Reducing bias in intervention development:
Assessing design fidelity in an online treatment for physical activity and depression

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BACKGROUND
Depression is a common mood disorder affecting 350 million people worldwide (World Health Organization [WHO], 2012)

Physical activity (PA) maybe as effective as existing treatments (Cooney et al., 2013)

eMotion is a web-based behavioural intervention based on behavioural activation with a focus on physical activity
Understand low mood/depression

Identify R.P.N activities and rate difficulty and make plan

Implement plan and self-monitor progress

Review progress, problem solve and amend plan accordingly

Figure 1. Overview of intervention processes (taken from (Farrand et al., 2014))
A key aim of taxonomies is to code protocols/manuals to more accurately describe interventions (Ogden et al., 2016)

Two thirds of BCT’s identified in intervention descriptions didn’t align with manuals (Abraham and Michie 2008)

Prior to delivery, a panel of experts should review their protocols to ensure the active ingredients are fully operationalised (Borrelli et al, 2011)
Possible problems: lack of expertise, independence, experience, time, groupthink (Janis., 1972)

Delivery fidelity assesses how well an intervention is delivered according to its protocol

There is a lack of research reporting on design fidelity (Borrelli et al., 2011)
So, do we agree?

Yes

Yes

Agree!

Yes

No

Bad idea!

We're doomed!
1. Assess the extent to which eMotion corresponded with the underlying theoretical components

2. To recommend a new process for assessing design fidelity
METHOD
Introduction
Provides an overview of the course and how to get the most out of it.

Core Modules
These are the key weekly modules to help you get on top of your low mood.

Unlockable Modules
You can unlock these modules at your progress through the core weekly modules to give your programme an extra boost!

Problem Solving
Click here for some extra help with the weekly modules.
List of all BCT’s in intervention made into coding manual

Other ‘non intended’ BCT’s added from taxonomy

Intervention content rated by independent researcher for presence/absence per module of BCT’s included

Inter-rater reliability with intervention designer
<table>
<thead>
<tr>
<th>Technique</th>
<th>Definition</th>
<th>Example Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credible source (BA/PA)</td>
<td>Present verbal or visual communication from a credible source in favour of or against the behaviour</td>
<td>Present information given by an expert to emphasise the importance of following subsequent advice about (physical) activity</td>
</tr>
<tr>
<td>Information about emotional consequences (BA/PA)</td>
<td>Provide information (e.g. written, verbal, visual) about emotional consequences of performing the behaviour</td>
<td>Explain that increasing (physical) activity increases psychological wellbeing and mood</td>
</tr>
<tr>
<td>Information about health consequences (BA/PA)</td>
<td>Provide information (e.g. written, verbal, visual) about health consequences of performing the behaviour</td>
<td>Explain that increasing (physical) activity decreases risk of type 2 diabetes</td>
</tr>
<tr>
<td>Demonstration of the Behaviour (BA/PA)</td>
<td>Provide an observable sample of the performance of the behaviour, directly in person or indirectly e.g. via film, pictures, for the person to aspire to or imitate</td>
<td>Demonstrate to participant how to be more (physically) active via a case study/example</td>
</tr>
</tbody>
</table>
RESULTS
Figure 2. AC1 for techniques relating to behavioural activation
Figure 3. AC1 for techniques relating to physical activity
<table>
<thead>
<tr>
<th>Technique</th>
<th>BA</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credible Source</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Information about emotional consequences</td>
<td>0.46</td>
<td>0.85</td>
</tr>
<tr>
<td>Information about health consequences</td>
<td>1.0</td>
<td>0.73</td>
</tr>
<tr>
<td>Demonstration of Behaviour</td>
<td>0.3</td>
<td>0.37</td>
</tr>
</tbody>
</table>
After discussion, agreement was good for all modules.

For techniques in which the independent won the argument, the following actions were taken.....
If intended technique absent - Designer needs to add technique to content or remove from intervention description.

If non intended technique present - Designer removes technique from materials or amends intervention description to reflect its presence.
DISCUSSION
Differences in levels of abstraction of technique may contribute to agreement.

Whether a given technique makes sense given the behaviour (e.g. BA for health consequences?)

If two coders disagree at this level, then what does this mean for other interventions?
1. Make coding manual of all BCT’s in intervention

2. Pilot coding manual with independent coder on other materials

3. After refinement/clarification, code intervention

4. Conduct inter-rater reliability testing

5. Discussions on disagreements

6. Make amendment to intervention/manuscript

7. Re-test reliability with new coder
ANY QUESTIONS?

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