Smart Phone Apps for Dietary Self-Monitoring

Results of a pilot weight loss trial

Christopher Wharton, PhD
Carol Johnston, PhD, RD
Nutrition Program
Arizona State University
Overview

- Dietary self-monitoring
- Technological innovation
- Study and results
- Discussion and continuing work
Dietary monitoring

- **Traditional tools**
  - 24-hour recall
  - Food Frequency Questionnaire
  - Diet records

- **Limitations**
  - Reliance on accurate recall
  - Consistency in reporting
  - Respondent burden

Dietary self-monitoring

- Important strategy for weight management
  - NWCR: self-monitoring one of few successful strategies

- Innovation in monitoring
  - Web-based self-monitoring
    - ASA-24
    - Web sites dedicated to dietary record keeping connected to databases

Gap in the literature

- More and more mobile monitoring interventions
  - 92% of Americans own a mobile phone
  - 68% own smart phones

- Few studies consider feasibility of specific apps for dietary self-monitoring
  - Dozens of diet-focused apps
  - Lose It: boasts 50,000,000+ lbs lost

Study design

- 8 week weight-loss trial

- Smart phone owners 18-65 yrs.
  - Stratified by age and gender
  - Semi-randomized into 3 groups:
    - App users (n = 19)
    - Memo users (n = 13)
    - Paper-and-pencil users (n = 15)
Study design

- Training: all counseled to try for 1 lb weight loss/wk
  - App users trained on app
  - Memo and Paper users: trained on exchange system
  - All: ~150 kcals exercise/day

- Memo and Paper-and-Pencil groups
  - Received weekly dietary counseling
Study design

- **Pre- to post- data**
  - Body weight
  - Dietary quality
    - Subset of diet records used for HEI calculations

- **Dietary intake:**
  - Complete days: >800 kcals of intake
  - Incomplete days: 1-800 kcals of intake
  - Missing days: No data
Results

<table>
<thead>
<tr>
<th></th>
<th>Smart phone App</th>
<th>Smart phone memo</th>
<th>Paper/pencil</th>
<th>P^b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, M/F</td>
<td>6/13</td>
<td>2/11</td>
<td>4/11</td>
<td>.583</td>
</tr>
<tr>
<td>Age, y</td>
<td>43.7±3.5</td>
<td>41.5±4.0</td>
<td>40.8±3.8</td>
<td>.832</td>
</tr>
<tr>
<td>Weight, lb</td>
<td>185.7±6.8</td>
<td>189.9±11.6</td>
<td>181.3±10.0</td>
<td>.824</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>29.9±0.9</td>
<td>31.0±1.7</td>
<td>28.9±1.0</td>
<td>.523</td>
</tr>
<tr>
<td>Activity</td>
<td>2.3±0.2</td>
<td>2.0±0.2</td>
<td>2.1±0.1</td>
<td>.338</td>
</tr>
<tr>
<td>Daily energy, kcals</td>
<td>1791±181</td>
<td>1997±266</td>
<td>2163±129</td>
<td>.422</td>
</tr>
<tr>
<td>Total HEI score</td>
<td>63.9±3.8</td>
<td>59.8±3.5</td>
<td>61.1±2.5</td>
<td>.682</td>
</tr>
</tbody>
</table>

^aData represent mean ± standard error.  
^bP value derived from one-way analysis except for gender where Chi-square analysis was utilized. There were no significant differences between groups.
## Results

<table>
<thead>
<tr>
<th>Group</th>
<th>Complete Days (±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>App</td>
<td>43.0 ± 10.9</td>
</tr>
<tr>
<td>Memo</td>
<td>34.8 ± 12.5</td>
</tr>
<tr>
<td>Paper-and-Pencil</td>
<td>30.7 ± 18.0</td>
</tr>
</tbody>
</table>

*Significantly different from Paper-and-Pencil (p=0.024)
Results

- All groups lost significant weight (p<0.01)
  - Mean = -4.6 lb
  - Range: -14.8 to +2.6 lb
Results

- HEI scores did not change for any group (p=.286)
- Trends were noted
Discussion

- Multiple studies suggest mobile devices are useful and preferred
- Apps now offer consumer-friendly data collection systems
Discussion

- Mobile phones are becoming ubiquitous
  - Multi-functionality makes use for self-monitoring second nature
  - Mobile phones are carried everywhere
Difficulties with apps

- Lack of attention to:
  - Improving quality of diet

- Sustaining behavior over time
  - Assumption: accomplishment self-sustaining
Continued and future work

- What is the impact on sustained weight loss?
- How does an app + counseling impact weight management success?
  - Ongoing
- Can we get smarter with app data?
Thank you!

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