of Healthy for the Holidays, a five-week worksite wellness pilot intervention for childcare staff.

Methods: Participants were a convenience sample of 17 staff from three childcare centers in North Carolina. The five-week intervention commenced on November 12, 2011 with an educational workshop and health assessment, and included daily monitoring of target health behaviors and the weekly provision of feedback to participants by the research team. Baseline measures included height and weight used to calculate body mass index (BMI), physical activity measured as steps/day (pedometer data from week 1), self-reported servings of fruit, vegetables, and sugar-sweetened beverages consumed daily, and smoking. Outcome measures were reassessed at week 5 by self-report. Participants completed a program evaluation at the end of the study. Means and standard deviations were calculated to evaluate differences between pre- and post-intervention outcome measures.

Results: On average, participants lost 4.2±3.8 pounds, and BMI decreased by 0.8±0.6 kg/m². Daily physical activity increased by 3,197±3,040 steps/day. Self-reported intake of fruits and vegetables increased by 2.1±1.9 servings/day, while sugar-sweetened beverage consumption decreased by 0.7±1.7 servings/day. Among smokers, smoking decreased by 6.2±10.3 cigarettes/day. Of the 16 participants who completed the program evaluation, 14 (88%) said the program was very helpful for changing nutrition and physical activity habits, and 15 (94%) said they would participate in such a program again.

Conclusions: Although based on a small sample, the pilot intervention showed encouraging trends in all target areas and received enthusiastic support from participating childcare providers.
LB: PHYSICAL ACTIVITY AND NUTRITION METHODS AND MEASURES

LB-215

Moving Beyond “Counts” to Assess Engagement with Interventions in Process Evaluations

Authors: Christine Olson, Keriann H. Paul

Purpose: To evaluate the impact of the quantity and quality of engagement with a newsletter-based healthy lifestyle intervention on risk of excessive weight gain during pregnancy.

Methods: 183 healthy, adult, normal and overweight pregnant women were followed from early pregnancy until 1 year postpartum in a prospective cohort study. Women received 5 newsletters over the course of pregnancy through the US mail. Newsletters included a postcard on which women were asked to set a goal for behavior change related to newsletter topics. The quantity of engagement was defined by the number of completed postcards returned and the quality by the appropriateness of the goals set. Weight and height data were abstracted from the prenatal medical record. Multivariate logistic regression analysis assessed associations between engagement and the proportion of women with excessive pregnancy weight gain.

Results: 49.2% (90/183) of women returned 4 or 5 postcards, defined as a high level of engagement. This variable was not significantly associated (p >0.05) with pregnancy weight gain. 42.1% (77/183) set some or many appropriate goals, defined as high-quality engagement. The association between quality of engagement and excessive pregnancy weight gain approached statistical significance (69.2% vs. 37.7%, p = 0.07). The odds of excessive pregnancy weight gain was OR= 0.15 (95% CI=0.03, 0.70) among women achieving a high quantity and quality of engagement compared to those who did not.

Conclusions: Process evaluations need to go beyond considering dose (quantity of participation) and include assessments of the quality of engagement with interventions.
Posters

LB-216

Reproducibility of NutriGram—a new instrument to measure nutrition knowledge and lifestyle behaviors of elementary school children.

Authors: Naomi E Chen, Shreela V Sharma, Carolyn L Smith, Nancy Beasley, Paige Abernathy, Deanna M Hoelscher

Purpose: The purpose of this study was to assess the reproducibility of NutriGram, a self-report, web-based questionnaire developed by The Cooper Institute consisting of 1) Making Healthy Choices-1 (MHC-1) survey with 47 items measuring nutrition, physical activity and sedentary behaviors, and 2) Nutrition Challenge (NC) survey with 28 items measuring nutrition knowledge. To date, few instruments include questions about breakfast and school lunch nutrition-related behaviors.

Methods: MHC-1 (n=149) and NC (n=175) were administered twice, 15.4+ 3.4 and 15.7 + 3.9 days apart, respectively, to a multiethnic population of children grades 3-5 in 11 cities in Texas, USA. Kappas and percent agreement were computed.

Results: MHC-1 and NC participants were primarily female (54% and 54%, respectively) and Hispanic (49%, 41%). Approximately equal numbers of students participated from each grade (third: 29%, 41%; fourth: 42%, 41%, fifth: 30%, 26%). For MHC-1, 25 of 47 (53%) items had >75% agreement, and kappa>0.4. Of NC items, 16 of 28 items (57%) had >75% agreement, and 39% had kappa>0.4. Questions with the strongest test-retest reliability were those for sedentary behaviors, meal consumption patterns, and where meals were consumed. Subgroup analysis showed gender differences for sedentary and meal consumption behaviors and ethnic differences for lunch menu choices with females, non-Hispanics and fifth graders demonstrating stronger reliability scores.

Conclusions: Most NutriGram questions have fair to good reliability for assessment of dietary behaviors and attitudes and are consistent with the findings of other measurement tools for this age group. NutriGram is readily available for implementation to school districts nationwide.
Using GPS and Accelerometers in a Regional Travel Survey to Evaluate Physical Activity and Health

Authors: Leslie Meehan, Michelle R Lee, Jean Wolf

**Purpose:** The Nashville Area MPO plans to collect robust baseline data on the physical activity and health of persons in their region as part of the 2012 regional transportation survey. The goal is to be able to quantify the effect that including health and safety criteria in the evaluation and ranking of future transportation projects (required in the 2035 Nashville Area Regional Transportation Plan) has on the overall health of Nashvillians.

**Methods:** A health and physical activity component has been added to the Nashville Regional Transportation Survey; this health and physical activity component will include 1000 persons in the region to be instrumented with a GPS and accelerometer for four consecutive days. The data collected by these devices, along with the data from a health questionnaire (administered after GPS/accelerometer data collection), will then be evaluated in tandem with existing GIS data from the region to evaluate and analyze the effect of the built environment on the health and physical activity of participants.

**Results:** The pilot study conducted in February of 2012 (main study in progress) proved that GPS and accelerometer technologies work very effectively at collecting good, precise information about where, when and at what intensity physical activity occur. The health questionnaire collected related details and perceptions from study participants.

**Conclusions:** Including a health and physical activity component in a large-scale regional travel survey is feasible and advantageous. Using GPS/accelerometers for data collection provide a robust dataset which has great value to both transportation and health researchers.
The International Physical Activity Questionnaire (IPAQ): a study of concurrent and construct validity in Sri Lanka

Authors: Jentrick Bena Archuthan, Rathanayake Malkanthi

Purpose: Accurate measurement of physical activity (PA) is a pre-requisite for monitoring population health and for evaluating effective interventions. The IPAQ is used as a comparable and standardized self-report measure of habitual physical activity of populations from different countries and socio-cultural contexts. The aim of the present study was to evaluate the concurrent and construct validity of the IPAQ in a Sri Lankan sample of adult adults.

Methods: Fifty voluntary healthy male (n = 32) and female (n = 18) subjects (age, mean 28.3 SD 7.6 years) participated in the study. PA indicators derived from the IPAQ-L were compared with continues 24 hour period data from an activity monitor accelerometer for concurrent validity, and with BMI and percentage body fat for construct validity.

Results: Strong positive relationships were observed between the activity monitor data and the IPAQ data for total PA (r = 0.55, P < 0.01) and vigorous PA (r = 0.59, P < 0.01), but a weaker relationship for moderate and light PA (r = 0.41, P < 0.05). A strong negative relationship was observed between IPAQ data for total PA and body fat (r = -0.58, P<0.01). A moderate negative relationship was observed between IPAQ data for total PA and BMI (r = -0.38, P<0.05). Bland–Altman analysis suggested that the inability of activity monitors to detect certain types of activities might introduce a source of error in criterion validation studies.

Conclusions: The long IPAQ questionnaire has acceptable validity when assessing levels and patterns of PA in healthy adults in Sri Lanka.
Feasibility Study in the Implementation of a Physical Activity Guide Among Elementary Schoolchildren in Two Public and Two Private Schools

Authors: CELESTE C TANCHOCO, MARILOU L MADRID, Noelle Lyn C Santos, Consuelo L Orense, Edward Vincent J Magtibay, Merlyn G Tajan

Purpose: This study was done to evaluate the effect of the physical activity guide (PAG) on the weight, physical fitness levels, PA awareness and habits of schoolchildren in two public and two private elementary schools in Manila, Philippines.

Methods: The PAG containing illustrated exercises and messages were developed and placed strategically in the schools. Monitoring and recording of the duration and time period of PAG implementation were done by trained researchers and selected students for three non-consecutive school days for at least 16 weeks. Collection of weight, and fitness tests like push-up, curl-up, trunk lift, sit and reach, shoulder stretch were done at baseline and endline periods. PA awareness and habits of schoolchildren, parents and teachers were also assessed using a questionnaire.

Results: The median percentage of PAG implementation was about 50%. The mean duration of PA was about 11 minutes per day. The median weight and all fitness tests scores improved significantly after PAG implementation. The schoolchildren were generally aware of PAG and enjoyed PA in school. Both the teachers and parents observed that the children not only enjoyed the PAG lessons but felt that the PAG helped improved PA habits of the children. The schoolteachers were the source of information on PA.

Conclusions: While PAG was not regularly implemented in the four schools, a general improvement on weight and physical fitness was observed among schoolchildren. Parents and teachers reported positive changes on children’s PA habits in the school and at home.
Self-report use-of-time tools for the assessment of physical activity and sedentary behaviour in young people: Systematic review

Authors: Louise Foley, Ralph Maddison, Timothy S Olds, Kate Ridley

Purpose: Regular physical activity and limiting extended periods of sitting are two behaviours critical for the prevention of obesity in young people. The aim of the systematic review was to synthesise the psychometric evidence for self-report use-of-time tools that assess these behaviours. This is the first review of its type.

Methods: A systematic literature review was conducted. Articles were retrieved that reported reliability and/or validity for use-of-time tools in participants aged 18 years or under. Outcome variables were physical activity, sedentary behaviour and energy expenditure. Study quality was appraised, and the results summarised narratively.

Results: Sixteen studies and six different tools were identified. The tools were the Previous Day Physical Activity Recall, the Three Day Physical Activity Recall, the Physical Activity Interview, the Computerised Activity Recall, the Activitygram and the Multimedia Activity Recall for Children and Adolescents. Overall, tools indicated moderate validity compared with objective and criterion comparison methods. Generally, validity correlation coefficients were in the range of 0.30 to 0.40. Correlation coefficients for test-retest reliability ranged widely from 0.24 to 0.98.

Conclusions: Use-of-time tools have indicated moderate reliability and validity for the assessment of physical activity and energy expenditure. Future research should focus on using criterion methods and on validating specifically for sedentary behaviour outcomes. Implementation of these tools for population surveillance should be considered.
LB-221

Physical activity guidelines for health: How valid are the Godin-Shephard Leisure-Time Physical activity Questionnaire and the International Physical Activity Questionnaire-Short Form?

Authors: Steve Amireault, Gaston Godin

Purpose: To assess the reliability and validity of the Godin-Shephard Leisure-Time PA Questionnaire (GSLTPAQ) and the International PA Questionnaire- short form (IPAQ-SF).

Methods: Members of a fitness center (N = 101; 44.1% female; mean age = 45.5 ± 10.4 years; mean BMI = 25.4 ± 3.8 kg/m2) agreed to a visit in the laboratory where they completed both questionnaires. Percentage of body fat (%BF; skinfold measurements) and VO2max (Astrand-Rhyming sub-maximal testing) were assessed and used to classify participants as active or insufficiently active in reference to PA guidelines. Two weeks latter, questionnaires were sent by mail to assess temporal stability.

Results: There were 61.3% and 86.0% of the participants classified as “active” according to the GSLTPAQ and IPAQ-SF, respectively. Cohen’s kappa [95%CI] was 0.40 [0.21, 0.60] for the GSLTPAQ and 0.38 [0.13, 0.64] for IPAQ-SF. MANCOVA, revealed that the combination of VO2max and %BF was significantly related to the GSLTPAQ’s classification (F(2,89) = 6.87; p = 0.002) whereas the IPAQ-SF’s classification did not reach significance, with (F(2,88) = 1.70; p = 0.19) and without consideration of the walking score (F(2,88) = 2.70; p = 0.07). Based on the GSLTPAQ’s classification, adjusted means VO2max for “active” and “insufficiently active” individuals were 40.5 [38.1, 42.9] and 34.8 [31.6, 38.0] mLO2 • kg-1 • min-1, respectively (pdiff = 0.0006) whereas the adjusted means %BF were 28.5 [27.5, 29.6] and 30.0 [28.6, 31.4] %, respectively (pdiff = 0.03).

Conclusions: The GSLTPAQ’s is a valid tool to classify adults into active and insufficiently active subgroups.
Validity of the activPAL in estimating moderate to vigorous physical activity in free-living conditions

Authors: Corianne Oliver, Kate Lyden, Patty Freedson

Purpose: The activPAL (AP) monitor is well established as a valid monitor for distinguishing sitting, standing and stepping time. The purpose of this study was to determine the validity of the AP compared to a criterion of direct observation (DO) in estimating time spent in moderate to vigorous physical activity (MVPA) under free-living conditions.

Methods: Thirteen participants (mean ± SD: age 24.8 ± 5.2yr, BMI = 24.8 ± 4.2kg·m⁻²) wore the AP and were directly observed for one 10-hr period. During this time a trained researcher directly observed and recorded participant behavior in a personal digital assistant programmed with custom software to document activity mode, intensity and duration. Total time in MVPA according to DO was determined by summing the time in behaviors = 3 METs. The AP estimates energy expenditure from a prediction equation based on stepping cadence and activity duration. A linear mixed effects model was used to assess the average difference (bias) between AP and DO estimated MVPA. Significance was determined from the 95% CI of the bias: if the 95% CI spanned zero, the AP estimate was not significantly different than DO.

Results: On average, the AP slightly underestimated MVPA (bias (95% CI) = -0.67 min (-6.52-5.18), RMSE: 9.9 min) over the 10-hr DO period, which was not significantly different than DO.

Conclusions: AP accurately predicted time in MVPA in free-living conditions. In addition to accurately measuring time spent in sedentary and light activities, the AP is a valid tool for measuring time spent in free-living MVPA.
Comparison between the International Physical Activity Questionnaire (IPAQ-long) and combined accelerometry and heart rate monitoring in Greenland

Authors: Inger Katrine Dahl-Petersen, Peter Bjerregaard, Marit E. Jørgensen, Andreas Wolff Hansen, Soren Brage

Purpose: Information about physical activity (PA) in Greenland is limited, partly due to a lack of validated instruments in countries with non-western living conditions. We modified the long form of the International Physical Activity Questionnaire (IPAQ-L) to arctic living conditions. The purpose was to compare IPAQ-L-estimates with combined accelerometry and heart rate monitoring (ACC+HR) in a population-based study of adult Inuit in Greenland.

Methods: Cross-sectional data collected by face-to-face interview and ACC+HR monitoring among Inuit (18+years) in Greenland during 2005–2010 (n=1510). Physical activity energy expenditure (PAEE) and time spent sedentary (SED) and at moderate and vigorous intensity (MVPA) were derived from IPAQ-L and ACC+HR. Estimates were compared using Bland-Altman agreement analysis and Spearman correlation coefficient stratified by sex, place of residence (capital, towns, and villages) and age groups.

Results: Questionnaire PAEE was moderately correlated with objectively measured PAEE (r=0.20–0.36, P<0.01). Time spent at MVPA and SED were weakly correlated (r=0.11–0.27). The Bland-Altman plots showed relatively small mean differences for all measures of PA; however, the limits of agreement were wide.

Conclusions: The IPAQ-L adapted to arctic living conditions in Greenland had a moderate level of agreement with combined accelerometry and heart rate monitoring for PAEE at population level but a high individual variability. A clearer terminology for the classification of different intensities of activity and walking pace is needed. Studies on how culture, social norms, and language affects the interpretation of PA questions is important in order to improve the validity of the IPAQ-L in an Arctic setting.
A Web-Based Physical Activity Bout Reviewer for Conducting Interviews

Authors: Jean Wolf, Michelle R Lee, Laura Wilson, Marcelo Oliveira

**Purpose:** A web-based survey tool was developed to allow immediate reviews of moderate and vigorous bouts of physical activity (MVPA) with participants who use GPS loggers and accelerometers to collect one week of data.

**Methods:** The University of Utah is conducting a physical activity evaluation of a Complete Street implementation in Salt Lake City. To support this study, GeoStats developed the Physical Activity Bout Reviewer, a web-based survey tool that leverages GPS and accelerometer data collected by study participants to display locations and time periods of detected MVPA bouts and to serve as a prompting mechanism for obtaining additional details about each bout. Survey team members, equipped with netbooks that have wireless communication cell cards which connect to the internet, download these devices and upload the datasets to the website. The GPS and accelerometer datasets are merged and processed to identify CDC-recommended MVPA bouts of activity using NHANES cut points. Then, the participant is engaged in a face-to-face GIS/GPS enhanced prompted recall interview.

**Results:** The pilot study conducted in the fall of 2011 (main study in progress) proved that this combination of technologies works very effectively at collecting good, precise information about MVPA bouts, and related details and perceptions from physical activity study participants.

**Conclusions:** Providing a computer-based survey system that provides accurate spatial and temporal details of MVPA bouts (which were collected via passive, objective measurement) immediately after data collection concludes is proving to be a very effective method for collecting accurate information about physical activity from study participants.
Field validation of secondary data sources on parks in the US

Authors: Christopher M Quinn, Kevin Gibbs, Sandy J Slater, Dianne C Barker

Purpose: Studies assessing opportunities for outdoor recreation in settings such as parks frequently use secondary data to locate and quantify these settings and to characterize disparities in access, but the validity of these data is rarely known. This study sought to assess validity of different secondary data sources overall and by urbanization.

Methods: A field validation of public parks was conducted in 150 urban census tracts in the Chicago CBSA plus 70 non-urban tracts in a 50-mile buffer area. Field teams made 1018 observations in 234 census tracts. Secondary data were acquired on park locations from USGS GNIS, Navteq, and TeleAtlas for comparison. Field observations in each tract were screened for eligibility and matched to the data sources by name and location.

Results: There were 819 eligible field observations. Preliminary unweighted analyses show the overall sensitivity rate (proportion of field observations that were listed in secondary data) was 62.2% when all data sources were combined. Among the different sources, USGS GNIS had the highest sensitivity rate. Sensitivity of the combined secondary list of parks was higher in urban areas than non-urban areas. Positive predictive value of the secondary lists and concordance will also be presented.

Conclusions: Secondary data are often assumed to be accurate without accounting for systematic list inaccuracies. We found that the quality of specific secondary data sources varied, and agreement improved when multiple sources were combined. Differences in secondary data coverage appear to exist by urbanization, which could bias results of studies relying on these data.
Development of a short food frequency questionnaire to assess the dietary pattern of pre-school children

Authors: Megan Jarman, Georgia Ms Ntani, Sarah Crozier, Hazel Inskip, Cyrus Cooper, Janis Baird, Mary Barker, Sian Robinson

Purpose: Shorter dietary assessment tools are less burdensome for participants. This study aimed to evaluate the relative validity of a 20-item food frequency questionnaire (FFQ) in assessing a dietary pattern of pre-school children.

Methods: Diet was assessed in 1640 children at age three years using an administered 83-item FFQ in the Southampton Women’s Survey (SWS), a prospective study of mothers and children in Southampton, UK. Principal components analysis of the FFQ data was used to identify dietary patterns. The key pattern was a ‘prudent’ pattern. A prudent diet score was calculated for each child; children with high scores had high consumption of fruits, vegetables and wholemeal cereals and low consumption of refined cereals and confectionery. A short 20-item FFQ was developed that included the 20 most influential foods for the prudent pattern. Forty-five SWS children had diet assessed using the full FFQ and the short FFQ, that was administered by telephone, 3-6 months later. Prudent diet scores from the short FFQ were calculated using coefficients from the full FFQ and reported consumption frequencies from the short FFQ; scores from full and short FFQs were compared using Pearson’s correlation coefficients.

Results: Prudent diet scores assessed using the short FFQ were highly correlated with scores from the full FFQ ($r=0.68$, $p<0.001$).

Conclusions: The short FFQ appears to provide useful information about compliance with the prudent dietary pattern. Using a short FFQ could be very useful for reducing participant burden, and may be particularly suited for use in hard to reach populations.
Child care center menu variety may influence staff behaviors

Authors: Ashley M Frampton, Kellie B May, Janis Campbell, Danielle R Brittain, Susan B Sisson

**Purpose:** Preschool (2-5 years) is an important age for developing healthy food preferences. With many children attending child care centers (CCC), the purpose of this study was to determine if CCC menu variety is associated with staff encouragement of children to try new/less-favorite foods.

**Methods:** A cross-sectional survey was mailed to a stratified random sample of 703 CCCs across Oklahoma. Key questions included: “Weekly menus include a combination of both new and familiar foods”; “Weekly menus include foods from a variety of cultures”; and “Children are encouraged by staff to try a new or less-favorite food.” Response categories were collapsed to “rarely/never-to-some of the time” and “most-to-all of the time”. Descriptive statistics and Chi-squared analyses examined associations between inclusion of new and familiar foods and staff behavior (aim 1) and cultural variety and staff behavior (aim 2).

**Results:** A total of 316 surveys were returned (45% response). Due to missing responses, 310 CCCs were included in aim 1, and 311 CCCs in aim 2. In CCCs where menus included combinations of new and familiar foods “most-to-all of the time,” staff were more likely to encourage children to try new/less-favorite foods, compared to CCCs that included new and familiar foods “rarely/never-to-some of the time” (p=0.021). No associations were found in aim 2.

**Conclusions:** Staff encouragement of child eating behaviors was associated with menu variety. This suggests possible upstream policy interventions for CCC directors; by including both new and familiar foods on the menu staff may be more likely to encourage children to try new/less-favorite foods.
Assessing the nutrition environment of childcare centers in Texas, USA using the Environmental and Policy Assessment and Observation (EPAO) adapted for centers with parent-provided food

Authors: Janis M Valmond, Courtney Byrd-Williams, Naomi E Chen, Sara J Sweitzer, Margaret E Briley, Cindy Robert-Gray

Purpose: About 1 million children attend childcare centers in Texas where food can be center-provided, parent-provided, or both. Center environment can influence preschooler dietary intake. The EPAO assesses the food and physical activity environment of centers that provide food. No assessment tool exists for the up to 40% of centers that require parents to send food. Therefore, this study aims 1) to adapt the EPAO to assess centers with center- or parent-provided food and 2) to describe the food provision practices in 18 child care centers in Texas, USA.

Methods: The existing EPAO was modified by researchers experienced working with centers with parent-provided food. Trained data collectors conducted all-day observations (6-12hrs) in one preschool classroom per center in San Antonio (n=8) and Houston (n=10), Texas, USA during 2011 fall semester. Study inclusion criteria required all 18 centers had parent-provided lunch.

Results: Between 2 and 5 eating occasions were offered to the children (mean=3.1). Children ate breakfast (n=6) and AM & PM snack (n=16) in the centers. Snacks were provided by parents for the whole class (13%), parents for their child (25%), the centers (56%), or a combination (6%). Snacks were served family style (16%), by staff (53%), unpacked from lunchbox (25%), or a combination (6%). Two centers had birthday celebration foods provided by parents on the observation day.

Conclusions: Observations using this first adaptation of the EPAO indicated that food provision practices across the centers varied considerably. Future research is needed to identify which environments are associated with healthier diets for preschoolers.
Authoritative parenting style can be connected to better appetite and food acceptance and higher BMI for four-year-olds

Authors: Wei Lin, Hsiao-chi Yang, Li-Tuan Chou, Jyh-Tsorng Jong, Chi-Ming Hang

Purpose: The purpose of this study was to investigate the relationship between familial and parenting factors and toddlers’ food acceptance and BMI.

Methods: This is a longitudinal study. Two hundred and fifteen parents of 2-year-old toddlers completed questionnaires once a year for 3 consecutive years. Structure equation modeling was used to test model that describe familial factors (including family’s socioeconomic status, parent’s general dietary practice, family food availability, dinning atmosphere), parenting styles (5 dimensions-authoritative, rewarding, permissive, authoritarian and restriction) on toddler’s eating behavior (include appetite and food acceptance) and BMI in the age of 2, 3, and 4.

Results: The proposed model with authoritative parenting style showed excellent fit in children of age 2 and 4. The proposed model of age 4 children indicated that toddlers’ BMI was connected to their eating behavior which was positively influenced by parent’s authoritative parenting style and positive family dinning atmosphere. The study showed that parent’s authoritative parenting style is positively connected to parent’s general dietary practice but not family’s socioeconomic status.

Conclusions: The results indicated that parents who had better general dietary practice are generally more authoritative, and therefore, their toddlers have better eating behavior (include appetite and food acceptance) which will directly result in higher BMI. However, the relationship between parenting style and children’s eating behavior and BMI may vary with age.
**LB: PRESCHOOL PHYSICAL ACTIVITY**

**LB-230**

**Impact of Childcare Center Physical Activity Policy**

Authors: Mandy E Wray, Susan B Sisson, Ashley M Frampton, Janis Campbell, Danielle R Brittain, Kellie B May

**Purpose:** A growing percentage of young children spend time in center-based childcare (CCC). CCC policies may impact (PA) practices of teachers and children. The purpose of this study was to examine associations of a written PA policy on obesogenic practices in CCCs in Oklahoma.

**Methods:** A proportionate stratified sample (n=703) of licensed CCC providing all-day care to young children was selected across Oklahoma. PA policy was self-reported by directors as written or not-written. Obesogenic practices were assessed by: duration of active play time, frequency of teacher-led activity, outdoor time, withholding play, and prolonged sitting. Also reported were TV use, access to play equipment and to outdoor and indoor spaces. Analyses included frequency and Chi-Squared.

**Results:** The frequency of Oklahoma CCC reporting a written PA policy was 51.3%. A written PA policy versus non-written (or none) was associated with: teacher led physical activity ?2/day, 78.6% vs. 65.7%, p=0.041), television use (rarely used, 66% vs., 46%, p=0.001), portable play equipment (wide variety of available equipment for all children, 66% vs. 53%, p=0.024), and indoor play space (space for all level of activity, 37% vs. 23%, p=0.009) There was no difference in practice between written and non-written policy for other variables.

**Conclusions:** Presence of a written PA policy was associated with some constructive PA practices. Inclusion of a written PA policy may positively influence the CCC environment and potentially impact PA of children and is a potential avenue for intervention.
LB: PRESCHOOL PHYSICAL ACTIVITY AND NUTRITION

LB-231

Formative assessment of Comadres De Saldud-a culturally sensitive obesity intervention for Latino mothers of preschool children

Authors: Martina Gallagher

Purpose: The aim was to conduct a formative assessment of a community-based obesity prevention intervention, “Comadres de Salud” (Kin Sisters in Health). Based on The Social Cognitive Theory, Comadres de Salud is a multicomponent intervention aimed at improving diet and physical activity in low-income Latino mothers and their preschool children. This intervention is unique in that it incorporates the cultural Latino scripts of familism, collectivism, simpatia and gender roles to enhance cultural sensitivity.

Methods: Latino women between the ages of 21-35, from the north side of Houston, TX, who were mothers of children ages 3-5, were be recruited for the intervention study. The intervention delivery is taking place in the preschool setting. Two focus groups (n=11) will be conducted, and acceptability surveys will be administered at the end of the intervention. Data from the focus groups was recorded and transcribed. Qualitative description was used to analyzed the focus group data. Descriptive and frequency analysis were performed on survey data.

Results: Focus groups participants perceptions of the interventions will be analyzed from the focus group data. Survey data will be summarized.

Conclusions: The formative assessment of this pilot study will serve as a useful tool to provide valuable insight into the participants’ perceptions of an intervention and its delivery.
FOOD AND PHYSICAL ACTIVITY AS REINFORCING STIMULI IN RURAL AND URBAN CHILDCARE CENTERS OF DIFFERING STAR SCORES ACROSS OKLAHOMA

Authors: Leslie K Sitton, Lauren N Outhier, Susan B Sisson, Janis Campbell, Kellie B May, Danielle R Brittain

Purpose: Reinforcement strategies are used in child care centers (CCC) to modify behaviors. The stimuli used can have lasting impacts on child behaviors. The purpose of this study is to understand the distribution of reinforcement strategies, specifically, food used to encourage positive behavior and withholding physical activity (PA) as punishment in CCC in Oklahoma.

Methods: Based on 95% confidence intervals and a 5% margin of error, a sample of 316 of the 1390 CCC in Oklahoma was needed. A 45% response rate was expected; therefore surveys were mailed to 703 centers. A randomized, stratified proportionate sample of CCC representing Oklahoma City, Tulsa, NE, NW, SE, and SW areas was collected.

Results: While 82.5% of responders (n=314) neither deny PA as punishment nor use food as incentive, 2.0% either often-or-sometimes use both as reinforcing stimuli. Over 15% use neither unfavorable stimuli, but do provide additional active playtime for children with good behavior. There were no significant differences in reinforcing strategies by star rating (1-2 vs. 3-star) or by urban-rural status. When examined by star rating, 13.6% of CCC with a star score of 1-2 versus 4.7% of CCC with a star score of 3 use food as reinforcing stimuli at least some of the time ($\chi^2=2.730$, p=0.098).

Conclusions: While the majority of CCC across Oklahoma are not using food or PA in reinforcement strategies, the discrepancy between CCC of different star scores in using food as reinforcing stimuli indicates this as an area for future direction.
LB: SOCIOECONOMIC STATUS AND HEALTH

LB-233

Socio- Economic Environment is a Predictor of Ethnic and Regional BMI Disparities in Texas Fourth Graders

Authors: Jennifer J Salinas, Manasi Shah, Jennifer L. Gay, Ken Sexton, Deanna M Hoelscher

Purpose: To evaluate disparities in the BMI of children in the fourth grader across different ethnicities and geographical locations in different counties in Texas, USA.

Methods: Data on social, economic and environmental variables was obtained from National databases such as, US Census Bureau, the Environmental Protection Agency (EPA) and National Center for Health Statistics (NCHS) and combined into a weighted index (Human Security Index). This data was linked to the SPAN Project (2009-2010) data on gender, ethnicity and BMI percentile. ANOVA was carried out to evaluate differences across Hispanic, Black and White ethnicities for BMI percentiles and the HIS index and subcomponents.

Results: Hispanic children had the highest average BMI (73.95), followed by Blacks (68.82) and Whites (62.38). Hispanic children lived in community with the highest average mean Human Security Index score (3.48), indicating the highest socio-economic insecurity. The education subcomponent of the HSI was low in Hispanic communities (10.08), compared to Blacks (10.83) and Whites (11.26). Mean BMI percentile of children residing in the border region was 73.53 as compared to non border 67.89. HSI Score of border regions was 4.11 as compared to 3.02 of non border counties.

Conclusions: Obesity is a strongly associated with the cultural background and geographic location of the communities in which fourth grade children in Texas live. Efforts to reduce childhood obesity must take into consideration the environment in which children live as it is an important risk factor for disparities among ethnic groups.
Store type and frequency of shopping and the association with dietary intake and weight among college age students in Kentucky, 2012

Authors: Nicole Tifft, Alison Gustafson

**Purpose:** Research on the food environment has begun to disentangle the interdependence between the individual and their neighborhood. However, little research has focused on college students and their food shopping habits in relation to dietary and weight status. The aim of this study was to determine the association between 1) store purchases; 2) frequency of shopping; and 3) amount spent on food with dietary and weight status among college age students.

**Methods:** College students were recruited to participate in a cross-sectional survey in spring of 2012. A total of 167 students responded to the online survey. Multivariate linear regression and multinomial regression was used to model the association between diet, weight and food shopping habits.

**Results:** Those who purchase fruits and vegetables often have a 2 unit lower BMI compared to those who purchase fruits and vegetable less often (-2.14 95% CI [-1.04, -0.10]). Those who spend $20-$30 per visit on food, purchase less types of fruits and vegetables (-0.54 95% CI [-0.82, -0.27], but also less salty snacks (-0.27 95% CI [-0.53, -0.02]), and prepared food (-0.32 95% CI [-0.52, -0.12]) compared to those who spend more. Conversely, those who spend more than $80 per visit on food, purchase more types of fruits and vegetables (0.23 95% CI [0.04, 0.46]) compared to those who spend less.

**Conclusions:** Future interventions and policies aimed at improving dietary and weight status among college students may need to consider food shopping habits and amount spent on food as a way to improve health outcomes.
College students’ perception of initiating a farmers’ market on campus

Authors: Summer Wilmoth, Lesli Biediger-Friedman, Erica Sosa, Sara Oswalt, Timothy Jones, David Bustos, Arely Perez, Meizi He

Purpose: The purpose of this study was to assess college students’ perceptions regarding feasibility of implementing and using a farmers’ market on an urban university campus in South Texas, USA.

Methods: This cross-sectional study used a proportionate stratified cluster-randomized sampling strategy to survey a representative sample of college students from an urban university in South Texas. All classes were stratified by course level, college, campus location, and time of day prior to random selection. Among the 1,132 students invited to participate, 1,065 students completed an anonymous, multiple choice, paper questionnaire regarding feasibility of implementing and using a farmers’ market on campus. Descriptive statistics were performed to analyze the data.

Results: Over 90% of respondents reported that they would like to see a farmers’ market available on campus, and approximately 87% of students said they would buy from this market. A bi-monthly farmers’ market in a high traffic area where food is currently being sold was designated as the most favorable condition for implementation. The vast majority of students (90%) indicated that the market would need to accept cash, debit, and student benefits cards to be fully utilized.

Conclusions: This study reveals that college students were interested in and would utilize a farmers’ market on campus. A farmers’ market appears to be a feasible venture to promote access to fruits and vegetables and a healthy food environment on campus.
The Relationship between Exercise Identity and Exercise during Exams

Authors: Shaelyn M Strachan, Melanie G.M. Perras, Lawrence Brawley, Kevin S Spink

Purpose: Identity theory states that individuals who identify with a behavior seek to confirm identity through behavior. In past research, exercisers reacted to a description of exercise identity-behavior inconsistency with reactions that suggested the pursuit of identity-behavior consistency; reactions were strongest for individuals with strong exercise identity. Purpose: We examined whether exercise identity is associated with the pursuit and achievement of identity-consistent exercise during a real-life behavioral challenge: university exams. Exercise identity was hypothesized to associate with students’ i) preparation to exercise during exams, ii) exercise and consistency perceptions during iii) and after exams.

Methods: Methods: In this online study, 233 university students completed the following prior to exams: exercise identity, intentions and perseverance relative to exercising during exams. Immediately and one month following exams, perseverance, exercise and consistency perceptions were assessed.

Results: Results: Regressions revealed that prior to exams, exercise identity was related to participants’ intentions ($\beta = .32, p < .001$) and perseverance for exercise during exams ($\beta = .26, p = .004$). Immediately after exams, exercise perseverance ($\beta = .56, p < .001$), frequency of exercise ($\beta = .31, p < .001$) and consistency perceptions ($\beta = .27, p < .001$) were associated with exercise identity. One month after exams, exercise identity was associated with frequency of exercise over the post-exam month ($\beta = .26, p < .001$) and consistency perceptions about exercise during the post-exam month ($\beta = .29, p < .001$).

Conclusions: Contributions: Identifying with exercise may promote identity-consistent exercise during challenging times such as the exam period.
The Association Between Delay Discounting and Exercise Goal Achievement in First-Year College Students

Authors: Lizzy Pope, Jean Harvey-Berino

**Purpose:** To determine whether ability to delay gratification as measured by a delay-discounting task predicts adherence to exercise goals in first-year college students.

**Methods:** 117 first-year students enrolled in a 12-week randomized controlled trial determining the efficacy of monetary incentives to encourage exercise participated. The computer delay-discounting task asked participants to choose between receiving a smaller amount of money immediately versus a larger reward ($1000) after a designated length of time (1 day, 1 week, 1 month, 6 months, 1 year, 5 years, or 25 years). The value of the smaller reward was adjusted in each trial until an indifference point was reached where the value of the smaller reward was subjectively equivalent to the delayed reward. The indifference points from each trial determined the rate of discounting for each participant (k), and ED50 values (1/k). ED50 values represent the number of days needed to discount the value of the delayed reinforcer by 50%. ID-card check-in and check-out records were used to determine frequency of exercise at the campus fitness center.

**Results:** There was no significant association between adherence to exercise goals and ED50 values in the overall sample, $F(1,113)= 0.41, p>0.05$. There was also no interaction between ED50 values and whether or not participants were paid to meet exercise goals, $F(1,113)=0.01, p>0.05$.

**Conclusions:** For first-year college students, ability to delay gratification as measured by a delay-discounting task, was not able to predict adherence to exercise goals. Therefore, it appears that students exhibiting a range of delay-discounting rates can successfully meet exercise goals.
LB: UNIVERSITY STUDENT NUTRITION AND PHYSICAL ACTIVITY

LB-238

Evaluation of the F.I.T. Tech university-based nutrition and physical activity program for staff, students, and faculty at Texas Tech University

Authors: Debra B Reed, Betty Blanton, Hui Chang, Katherine Albus

Purpose: To evaluate delivery and acceptability of the Fitness, Information, and Technology (F.I.T.) Tech program. Program components included team based competitions, seminars, special events, and website information to improve the nutrition and physical activity behaviors of staff, students, and faculty http://www.depts.ttu.edu/fittech/.

Methods: A web-based survey was used to collect program evaluation data from 580 participants over 6 years.

Results: After participation, 77% of participants felt more motivated to exercise, 58% motivated friends or family to become more physically active, and 32% went from being non-exercisers to regularly exercising at least twice a week. Participants (70%) exercised and ate healthy foods more often than before the program, 73% felt better physically, and 57% felt more energetic. Further, 62% were able to utilize positive stress relievers such as physical activity. More than half (53%) utilized the F.I.T. Tech website for information. Most participants (67%) were staff, indicating the program’s appeal to this segment of the population. Participants (61%) thought more highly of TTU for providing the program. Program components reported to be important to achievement of individual goals were being part of a team (69%) and being accountable to enter weekly minutes online (73%). Participants cited lack of time and scheduling conflicts as barriers to attending classes.

Conclusions: A campus–based approach appears to have potential for meeting the needs of participants. Team competition, 24/7 availability of educational information, and accountability were popular program components. Evaluations were used to make program improvements including webinars instead of classes.
Influences on nutrition and physical activity behaviors across home, work, and school domains among nontraditional college students

Authors: Lisa Quintiliani, Hillary Bishop, Mary Greaney, Jessica Whiteley

Purpose: To identify factors influencing nutrition and physical activity behaviors of nontraditional college students (older, part-time, and/or working). The socio-demographic characteristics (lower SES, racial/ethnic minority) of nontraditional students are associated with overweight/obesity, poor nutrition, and sedentary behavior, yet most college health promotion efforts focus on traditional students.

Methods: We conducted a naturalistic inquiry to explore factors affecting nutrition and physical activity behaviors of nontraditional students using semi-structured in-depth individual interviews. Study participants attended a large, public, urban university. Data were coded manually using a systematic team-based approach. Consistent themes (mentioned by 4+ participants) were identified and categorized into three domains: home, work, and school.

Results: Students (n=14) were a median age of 25 (range: 21-64), 57% men, 43% racial/ethnic minorities, and 57% employed (mean 22hrs/week). Within the domains, home (neighborhood characteristics, family, partners, friends from home), work (work environment), and school (cafeteria, vending machines) factors consistently influenced positive nutrition behaviors. Similarly, home (neighborhood including safety, partner, friends from home), work (work environment), and school (not having a car, campus structure, campus gym, friends at school) factors consistently influenced positive physical activity. Financial resources influenced all domains.

Conclusions: Results indicate consistent influences on nutrition and physical activity behaviors across home, work, and school domains for nontraditional college students. These findings suggest possible, and sometimes unconventional, intervention strategies for nontraditional students. For example, when a cafeteria meal plan is not offered and financial constraints limit eating at the cafeteria, encouraging students to make healthful choices from vending machines could be preferable to not eating at all.