Methods of Intervention at Individual and Small Group Levels

Effective Strategies and Delivery Approaches to Changing Diet and Activity for Weight Control

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Comprehensive lifestyle interventions consisting of diet, physical activity and behavior therapy produce 8 kg weight loss in 6 months with frequent in person treatment

Section 3.4.2. p 37
2013 AHA/ACC/TOS Guidelines for Management of Overweight and Obesity in Adults (Jensen MD et al., Circulation, 2013)

Requests for Presentation

1) Theoretical models or behavior change techniques for Weight Control Interventions

2) Factors Impacting Efficacy of Face to Face Weight Management Interventions
   - format, where, who delivers

3) Evidence for Alternatives to Face to Face Delivery Modes
   - channels and factors impacting efficacy

THEORETICAL MODELS OR TECHNIQUES FOR WEIGHT LOSS INTERVENTIONS

Theories Underlying Interventions Aimed at Changing Individuals

Therapeutic Approaches and Theories

- Behavior Modification (Beh)
- Classical Conditioning
- Operant Conditioning
- Cognitive Behavioral Therapy (CBT)
- Cognitive Theories
- Social Cognitive Theory/Social Learning Theory
- Trans-Theoretical Model (TTM)
- Self-Determination Theory (SDT)/Motivation/Focused

Social Ecological Model of Health Promotion (McLeroy et al., 1988)
Evidence for Approaches

<table>
<thead>
<tr>
<th>Therapeutic Approaches and Theories</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral &amp; CBT combined with Diet and Exercise</td>
<td>• Most commonly used approach</td>
</tr>
<tr>
<td>Classical Conditioning</td>
<td>• Foundation of DPP and Look Ahead</td>
</tr>
<tr>
<td>Operant Conditioning</td>
<td>• Strong evidence</td>
</tr>
<tr>
<td>Cognitive Theories</td>
<td>• Consistent findings in Spahn et al Systematic Review 2010 for nutrition counseling</td>
</tr>
<tr>
<td>Trans-Theoretical Model (TTM)</td>
<td>• Insufficient evidence for effects on weight loss (Cochrane Review Mastellos et al. 2014)</td>
</tr>
<tr>
<td>Motivation Focused Approaches</td>
<td>• Often combined with Bmod/CBT approaches</td>
</tr>
<tr>
<td>Self-Determination Theory (SDT)</td>
<td>• Evidence for combined effects vs. controls</td>
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</tbody>
</table>

Behavioral/CBT is effective

Components

- Uses structured curriculum and variety of behavioral and cognitive behavioral techniques to achieve goals
  - Dietary modification for calorie reduction
  - Exercise goals for increased expenditure
  - Self-monitoring
  - Other Techniques:
    - Stimulus Control
    - Goal Setting
    - Problem Solving
    - Relapse prevention
    - Cognitive Restructuring
    - Motivation enhancement
  - Weight Management Counseling Support

Newer in Field to Focus on Behavior Change Techniques

- Effective Techniques
  - Few RCTs isolating specific techniques; more commonly a package of techniques form the intervention that is studied
  - Meta-regression across 122 studies (Michie et al. 2009)
    - Average # of techniques in treatment package reported = 6 (sd 3)
    - Interventions focused on self-monitoring more effective
    - "In conclusion, our analyses offer clear support for including self-monitoring of behavior... as well as..."
      - prompting intention formation,
      - prompting specific goal setting,
      - providing feedback on performance, and
      - prompting review of behavioral goals

What are behavior change techniques?

- Are operationally defined aspects of the content of the intervention (what is actually "done" in the intervention to change behavior)
- Individual techniques are linked to theory/theories
- Examples:

  - Provide feedback on performance
  - Provide social feedback on performance
  - Provide general encouragement
  - Provide specific encouragement
  - Provide feedback on performance
  - Provide specific feedback on performance
  - Provide specific goal setting
  - Provide review of behavioral goals
  - Provide review of behavioral goals

FACTORS IMPACTING EFFICACY OF FACE TO FACE WEIGHT MANAGEMENT INTERVENTIONS
**Key Components of a Comprehensive Lifestyle Modification Program to Achieve a 7% to 10% Weight Loss**

- **Frequency and duration of treatment contact:**
  - Weekly contact, in person or by telephone, for 20–26 wk.
  - Group or individual contact.

- **Behavior therapy prescription:**
  - Daily monitoring of food intake and physical activity by use of paper or electronic diaries.
  - Weekly monitoring of weight.
  - Structured curriculum of behavior change (e.g., Diabetes Prevention Program).
  - Regular feedback from an interventionist.

Adapted from Table 2: Wadden, et al. Circulation. 2012;125:1157-70.

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**Format: Individual vs. Group F2F**

- Strong evidence for both approaches
  - Diabetes Prevention Program – Individual
  - Look Ahead – Combination (3 group, 1 individual per month)

- RCT comparing individual vs. group –
  - Group greater WL; no effect of matching to participant preference on outcome
    - Renjilian, Perri et al. 2001

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**Group F2F v. Group Conference Calls**

**Results**

- **Weight Losses**
  - 6 mos: 18 mos
  - Groups were not different at either time


**Intensive Contact is More Effective**

- **Obesity Guidelines 2013: Best Results**
  - >14 sessions in 6 months
  - Greater WL than moderate-low intensity

- **Moderate intensity:**
  - 1-2 sessions per month
  - Better than usual care
  - WL of ~ 2-4 kg

- **Low Intensity**
  - Fewer than monthly
  - Not better than usual care

2013 AHA/ACC/TOS Guidelines for Management of Overweight and Obesity in Adults (Jensen MD et al., Circulation, 2013)

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**3 month weight loss**

**Differences in Contact Schedule**

- **Weekly vs. Monthly**
  - 12 groups
  - Weekly Lessons Provided in Group Months 1-3
  - Standard Behavioral

- **Stepped Care**
  - -6.9

- **Monthly**
  - 3 groups
  - Weekly Lessons Months 1-3
  - -5.5

3 Months

Data from Jakicic, Tate, et al. 2012, JAMA

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**Results in Community Settings: Changes in Setting, Contact or Interventionist?**

- Attenuated effects vs. clinical trial results
  - Review of 28 US based studies translating DPP into community or “real world” settings: Average weight loss 4-5%
    - Mohammed, et al., Health Affairs, 2012)

- May reflect numerous changes:
  - participants recruited (often more diverse),
  - reduced contact to be feasible for setting constraints and to be more cost efficient, or
  - Loss of fidelity? Training or supervision of interventionists?
Success In TOURS study

- Economically disadvantaged participants
- Rural communities
- Cooperative Extension leaders (bachelor’s trained)

Factors Likely Related to Success:

- Extensive contact: 50 contacts over 18 mos
- Training: High degree of training and supervision of interventionists

From: Extended-Care Programs for Weight Management in Rural Communities: The Treatment of Obesity in Underserved Rural Settings (TOURS) Randomized Trial. Perri et al., Arch Intern Med. 2008

EVIDENCE FOR ALTERNATIVES TO FACE TO FACE DELIVERY MODES

Why Internet and Technology-based Interventions?

Mobile phone

% of American adults who own a cell phone or smartphone

Source: Pew Internet & American Life Project

Interactive Technologies versus In-Person Counseling: RE-AIM

Source: www.reaim.org
Observed Data Baseline Carried Forward

Internet (n=159)  InPerson (n=150)  Hybrid (n=153)  

<table>
<thead>
<tr>
<th></th>
<th>Internet</th>
<th>InPerson</th>
<th>Hybrid</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Weight Loss [kgs; mean(SD)]</td>
<td>-5.5 (5.6)</td>
<td>-8.0 (6.1)</td>
<td>-6.0 (5.8)</td>
<td>&lt;0.01</td>
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<td>Percent weight lost [mean(SD)]</td>
<td>-5.8 (5.4)</td>
<td>-8.3 (6.1)</td>
<td>-6.4 (5.7)</td>
<td>&lt;0.01</td>
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<td>Percent losing &gt; or equal to 5% (%)</td>
<td>52.8</td>
<td>65.2</td>
<td>58.8</td>
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<td>52.2</td>
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Table 2
Mean Weight Loss from Baseline to 6 months with Observed Data and Intent-to-Treat

RESULTS: In person weight losses are ~2 kg > than Internet

2 RCTs of Internet Behavioral WL

Internet Behavioral Therapy Significantly Improves Weight Loss vs. Internet Education

RCT study comparing Internet Education to Internet Behavioral Weight Loss Program (IBT) over 6 mos in Adults Tate, et al., JAMA 2001; 285: 1172-1177.

Weekly e-Counseling Significantly Improves Weight Loss over 1 year

RCT study comparing Internet Behavioral/Weight Loss Program (IBT) to IBT plus weekly e-mail counseling to a control group of Adults at increased risk for Type 2 Diabetes, to study a translation of the Diabetes Prevention Program to Internet delivery. Tate, et al., JAMA 2003; 289: 1833-1836

Automated Tailored Feedback Improves Weight Loss and Is As Effective as Human e-Counseling at 3 Months

RCT comparing Website with either No Counseling (NoC), Weekly Automated Computer Tailored Feedback (Computer), and Weekly e-mail Counseling (Counselor). The Computer group achieved at 5% Weight Loss at 6 months.

What is an Internet Intervention?

Internet interventions are typically behaviorally or cognitive-behaviorally-based treatments that have been operationalized and transformed for delivery via the Internet. Usually, they are highly structured; self or semi-self guided; based on effective face-to-face interventions; personalized to the user; interactive; enhanced by graphics, animations, audio, and possibly video; and tailored to provide follow-up and feedback.

Improving the Automated Approach

- Expanded and more varied message library
- Greater degree of tailoring might engage users longer
- Tailoring on additional variables may make the experience more like human e-counseling
- Use the automated approach in conjunction with periodic human interactions

References:

Harvey-Berino, J., West et al., Preventive Medicine, 2010

DGAC Meeting 3, March 14, 2014
**Frequency of E-mail Contact**

<table>
<thead>
<tr>
<th>Months</th>
<th>Counselor E-mail</th>
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<td>0-6</td>
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<tr>
<td>6-9</td>
<td>Monthly</td>
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<tr>
<td>9-12</td>
<td>None</td>
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**Weight Change**

- Baseline
- 3 Mo
- 6 Mo
- 12 Mo

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<tr>
<th>Weight Change (lbs)</th>
<th>0</th>
<th>-2</th>
<th>-4</th>
<th>-6</th>
<th>-8</th>
<th>-10</th>
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Contact 1x/month

12 month follow-up added – not part of original study – data unpublished

**Exploratory Analysis** – Comparing the Internet Behavior Therapy Arms from 2 Studies with Different Contact Frequency Between 6 and 12 months

**What worked ??**

**Active Ingredients in Internet Behavior Therapy**

- Structured Lessons?
- Accountability – Reporting weight?
- Generic weekly prompt via e-mail?
- Peer Support via Message Board?
- Reinforcement & Problem Solving with e-counselor?

**Daily Weighing Intervention Using Smart Scales and e-Mail**

2 Group RCT:
- Daily Weighing Intervention with e-scales and weekly tailored email
- No other self-monitoring prescribed
- Wait-list Control given e-scales

(Steinberg, Tate et al. in press)

**Daily Weighing Intervention Using Smart Scales and e-Mail**

- Average Weighing Frequency
- % Weight Loss

(Steinberg, Tate et al. Obesity, 2013)
### HYBRID OR COMBINATION APPROACHES

#### Pilot Hybrid Face to Face and Email Coaching
- RCT 6 month pilot trial examining reduced frequency Face to Face group meetings combined with one of 3 types of health coaching via email
  - Professional coaches
  - Peer to Peer coaches (randomly assigned)
  - Mentor (successful weight loser)
- 12 F2F group meeting over 6 mos
  - 0-6 weeks – weekly (6)
  - 7-12 weeks – biweekly (3)
  - 12-24 – monthly (3)

Leahey, et al., Obesity, 2012

#### RCT: Internet Group Chat Treatment vs. Hybrid

<table>
<thead>
<tr>
<th>Weight Loss Group</th>
<th>Internet Only</th>
<th>In Person</th>
<th>Hybrid</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Internet-Only</td>
<td>-6.6 (5.6)</td>
<td>-5.5 (5.6)</td>
<td>-5.5 (5.6)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>In Person</td>
<td>-9.1 (6.1)</td>
<td>-7.6 (6.2)</td>
<td>-7.6 (6.2)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Hybrid</td>
<td>-9.1 (5.5)</td>
<td>-5.7 (5.5)</td>
<td>-5.7 (5.5)</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Harvey-Berino, West et al., Preventive Medicine, 2010

#### Emerging evidence: Using mobile technology is promising
- Podcasts
- Mobile Internet
- Apps
- SMS (text messaging)
- Hybrid
Text Messaging

Mobile based approaches produce better outcomes than control conditions
- Few studies to date
  - 14 studies – most smaller and shorter term
  - Better WL than controls
  - Mean WL in mobile 2.56 kgs
- 2 studies with mobile podcasts, twitter support, monitoring or combination
  - Means 2.4 - 3 kgs
  - Theory-based components contributed to greater efficacy
    Turner-McGrievy & Tate, 2011

Summary

- Behavioral and cognitive behavioral approaches have most evidence for efficacy.
- Package known to be effective
- Less evidence for individual techniques with exception of SM, FB, counselor support.
- Potential for delivery of face to face treatment to be reduced with intensive calls, email, and potentially mailed structured treatment materials.
- Community and Technology delivered interventions based on the effective model are better than controls, less effective than gold standard face to face
  - Including components known to be effective in F2F improves efficacy.

QUESTIONS