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

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WORKING EVERYDAY TO PROVIDE THE HIGHEST QUALITY OF LIFE FOR PEOPLE WITH CANCER

Objec'tives

- Rationale and history for family-based interventions
- Results from two family-based interventions
  - DAMES
  - Healthy Moves

Commonali'es Across Interven'ons

- Behavioral Framework provided by Social Cogni'tive Theory and Transtheore'mal Model
- Tailoring backed by a computer-based message library of thousands of messages and hundreds of illustrations

Why a Family-Based Intervention?

Behavioral change may be more attainable if address at multiple levels

<table>
<thead>
<tr>
<th>Public Policy</th>
<th>Community (cultural values, norms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization (military, law enforcement)</td>
<td>Interpersonal (social support)</td>
</tr>
<tr>
<td>Individual (knowledge, attitude, skills)</td>
<td></td>
</tr>
</tbody>
</table>

Survivors and family members likely to share:
- genetic risk factors
- environmental risk factors

Address primary and tertiary prevention simultaneously
Review of Family-based Interventions

- 199 reports “dyad” (spouse, child, caregiver) x “intervention” x “trial”
- Topics: psychosocial support, contraception, to diet and physical activity
- On topic of diet and physical activity <30 reports
- In cancer survivors <10 dyadic interventions, <3 in diet and physical activity

Obesity associated with poorer outcomes among women with breast cancer
- Obesity associated with increased risk of breast cancer occurring in later life
- Can we capitalize on the teachable moment of cancer and the mother-daughter bond to promote weight loss in overweight mothers with breast cancer and their overweight daughters as a means of tertiary AND primary prevention?
  - AND is it best to use team or individually based tailoring?
  - AND how can you do it when pilot data show that mothers and daughters live 354 miles apart?

Daughters And MothErS (DAMES) Against Breast Cancer (R21-122413)

Feasibility Trial to promote weight loss in overweight or obese breast cancer patients and their overweight or obese adult daughters
- Enroll 87 Mother-Daughter Dyads within 2-years
- Retain at least 80% of participants
- Safe? (no serious adverse events attributable to intervention)

Assess weight loss (effect size and variance) in 3 arms:
1) Standardized Materials
2) Tailored Materials (Independent Approach)
3) Tailored Materials (Team-Based Approach)

Eligibility Criteria

MOTHERS
- Dx’d w/DCIS or Stage I-III breast cancer within past 5 yrs
- No evidence of progressive disease or 2nd primary
- Approved for contact by oncology care provider
- BMI: 25-40
- English-speaking & writing
- Completed the 5th grade
- Community dwelling, not Puerto Rico
- No pre-existing condition that excludes adherence to an unsupervised exercise intervention, e.g., scheduled for knee/hip surgery, unstable angina, heart attack or CHF within 6 M, untreated depression, dementia, paralysis.
- Exercise ≥150 min/week
- Not currently enrolled in a weight loss program
- Have biological daughter age 21 or older

DAUGHTERS
- Same as moms, but no dx of breast cancer

Tailored Intervention Materials

- All women are like their mothers, and this is in their trapery, but men is like his mother, and that, is not trappy
Tailoring – Experimental Arm

Tailored using data from baseline survey and updates from interim surveys.

Accountability and monitoring is IMPERATIVE.

Examples of tailored messages

Characteristics of the Study Sample

<table>
<thead>
<tr>
<th></th>
<th>Mothers</th>
<th>Daughters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (x, sd, range)</td>
<td>61.6(7.4/86-89)</td>
<td>32.6(1.41/21-54)</td>
</tr>
<tr>
<td>BMI (x, sd)</td>
<td>31.2(2.6)</td>
<td>32.9(1.4)</td>
</tr>
<tr>
<td>Race (%)</td>
<td>White 74%</td>
<td>Hispanic 7%</td>
</tr>
<tr>
<td></td>
<td>Asian 18%</td>
<td>Black 1%</td>
</tr>
<tr>
<td>Current Smoker</td>
<td>Yes 2.9%</td>
<td>No 97.1%</td>
</tr>
<tr>
<td>Income &lt;$40K/year (%)</td>
<td>31%</td>
<td>28%</td>
</tr>
<tr>
<td>Cancer Stage (%)</td>
<td>0 18%</td>
<td>I 43%</td>
</tr>
<tr>
<td></td>
<td>II 31%</td>
<td>III 4%</td>
</tr>
<tr>
<td></td>
<td>missing 4%</td>
<td></td>
</tr>
<tr>
<td>Months from diagnosis</td>
<td>24 (13) (2 – 61)</td>
<td></td>
</tr>
<tr>
<td>Miles Apart</td>
<td>75 (86) (0-646)</td>
<td></td>
</tr>
</tbody>
</table>

Measures/Measurement Points

<table>
<thead>
<tr>
<th>Process Data</th>
<th>Baseline Every 7 wks</th>
<th>6 M Every 7 wks</th>
<th>12 M Every 7 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Status (BMI) self-report &amp; actual</td>
<td>X</td>
<td>X</td>
<td>X-X-X</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>X</td>
<td>X-X-X</td>
<td>X-X-X</td>
</tr>
<tr>
<td>Self-report, accelerometers</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2-Day Dietary Recalls</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Perceived Risk of CA</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Social Support</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adult Attachment</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Demographics</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DAMES: Loss in Body Weight (kg)

DAMES: Reduction in Waist Circumference(cm)
DAMES: Adherence to Assessment Surveys
P-values by Randomization Status (0.0019) by Mothers vs Daughters (0.0342)

DAMES: Baseline to 12M Increases in Moderate-Vigorous Physical Activity (min/week)

DAMES: Baseline to 12M Changes in Caloric Intake

DAMES: Baseline to 12M Changes in Quality of Life

DAMES: Overall Conclusions
• Intervention is safe
• Retention is excellent
• Target enrollment met, but considerable barriers
• Adherence fair
• No systematic changes observed in QoL and blood pressure
• All arms lost weight and increased physical activity and diet quality, but effects more pronounced with tailored programs — surprisingly more differences observed with individual vs. team intervention
Healthy Moves: Rationale

- The relationship between survivors and spouses may be very different than mothers and daughters.
- Spouses tend to live in the same household – potential for enhanced social support.

Theoretical Model

Aims

Primary Aims:
1. Modify an existing multi-behavior lifestyle intervention for couples.
2. Pilot test the couples-based intervention compared to a survivor-only intervention to explore feasibility and estimate effects on primary outcomes of survivor DQ and PA to provide effect sizes for a larger trial.

Secondary Aims:
1. Explore the effects on survivors’ physical functioning, body composition, and marital quality, as well as intervention mediators including social support and self-efficacy.
2. Explore the effects on the interventions on spouse health behaviors, physical functioning, body composition, QOL, and marital quality, as well as intervention mediators.

Eligibility

- Diagnosis of loco-regional breast (Stages 0-IIA), prostate (Stages I-II), or CRC (Stages I-II)
- Completion of primary treatment
- Practice of one of two poor health behaviors (< 150 minutes of moderate or < 60 minutes of vigorous PA/day for women or < 9 F&V/day for men)
- 18 years or older
- Read and speak English
- Reside in Houston area
- Have a spouse/significant other with whom they have resided for at least one year

Interventions

- Randomized to Survivor Only or Couples-Based intervention
- 9 counseling sessions delivered via webcam
- Provided a pedometer, plate, Therabands, and a fat gram counter
- Interventions lasted 6 months

Measures

- Physical Activity – Godin Leisure Time Exercise Questionnaire; accelerometer
- Diet – Automated Self-administered 24-hour Dietary Recall (ASA24)
- Performance Tests of Physical Functioning
- Anthropometric measurements (height, weight, waist and hip circumference)
- Health-related Quality of Life – Rand-36
- Dual-energy X-ray Absorptiometry (DXA) – first 16 participants only
- Social Cognitive Theory mediators – Self-efficacy, social support
### Recruitment

- **Approached (N=358)**
  - Refused (N=103)
    - Not interested
    - Demographic mismatch
    - Moved
    - Other
  - Not reached (N=15)
  - Contacted (N=140)
    - Consented (N=22)
    - Too far
    - Survivor/spouse ill
    - Not interested
    - No consent
    - Time for interview
  -Baseline (N=22)
- **Inteligible (N=28)**
  - Refused (N=11)
  - Not reached (N=2)
  - Not interested (N=2)
  - Ineligible (N=26)
- **Enrolled (N=14)**
  - Survivor Only (N=10)
  - Couples-based (N=4)

14-week mailed Couples-Based (N=11 couples)

- **Refused (N=103)**
  - No computer
  - Spouse too healthy
  - Residence location
  - No spouse
  - Health wrong diagnosis
  - Eligible (N=99)

- **Baseline Assessment**
  - Recruitment
  - Enrollment        14.6%
  - Approach
  - Consent
  - Baseline
  - (N=151)
  - (N=22)

### Demographics

- **Survivor**
- **Spouse**

<table>
<thead>
<tr>
<th>Age</th>
<th>63.00 (10.4)</th>
<th>63.64 (7.11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Female</td>
<td>59.5%</td>
<td>81.0%</td>
</tr>
</tbody>
</table>
| Cancer Diagnosis
  - Breast | 59.1% | 36.4% |
  - Prostate | 4.5% |
| Race/Ethnicity
  - Caucasian | 73.4% |
  - African American | 9.5% |
  - Hispanic | 5.6% |
  - Other | 9.0% |
| Education
  - Some college grad | 64.0% |
  - College grad | 35.0% |

### Survivor Outcomes

<table>
<thead>
<tr>
<th>Body Mass Index</th>
<th>Couples-based Δ</th>
<th>p</th>
<th>Survivor Only Δ</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body mass index</td>
<td>5.29 (1.9)</td>
<td>.05</td>
<td>0.87 (1.8)</td>
<td>.32</td>
</tr>
<tr>
<td>Baseline Consen</td>
<td>3.91 (1.8)</td>
<td>.09</td>
<td>2.43 (2.5)</td>
<td>.22</td>
</tr>
<tr>
<td>Weight</td>
<td>5.31 (1.7)</td>
<td>.07</td>
<td>2.42 (2.5)</td>
<td>.22</td>
</tr>
<tr>
<td>Waist Circumference</td>
<td>2.52 (1.4)</td>
<td>.12</td>
<td>2.76 (2.8)</td>
<td>.02</td>
</tr>
<tr>
<td>% fat Total (BMI)</td>
<td>4.39 (2.4)</td>
<td>.14</td>
<td>3.29 (3.1)</td>
<td>.21</td>
</tr>
<tr>
<td>% Saturated Fat (DEXA)</td>
<td>3.21 (2.0)</td>
<td>.23</td>
<td>1.01 (2.1)</td>
<td>.34</td>
</tr>
<tr>
<td>Fruits &amp; Vegetables (average per day)</td>
<td>3.77 (1.0)</td>
<td>.01</td>
<td>1.86 (1.9)</td>
<td>.02</td>
</tr>
<tr>
<td>Fiber Consumption</td>
<td>3.44 (3.0)</td>
<td>.02</td>
<td>4.40 (11.0)</td>
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<tr>
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<tr>
<td>Carbohydrate</td>
<td>0.55 (0.7)</td>
<td>.05</td>
<td>1.67 (1.8)</td>
<td>.10</td>
</tr>
<tr>
<td>PA (min of moderate &amp; strenuous)</td>
<td>6.83 (19.1)</td>
<td>.03</td>
<td>6.44 (13.4)</td>
<td>.02</td>
</tr>
<tr>
<td>Physical Component Score</td>
<td>5.27 (0.5)</td>
<td>.04</td>
<td>6.31 (2.2)</td>
<td>.05</td>
</tr>
<tr>
<td>Mental Component Score</td>
<td>7.05 (14.9)</td>
<td>.47</td>
<td>6.06 (18.4)</td>
<td>.87</td>
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### Spouse Outcomes

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<td>.87</td>
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### Process Data

- **Retention (% 6 months)**
  - Couples-based | 92% |
  - Survivor Only | 100% |
  - Spouse | 100% |
- **Attendance (% sessions)**
  - Couples-based | 93% |
  - Survivor Only | 97% |
  - Spouse | 97% |
- **Difficulty in using web-cam (1=extreme; 5=not at all)**
  - Couples-based | 3.7 (1.6) |
  - Survivor Only | 3.3 (1.9) |
  - Spouse | 3.0 (1.0) |
- **Length of sessions (1=short; 5=too long)**
  - Couples-based | 3.0 (0.0) |
  - Survivor Only | 3.1 (0.0) |
  - Spouse | 2.8 (0.4) |
- **Concentrate Effectiveness (1=not at all; 5=strenuously)**
  - Couples-based | 4.5 (1.1) |
  - Survivor Only | 4.4 (0.8) |
  - Spouse | 4.2 (1.3) |

### Baseline Characteristics

- **Body Mass Index**
  - Couples-based | 27.73 (6.42) |
  - Survivor Only | 29.59 (5.80) |
  - Spouse | 27.56 (6.44) |
- **% fat Total (BMI)**
  - Couples-based | 38.13 (6.65) |
  - Survivor Only | 40.99 (7.16) |
  - Spouse | 38.13 (6.65) |
- **Fruit & Vegetables (average per day)**
  - Couples-based | 2.57 (1.25) |
  - Survivor Only | 2.58 (1.34) |
  - Spouse | 2.57 (1.25) |
- **Physical Component Score**
  - Couples-based | 47.01 (13.14) |
  - Survivor Only | 45.36 (11.30) |
  - Spouse | 53.96 (23.57) |
- **Mental Component Score**
  - Couples-based | 56.10 (18.84) |
  - Survivor Only | 56.10 (18.84) |
  - Spouse | 56.10 (18.84) |
Healthy Moves: Conclusions

- The pilot study met feasibility benchmarks.
- Results demonstrate efficacy for survivors.
- High concordance in spousal health behaviors, but no changes for spouses when only the survivor is targeted.
- Results highlight the necessity for including the spouse, which may be important for long-term behavior change.

Overall: Conclusions

- Tailored interventions hold particular promise in promoting lifestyle changes.
- Dyad-based interventions also hold particular promise, but both need to benefit both partners.
- Uptake, adherence and effect may depend upon the composition of the dyad – selection of the partner may be best left to the survivor.

Thank-you! Questions?

Thanks to all survivors who participated in this research!

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Stephanie Barlow, MS, RD
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MD Anderson's Multi-Disciplinary Research Program
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George Baum, MA
Sharon Giordano, MD
Miguel Rodriguez-Bigas, MD
Curtis Pettaway, MD

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