University of Huddersfield Repository

McMillan, Brian, Hickey, Eamonn, Patel, Mahendra and Mitchell, Caroline

Mobile health apps: The emperor’s new clothes?

Original Citation


This version is available at http://eprints.hud.ac.uk/id/eprint/26089/

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

http://eprints.hud.ac.uk/
Background
The WHO estimates that 63% of deaths are a result of lifestyle related diseases, many of which are preventable through the reduction of smoking, physical inactivity, excessive alcohol use, and unhealthy eating1. The increasing capabilities of mobile phones and tablet devices has seen an explosion in the number of mobile applications ('apps'), targeting health behaviour change2. 93% of UK adults have a mobile phone, 61% have a smartphone, and 90% of those are in possession of it 24 hours a day3. Mobile apps are low cost, can be individually tailored in real- time, and can address the needs of the user and can collect, analyse and relay data back to researchers. Of the 2.4 million apps available, over 97,000 are related to health and fitness4. There is growing evidence for the efficacy of apps in health behaviour change, however, one particular concern is that of quality control5. The NHS Apps library uses expert peer review to ensure that apps included in the library are relevant to people living in England, use information from a verifiable or trusted source, comply with the Data Protection Act, and are clinically safe7. In addition to these safeguards, it would be useful to have a quality control process for health behaviour change apps that would enable users and health professionals to ascertain how closely the app developers had considered the NICE behaviour change guidance9. This study ascertained how the NICE (2014) Behaviour Change Guidance ('BCG') could be applied to mobile apps for health behaviour change interventions.

Methods
A qualitative analysis of the NICE BCG was conducted in order to ascertain which aspects could be relevant for an app quality assessment process. Suggestions in the guidance were then converted to yes/no questions of relevance to app quality. Health behaviour change intervention apps in the NHS apps library were examined (N=49). Answers to questions extracted from the NICE guidance were entered into a SPSS database, along with other relevant details regarding the apps to be examined, such as: app name, behaviour being targeted, the platform on which the app was available, and cost. Additional questions were added, such as one pertaining to whether or not the app was "Information Standard" certified. Each of the behaviour change apps in the library were then coded into the database, using information that was gleaned from the app description in the library, on the app store, and on any related websites. The individual apps themselves were not installed on any device.

Table 1 shows the 9 themes emerging from a qualitative synthesis of the NICE BCG, average % positive responses and average inter-rater agreement. App purpose was usually clear. Overall, under a quarter of apps showed strong evidence of thorough planning & development and one fifth showed evidence of addressing behavioural maintenance and relapse. Few apps demonstrated a focus on usability, and evidence for evaluation of app efficacy was poor. Documentation varied: with a third of questions relating to initial assessment and tailoring answered positively. Under half of questions relating to behaviour change techniques (BCT) were answered positively. Inter-rater agreement was high with the exception of data protection.

Table 1: Results from qualitative synthesis of NICE Behaviour Change Guidance

<table>
<thead>
<tr>
<th>Theme</th>
<th>Example question</th>
<th>Average % Yes</th>
<th>% rater agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Is the target behaviour clearly specified?</td>
<td>90.3</td>
<td>69.8</td>
</tr>
<tr>
<td>Planning &amp; development</td>
<td>App developed in collaboration with target group?</td>
<td>21.1</td>
<td>86.6</td>
</tr>
<tr>
<td>Usability</td>
<td>Does the app have special features for specific needs?</td>
<td>6.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Assessment &amp; Tailoring</td>
<td>Does the app assess users motivation to change?</td>
<td>33.5</td>
<td>93.9</td>
</tr>
<tr>
<td>BCT</td>
<td>Does the app facilitate access to social support?</td>
<td>43.8</td>
<td>93.2</td>
</tr>
<tr>
<td>Maintenance &amp; Relapse</td>
<td>Does the app include techniques to address relapse?</td>
<td>20.0</td>
<td>96.6</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Will the efficacy of the app be evaluated?</td>
<td>4.7</td>
<td>97.0</td>
</tr>
<tr>
<td>Documentation</td>
<td>Is there a publically available manual for the app?</td>
<td>43.6</td>
<td>86.7</td>
</tr>
<tr>
<td>Data Protection</td>
<td>Does the app comply with data protection standards?</td>
<td>100.0</td>
<td>33.3</td>
</tr>
</tbody>
</table>

Discussion
This study represents the first attempt to apply the NICE Behaviour change guidance to mobile apps aimed at health behaviour change. The nine themes that emerged from this study could usefully form the basis of an app quality assessment process. The importance of clarity in the questions posed during this process was evident in the poor level of inter-rater agreement on the issue of data protection. Further exploration of inter-rater disagreements revealed differences in question interpretation. Space limitations have prevented the full range of quality assessment questions being included here but one issue raised by this study pertains to how much weight an app quality evaluation process should place upon independent raters, and how much of the process could be carried out using self-submission by app developers themselves.

Conclusions and practice implications
This adaption of the NICE guidance could form the basis of a structured approach to health behaviour change app quality assessment. Future work could focus on developing a consensus of expert and user opinion. A database of 'kite marked' health behaviour change apps would be valuable not only for users but also for healthcare professionals who could recommend them to patients secure in the knowledge they had been subjected to a rigorous quality assessment process.

References