Smartphone Apps and Web 2.0 Technologies for Weight Management: A Scoping and Systematic Review

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Scoping Review => Systematic review (with meta-analysis) => Review of apps

PROSPERO ID: CRD42014010323
Review Objectives

1) To investigate the current use of these technologies in eHealth research in the domain of weight management

2) To identify interventions, their content and behaviour change techniques (BCTs) employed

3) To assess the effectiveness of the interventions and optimal combinations of BCTs and delivery modes.
Research Questions

What is the current **state of the research** discussing the use of **smartphones** as standalone or in combination with Web 2.0 technologies for **weight management**?

What **types of studies** have been conducted?

How **many interventions**?

What **technologies** are used, for **what purposes**?
Search Strategy: Keywords

S1: Weight mngmt
S2: Diet
S3: PA
S4: Smartph./mHealth
S5: Social media/Web 2.0

S = (S1 OR S2 OR S3) AND (S4 OR S5)

S1-S2: (Hartmann-Boyce, Johns, Jebb, Aveyard, 2014; Oude Luttikhuis et al., 1996; Wieland et al., 2012); S3: (Foster, Richards, Thorogood, & Hillsdon, 2013); S4: (Bert, Giacometti, Gualano, & Siliquini, 2014; Huckvale, van Velthoven, Cash-Gibson, Felix, & Car, 2011; Marcano-Belisario, Greenfield, Huckvale, Gunn, & Car, 2012); S5: (Bardus, 2011; Chang, Chopra, Zhang, & Woolford, 2013; Chou, Prestin, Lyons, & Wen, 2013).
Search Strategy: Sources

Health Sciences
- Medline
- Embase
- CINAHL
- Cochrane Library
- Global Health
- SPORTDiscus

Social & Behav. Sciences
- Web of Science
- PsycINFO x2
- PsycARTICLES
- Comm. & Mass Media Complete
- ERIC
- Psych. And Behav. Sci. Collection

Computer sciences
- ACM Digital Library
- IEEE Explore

Grey Literature
- Open Grey
- WorldCAT

www.exeter.ac.uk/medicine
Search Strategy: Inclusion Criteria

Reference Type: Peer-review publications (English, 2004-2014)

Scope: Discuss the role of mobile devices and/or Web 2.0 technologies with the specific focus on weight management or on the behaviours that contribute to weight management (i.e., diet or PA).

Type of study: Empirical studies

Technologies: Mobile devices (incl. smartphones, PDAs) and Web 2.0 technologies
Records identified through electronic database searching n = 5490

Records after duplicates removed n = 4003

Records screened n = 4003

Records excluded n = 3561

Full-text articles (n = 510)

Studies included in qualitative synthesis n = 324

Studies included in quantitative synthesis (meta-analysis) n = ??

Two reviewers
Cohen’s kappa: .585
Gwet’s AC1 = .905
Agreement = 92.3%

Two reviewers
Cohen’s kappa: .720
Gwet’s AC1 = .774
Agreement = 87.5%

Study selection

www.exeter.ac.uk/medicine
Charting: Reference Types and Years

**Reference types**

- Conference proceedings: 57, 17.59%
- Journal articles: 266, 82.10%
- Book chapters: 1, 0.31%

**Number of articles by reference type**

- **Total**:
  - 2004: 0
  - 2005: 0
  - 2006: 5
  - 2007: 4
  - 2008: 2
  - 2009: 10
  - 2010: 13
  - 2011: 30
  - 2012: 41
  - 2013: 49
  - 2014: 53

- **Book and Conf Proceedings**:
  - 2004: 0
  - 2005: 0
  - 2006: 4
  - 2007: 0
  - 2008: 2
  - 2009: 13
  - 2010: 26
  - 2011: 31
  - 2012: 49
  - 2013: 53
  - 2014: 4

- **Journal Articles**:
  - 2004: 0
  - 2005: 0
  - 2006: 1
  - 2007: 4
  - 2008: 10
  - 2009: 4
  - 2010: 9
  - 2011: 21
  - 2012: 12
  - 2013: 0
  - 2014: 0
Charting: Countries of studies

<table>
<thead>
<tr>
<th>Country</th>
<th>Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. United States</td>
<td>161</td>
</tr>
<tr>
<td>2. Australia</td>
<td>34</td>
</tr>
<tr>
<td>3. United Kingdom</td>
<td>20</td>
</tr>
<tr>
<td>4. Netherlands</td>
<td>13</td>
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<tr>
<td>5. South Korea</td>
<td>9</td>
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<td>6. Italy</td>
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<td>7. Finland</td>
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<td>8. Canada</td>
<td>8</td>
</tr>
<tr>
<td>9. Germany</td>
<td>7</td>
</tr>
<tr>
<td>10. Spain</td>
<td>6</td>
</tr>
</tbody>
</table>
Charting: Type of Studies and Purpose (n = 324)

- **Describe** (53%)
- **Potential** (14%)
- **Test/evaluate the efficacy** (33%)
Preliminary considerations

Despite a large number of “descriptive” and “potential” studies, there is some evidence suggesting that smartphone and Web 2.0 technologies are employed in weight management interventions.

There is a considerable number of studies that evaluate (or will evaluate) the efficacy of these technologies.
Next Steps

• **Complete data extraction**
  – **Population**: age, gender, setting
  – **Interventions**: Format/Contact type
  – **Interventions**: Content: change techniques/strategies; engagement strategies
  – **Comparisons**
  – **Outcomes** (weight, BMI, etc.)

• **Qualitative narrative synthesis**

• **Meta-analysis**: conducted if the included studies are sufficiently homogeneous in terms of their interventions and outcomes reported and if the information retrieved is complete enough to extract useable outcome data.
Thank you!

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