Podcasting Off the Pounds: Results of two mobile weight loss trials and next steps in forming interdisciplinary collaboration around mHealth obesity research

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HEALTH PROMOTION, EDUCATION, AND BEHAVIOR
Overview

- Pounds Off Digitally (POD): PODStudy 1 and 2
  - Methods and Results
- Upcoming research
- Call for collaboration
What is podcasting?

- Comes from the terms “broadcast” and “iPod.”
- Podcasts are audio files that may be downloaded and listened to on a computer or any portable audio player (MP3 player).
**PODStudy 1:** To determine whether podcasting weight loss information is an effective way to promote weight loss and improve diet and physical activity through a 3-month intervention with adults comparing an existing weight loss podcast to an enhanced, theory-based podcast.

**PODStudy 2:** Enhancing and lengthening intervention (6 months) to see if adding mobile self-monitoring, social support, and prompting enhances weight losses.
POD 1: Groups

- Overweight participants randomly assigned to:
  - Enhanced, theory-based podcast:
    - introduction
    - audio diary
    - nutrition and exercise information
    - continuing soap opera
    - goals
  - Control podcast: “Best available” weight loss podcast
    - Focused on cognitive restructuring: "Think Fit. Be Fit."
    - Example topics included:
      - Goal setting tips
      - Types of exercise

Methods: Intervention components and how each targets the theory constructs

<table>
<thead>
<tr>
<th>SCT Construct</th>
<th>Intervention Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectancies</td>
<td>The <em>Nutrition and Exercise Information</em> of each Podcast emphasized the importance of achieving a healthy weight to increase the value participants place on weight loss.</td>
</tr>
<tr>
<td>Expectations</td>
<td>The <em>Audio Diary</em> allowed for a first-hand experience of weight loss and informed participants about what to expect from trying to lose weight.</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>The end of the Podcast included a <em>Goal to Achieve</em>. Participants were encouraged to track their weight, calories, and exercise. The aim of goal achievement was to increase confidence.</td>
</tr>
<tr>
<td>Behavioral Capability</td>
<td>Knowledge about how to lose weight, exercise, make dietary changes, etc. was presented during the <em>Nutrition and Exercise Information</em> and <em>Soap Opera</em> sections of the podcast.</td>
</tr>
</tbody>
</table>
## POD 1: Demographics

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th>Enhanced Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>37</td>
<td>41</td>
</tr>
<tr>
<td><strong>Age (years) (mean ± SD)</strong></td>
<td>39.6 (± 12.2)</td>
<td>37.7 (± 11.8)</td>
</tr>
<tr>
<td><strong>Sex [ N (%) ]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7 (19)</td>
<td>13 (32)</td>
</tr>
<tr>
<td>Female</td>
<td>29 (81)</td>
<td>28 (68)</td>
</tr>
<tr>
<td><strong>Race, ethnicity [ N (%) ]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>6 (17)</td>
<td>5 (13)</td>
</tr>
<tr>
<td>White</td>
<td>28 (78)</td>
<td>35 (85)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (5)</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

*No significant differences between groups at baseline*
POD 1 Results: Changes in weight and BMI

<table>
<thead>
<tr>
<th>Weight Loss Change</th>
<th>Change in BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Enhanced</td>
</tr>
<tr>
<td>-0.3 ± 2.1 kg</td>
<td>-0.1 ± 0.7 kg/m²</td>
</tr>
<tr>
<td>(0.67 lbs)</td>
<td>-1.0 ± 1.2 kg/m²</td>
</tr>
<tr>
<td>-2.9 ± 3.5 kg</td>
<td></td>
</tr>
<tr>
<td>(6.4 lbs)</td>
<td></td>
</tr>
</tbody>
</table>

P <0.001 for both
## POD 2: Groups

<table>
<thead>
<tr>
<th>Podcast only</th>
<th>Podcast + mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twice weekly podcasts for 0-6 months</td>
<td>Twice weekly podcasts for 0-6 months</td>
</tr>
<tr>
<td></td>
<td>Monitoring of diet and physical activity using app on mobile device</td>
</tr>
<tr>
<td></td>
<td>Group and moderator support via Twitter</td>
</tr>
</tbody>
</table>

## Baseline Demographics of POD Study 2

<table>
<thead>
<tr>
<th></th>
<th>Podcast only</th>
<th>Podcast + Mobile Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>49</td>
<td>47</td>
</tr>
<tr>
<td><strong>Age (years) (mean ± SD)</strong></td>
<td>43.6 (± 11.7)</td>
<td>42.6 (± 10.7)</td>
</tr>
<tr>
<td><strong>Sex [ N (%) ]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13 (27)</td>
<td>11 (23)</td>
</tr>
<tr>
<td>Female</td>
<td>36 (73)</td>
<td>36 (77)</td>
</tr>
<tr>
<td><strong>Race, ethnicity [ N (%) ]</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>10 (20)</td>
<td>9 (19)</td>
</tr>
<tr>
<td>White</td>
<td>38 (78)</td>
<td>35 (75)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2)</td>
<td>3 (6)</td>
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</tbody>
</table>
Pod
@PodStudy Thanks!!

16 Jan

PodStudy
Saw the lion king tonight!!! Just as good as I remembered it!! Ate dinner out but it was low in cals!!!

16 Jan

PodStudy
@Pod congrats!!!

16 Jan

eedmo
Spent last week in writing workshop. Thought I compensated for the high cal food, apparently not enough. Glad to be back in control.

16 Jan

eedmo
@Pod You are such an inspiration!!

16 Jan

Pod
Just had to buy new pants again - 34 waist now and medium shirts! One year ago I was wearing size 48 waist!

15 Jan

podstudy
Looks like some good recipes Brie! Thanks for passing along

15 Jan

Brie_PODStudy Brie McGrew

15 Jan

d pod
Have a cold which demotivates me to exercise. Trying to be better about recording foods and tweeting.

15 Jan
Mobile diet and physical activity app

Calorie Counter

- Search
- Barcode Scan

Quick Pick

- Foods
- Restaurants & Chains
- Popular Brands
- Supermarket Brands

My Counter

- Food Diary

Weight Tracker

- Weight change from Wednesday, February 24: 201 lb
- Weight change from Saturday, February 20: 202 lb
- Weight change from Saturday, February 13: 203 lb

Calorie Monitor

- Breakfast:
  - 1 mug Coffee: 6.08 Fat, 68.62 Carbs, 19.39 Prot, 404 Cals
  - 1 cup Lowfat Plain Yogurt
  - 1 cup Orange Juice
  - 2 slices regular Toasted Rye Bread

- Lunch:
  - 2 extra small Bananas: 28.61 Fat, 93.48 Carbs, 11 Prot, 645 Cals

- Total (11 items):
  - 40.43 Fat, 431.45 Carbs, 82.01 Prot, 2,286 Cals
POD Study 2 Results

Kgs Lost

P = .88 for time by group interaction

30 minutes of podcasts/week
10 minutes of podcasts/week
Differences in type of self-monitoring used

Podcast+Mobile group
- Paper
- Mobile app
- Web

Podcast group
- Paper
- Mobile app
- Web
Twitter engagement and weight loss

- Wide range of Twitter use (0-385 total posts)
- Adjusting for demographics, posts to Twitter significantly predicted % weight loss at 6 months, such that every 10 posts to Twitter corresponded with a -0.5% weight loss ($B = -0.48$, $t(46) = -4.9$, $p < 0.001$).
Where do we go from here?

- Moving mHealth forward with interdisciplinary research
- Thinking outside the app- Using all aspects of mobile technology to tailor interventions to enhance:
  - Assessment and self-monitoring
  - Social support
  - Tailored feedback
  - Providing “human” touch and interaction
  - Using objective sensor data to provide real time feedback
- Go beyond the RCT
Interdisciplinary research at USC
Interdisciplinary research at USC

- Computer Science & Engineering and Health Promotion, Education, & Behavior
  - Under review-NSF Smart Health and Wellbeing: Motivating Human Wellness Behavior from Sparse Data
- Computer Science & Engineering, Psychology, Health Promotion, Education, & Behavior, and Exercise Science
  - Under review-NIH R01 Modeling Social Behavior: The Efficacy of Agent-Mediated Social Networks for Modeling Healthy Behaviors
More is needed...

- Collaborations across institutions in South Carolina
- Need for mHealth interventions to address health disparities, especially among rural populations

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### Part 1. Overview Information

<table>
<thead>
<tr>
<th>Participating Organization(s)</th>
<th>National Institutes of Health (NIH)</th>
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<tbody>
<tr>
<td>Components of Participating Organizations</td>
<td>National Heart, Lung, and Blood Institute (NHLBI)</td>
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<tr>
<td>Funding Opportunity Title</td>
<td>Cardiovascular Risk Reduction in Underserved Rural Communities (R01)</td>
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<td>Activity Code</td>
<td>R01 Research Project Grant</td>
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<tr>
<td>Funding Opportunity Announcement (FOA) Number</td>
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</table>

Stage 2 feasibility phase (about 18 months) activities may include:

1. Testing on a small scale the hypothesis that adults who participate in multi-component interventions in multiple settings compared to a single component intervention (e.g., economic development intervention) will prevent or reduce multiple cardiovascular disease risk factors.
2. Exploring the utility of various technologies for cardiovascular disease prevention in rural communities (e.g., telemedicine, electronic health records).
3. Piloting research strategies to improve policies and community infrastructure shown in epidemiologic studies to have the potential to reduce cardiovascular disease risk factors.
4. Exploring innovative approaches for adapting efficacious studies into practice in rural communities.
Beyond the app: Mobile Diets for Pounds Off Digitally (MoDPoD)

You lost 2 pounds this week! That is great. Keep up the good work!

Under Review NIH R21: Exploratory Grants for Behavioral Research in Cancer Control
Beyond the RCT: mHealth may require new ways of doing research

Conceive of a study
Submit Grant
Gather Pilot Data
Receive Funding
Conduct the study
Submit publications for review

Eric Hekler, PhD; School of Nutrition and Health Promotion; Arizona State University; SBM 2012
Working with you: Let’s work together!

- Behavioral weight loss interventions
- Testing and applying theory in mHealth research
- Nutrition approaches for disease prevention and treatment
Working with you: Let’s work together!

**ME**
- Behavioral weight loss interventions
- Testing and applying theory in mHealth research
- Nutrition approaches for disease prevention and treatment

**YOU**
- Computer Science and Engineering Expertise
- Senior eHealth/mHealth mentorship
- Mobile app development
- Lab studies

Working with you:
Let’s work together!
Working with you: What can we do?

- Use sensors to assess behaviors and provide real-time feedback
- Use mobile technology to increase adherence and engagement (e.g., mobile gaming) and reduce participant burden (e.g., automated self-monitoring)
- Use existing apps to conduct quick tests of behavioral theory
- Work with industry to explore existing data
The Obesity Society’s eHealth/mHealth Section (EMS)

- Join our section!
- The Obesity Society’s President:
  - Patrick M. O'Neil, Ph.D.
    - Professor of Psychiatry and Behavioral Sciences at MUSC
    - Director of the Weight Management Center
Questions?

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