ImpulsePal: An app a day keeps the cravings at bay.

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Background

- Obesity is an ongoing global problem.
- 2 in 3 adults overweight or obese.¹
- NHS cost £6.05 billion in 2016.²

¹Public Health England (2016) PHE Gateway
²Tovey (2017) IEA: London
Background

• Weight loss of 5% greatly reduces health risk. 3

• Even with strong intentions, people still struggle and often fail when faced with temptation. 4

• Food choices often occur impulsively, with little conscious awareness. 5

3. Jensen et al. (2014) J Am Coll Cardiol, 63, 2985–3023
Background

Changing Human Behavior to Prevent Disease: The Importance of Targeting Automatic Processes

Theresa M. Marteau, Gareth J. Hollands, Paul C. Fletcher

Science 21 Sep 2012:
Vol. 337, Issue 6101, pp. 1492-1495
DOI: 10.1126/science.1220618
Aims

(a) Refine and assess the feasibility of a smartphone app-based weight management intervention that helps target impulsive processes to facilitate weight management.

(b) Assess the feasibility of conducting a full scale trial.
Methods

Design

• Feasibility parallel randomised controlled trial.
• 2:1 (ImpulsePal vs waiting list control).
• Action Research > 2 cycles of intervention delivery and user feedback.
Methods

**Recruitment**
- Cycle 1 (Sept ‘15 – March ‘16); Cycle 2 (Oct ‘16 – April ‘17).
- Tier 2 & 3 weight management referral in Devon.
- Local advertising.
  - Posters, flyers, UoE and Exeter 10 000 cohort newsletters

**Eligibility**
- BMI >25 kg/m².
- Aged 16+.
- Android smartphone.
- Travelling distance of Exeter.
Methods

Measures

• Recruitment & retention.
• Outcomes completion.
• Weight & Height. (Observed body measures)
• Snacking behaviour. (Food Frequency Questionnaire)

• Intervention use. Frequency and total time spent
• App and Trial usability and satisfaction. (Questionnaires)
• Quantitative process measures.
• Semi-structured interviews. (Intervention group only)
Methods

**Assessments**

- Baseline.
- Follow-up: 1 month and 3 months.

**Analysis**

- Descriptive:
  - Recruitment, retention, intervention use, measures-completion, weight loss.
- Exploratory analyses (ANCOVA) of differences in weight loss between intervention and control groups at one and three months controlling for baseline BMI.

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Results

HPD invites sent 585

HPD interest 59

ExTend 32

Local advertising 72

Word of mouth 31

Expressions of interest 194

Assessed for eligibility 179

Unable to assess 15

Background – Aims – Methods – Results – Conclusion

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Randomised
88 (49%)

58 ImpulsePal

Drop-out
9 (16%)

Weight data
48 (83%)
Questionnaires
47 (81%)

Weight data
43 (74%)
Questionnaires
43 (74%)

30 Control

B

Drop-out
4 (13%)

Weight data
26 (87%)
Questionnaires
24 (80%)

Weight data
24 (80%)
Questionnaires
23 (77%)

Drop-out
+ 6

Drop-out
+ 2

Retention 1M
85%

Retention 3M
76%

Not eligible
91 (51% of assessed)

iOS
57 (32% of assessed)

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### Sample Characteristics

<table>
<thead>
<tr>
<th></th>
<th>ImpulsePal (58)</th>
<th>Control (30)</th>
<th>Whole sample (88)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong> N(%)female</td>
<td>37 (64%)</td>
<td>20 (67%)</td>
<td>57 (65%)</td>
</tr>
<tr>
<td><strong>Age</strong> M(SD)</td>
<td>46.7 yrs (14.6)</td>
<td>46.9 yrs (11.9)</td>
<td>46.8 yrs (13.9)</td>
</tr>
<tr>
<td><strong>Weight</strong> M(SD)</td>
<td>93.1kg (17.8)</td>
<td>98.3kg (20.9)</td>
<td>94.9 (19.0)</td>
</tr>
<tr>
<td><strong>BMI</strong> M(SD)</td>
<td>32.8kg/m^2 (5.6)</td>
<td>34.4kg/m^2 (6.9)</td>
<td>33.3 (6.1)</td>
</tr>
</tbody>
</table>
Exploring weight loss

<table>
<thead>
<tr>
<th></th>
<th>ImpulsePal M(SD)</th>
<th>Control M(SD)</th>
<th>Mean [95%CI] difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Month</td>
<td>-0.86kg (1.34)</td>
<td>0.12kg (1.73)</td>
<td>1.03kg [0.33 to 1.74]*</td>
</tr>
<tr>
<td>3Month</td>
<td>-1.63kg (2.13)</td>
<td>-0.95kg (4.40)</td>
<td>1.01kg [-0.45 to 2.47]*</td>
</tr>
</tbody>
</table>

*Adjusted for baseline BMI

Pooled Standard Deviation for weight loss at 3 months
3.1
App use

*Usage statistics*

- 56 participants with usable app statistics
- 70% continued use after 1 month.
- Of those who were no longer accessing the app after 1 month, 38% had dropped out of the study.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Total time</th>
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<tbody>
<tr>
<td></td>
<td>Range in days</td>
<td>Range in minutes</td>
</tr>
<tr>
<td></td>
<td>Median (SD)</td>
<td>Median (SD)</td>
</tr>
<tr>
<td>1 month</td>
<td>1 day – 23</td>
<td>3.5 – 446.8</td>
</tr>
<tr>
<td></td>
<td>7.0 (5.1)</td>
<td>38.1 (81)</td>
</tr>
<tr>
<td>3 months</td>
<td>1 – 51</td>
<td>3.5 – 1444.6</td>
</tr>
<tr>
<td></td>
<td>10 (11)</td>
<td>46.4 (218.1)</td>
</tr>
</tbody>
</table>
Feedback

**Inhibition Training**

Participants did not understand the use of neutral images. They suggested healthy foods might provide more of a “contrast”. This was added in for version 2 along with personalisation of the food items and considered as a positive feature.

The task becomes repetitive and boring over time. Even with improvements, over time people still get bored. Self-reported use decreased over time but did not disappear completely.

**If-then planning**

Considered effective and helpful for making small changes.

Often used without app.

Reminders were considered necessary in particular for plans concerning infrequent situations. A reminder function was included for version 2.
Feedback

**Urge-Surfing**

Very well-received technique. Considered easy to use.

App is no longer required once user has learnt the steps.

Some showed surprise at altered thinking about how a person is affected by a craving or temptation.

**Emergency Button**

Considered to provide support at critical times.

Thought to strengthen feelings of control due to knowledge it is there if needed.
Usability and satisfaction

**ImpulsePal App**
43 usable questionnaires returned

- 35% agreed and 63% strongly agreed *easy to understand*
- 28% agreed and 70% strongly agreed *easy to use*
- 51% were *satisfied* and 42% *very satisfied*

**Trial**
66 usable questionnaires returned

- 14% agreed and 83% strongly agreed trial *easy to understand*
- 26% agreed and 73% strongly agreed *Qs easy to complete*
- 17% were *satisfied* and 79% *very satisfied with experience*
Conclusion

• Able to recruit through various routes in Devon and could be further improved by offering an iOS version.
• Participants are willing to be randomised to a waiting list control group
• Retention is as expected.

• A range of techniques can be delivered and learned via an app.
• A full-scale trial is now required to assess the effectiveness of ImpulsePal.
Thank you

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