Author’s response to reviews

Title: Identifying effective components for mobile health behaviour change interventions for smoking cessation and service uptake: protocol of a systematic review and planned meta-analysis

Authors:

Pritaporn Kingkaew (umpk@leeds.ac.uk; pritaporn.k@hitap.net)
Liz Glidewell (L.glidewell@leeds.ac.uk)
Rebecca Walwyn (R.E.AWalwyn@leeds.ac.uk)
Hamish Fraser (H.Fraser@leeds.ac.uk)
Jeremy Wyatt (j.c.wyatt@soton.ac.uk)

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Author’s response to reviews:

Dear reviewers and editors of Systematic Reviews journal,

We wish to sincerely thank you and your reviewers for their constructive comments on the previous version of the manuscript entitled, “Identifying effective components for mobile health behaviour change interventions for smoking cessation and service uptake: protocol of a systematic review and planned meta-analysis” (SYSR-D-16-00350). We addressed all the points made, and modified the manuscript accordingly. Our responses to the specific comments are as follows.

In response to Associate Editor:

1. Who will conduct the literature searches? The Cochrane Handbook suggests an experienced librarian perform the search. Will it be peer reviewed using the PRESS checklist (go to PubMed and enter PMID: 19230612)?

- PK is responsible for conducting the literature search. However, the search term was developed with the support from Senior Information Specialist at the University of Leeds.

- As suggested by the Associate Editor, the search terms have been peer reviewed by an information specialist using PRESS checklist on 21 June 2017. The information specialist suggests to revise subject headings and text word searching. Please see the PRESS peer review in the additional file (PRESS Assessment form-Kingkaew RRL 21062017.docx).
- An updated search strategy from Ovid MEDLINE has been modified (see Additional file 2.docx). Details of the PRESS peer review process and the references have been added to the manuscript (page 8, line 11-13).

2. "All analyses will be undertaken using the most up to date version of STATA." The version of the software that will be used is required, as well as the specific routines for all the analyses should be reported. Relevant references are also needed.

- Details and reference have been added to the manuscript (page 10, line 10-16).

3. Rationale for the random-effects model selection is needed.

- Random-effect model recognized within study variance and between study variance as the nature of the studies included in this systematic review is likely to be differed (intervention and patient population). The rationale behind the study is that there is a lot of heterogeneity between studies. Consistent with this assumption a random effects model is used to estimate a pooled treatment effect. Details and reference have been added to the manuscript (page 10, line 18-25)

4. Which between-study variance estimator will you use in your meta-analysis? For a review of methods see PMID: 26332144.

- DerSimonian and Laird methods of moment estimator will be used in this study. This method is the most commonly used approach and is the default method used in STATA. However, the appropriateness of this method depends on the number of sample size (number of studies including in the meta-analysis). Details and reference have been added to the manuscript (page 10, line 18-20)

5. Which meta-analysis model will be used (e.g., inverse-variance, Mantel-Haenszel)? Rationale for this selection is also needed.

- Inverse-variance will be used as it is suitable for all types of effect size. Details and reference have been added to the manuscript (page 10, line 18-20)

6. More details are needed for the I-square assessment. Also, which will the next steps be in the case of important between-study heterogeneity?

- When I^2 is over 50% (moderate heterogeneity), heterogeneity will be addressed through meta-regression and sensitivity analyses. Details and reference have been added to the manuscript (page 11, line 7-9)
7. The covariates that you will consider conducting a subgroup analysis should also be prespecified.

- Subgroup analysis will consider characteristics of intervention and control groups, including the use of theory and behaviour change techniques used. Details have been added to the manuscript (page 12, line 17-20)

8. Please mention the minimum number of studies required in a meta-regression analysis, as well as to assess for publication bias and small-study effects in order to avoid power problems. Also, it should be clearly reported what the next steps will be if funnel plot asymmetry is identified.

- A meta-regression analysis will be conducted when there is at least 10 studies (Jackson, 2010). Details and reference have been added to the manuscript (page 12, line 1).

- Publication bias and small-study effects has been addressed in the manuscript (page 11, line 11-21).

In response to Reviewer #1:

Minor Revisions:

1. The authors indicate that they intend to report whether theory was used in the design in the intervention. It may be of benefit to use the Theory Coding Scheme (Michie and Prestwich, 2010) as a tool to better report the use of theory.

- We can see the benefit of using all Theory Coding Scheme; however, some of the coding is not applicable to the intervention design (e.g. results discussed in relation to theory). Also, it is not feasible to use all 19 items either due to the expected number of studies in the meta-regression analysis. However, if the number of studies exceed 50, we will consider to explore all 19 items. Details have been added to the manuscript (see table 1).

2. The authors indicate that they will code the intervention for BCTs. Will they be coding the intervention descriptions as published or will they be contacting authors of the interventions for additional intervention materials? Either would be suitable (with their own inherent limitations) but at the moment it is currently unclear in the protocol.

- We will code the intervention for BCTs based on available literatures (including additional materials, e.g. study protocol, and descriptive and qualitative study explaining the development of intervention, etc.). We will not contact authors for additional intervention materials (manuscript page 9, line 9).
3. It is unclear in the protocol whether the authors plan to code the comparator groups (whether control, usual care or alternate intervention). BCT coding of the comparator groups is critical to identify those components that are different is the groups that may prove more effect that others. I would suggest coding the comparator groups.

- We aim to code both the intervention groups and comparator groups. A statement is added under the section “Data collection and data extraction” in the manuscript (page 9, line 11-12).

4. I'm not entirely sure how you will identify those BCTs used for improved utilization smoking cessation services versus those for smoking cessation.

- Utilization of smoking cessation services will only include behaviour-related outcomes (e.g. the number of smoking cessation services attendance). Therefore, in the case where studies specifically identify the BCTs for the utilization of smoking services, it will be coded. It will not be coded, if otherwise. Details have been added to the manuscript (page 7, line 21-23).

5. Meta-analysis reporting risk ratio will be used for smoking behaviour, but no meta-analysis reported for the utilisation of smoking cessation services. Is there a planned meta-analysis for utilization of services? Is the utilization of services part of the descriptive analysis and it's not really two behavioural interventions?

- We expected to explore the utilization of services and that only descriptive analysis is likely to be feasible for the utilization of services as the majority of studies included in previous meta-analysis studies do not mentioned this type of behaviour. However, where there is at least 10 studies, a meta-analysis and meta-regression will be conducted. Details and reference have been added to the manuscript (page 10, line 10-15).

In response to Reviewer #2:

P4 l10: Could author provide more than one reference to support the statement?

- More references have been included in the manuscript (page 4, line 10).

P4 l16: What "public smoking cessation service" stands for??? Examples given in p7 l21-2 "smoking cessation services attendance, number of people who set a quit date with smoking cessation services" could not fit in a same category; when the first is from public perspective, the second resembles to a willing, intention or objective from personal perspective. Thus, refining your "definition" would be necessary!

- The wording “public smoking cessation service” has been changed to “smoking cessation service” to avoid confusion in the manuscript (page 4, line 16).
Reported uptake of smoking cessation services can vary in different contexts. For this review, we will limit to the number of attendance to smoking cessation services. As the reviewer suggests, setting a quit date is more about engagement rather than service utilization. See the manuscript for the modification (page 7 line 22-23 and table 1).

P7 19-11: Seems too broad and has a scoping review orientation.

- This review aims to include rigorous evaluations all kinds of mobile health technology. Since mobile technology is rapidly changing, only focus on single technology may not be sufficient to address the research question in this area. From previous meta-analysis studies, it is suggested that the included technologies are not too broad and it is feasible to conduct meta-analysis.

P7 15: Better statement is needed. What versus what is to be compared????

- Rephrase to “All smokers, including those who intend to quit smoking and those who do not intend to quit smoking, from any sources or settings.” in the manuscript (page 7, line 5-7).

P7 17: What is the operational content of "verified… self-reported smoking abstinence"?

- Rephrase to “Biochemically verified” in the manuscript (page 7, line 18 and 20).

Search strategy

Given the aim of identifying trials and studies including those from low- and middle-income countries, the review would benefit from searching a freely available databases such as LILACS http://lilacs.bvsalud.org/en/ or HINARI http://www.who.int/hinari/en/

- We will add the LILACS database into our list we originally excluded it as most studies within this database are in Spanish and Portuguese (page 8, line 8).

- Unlike MEDLINE, EMBASE and other databases listed in this study, HINARI does not contain searching tools. It is a portal to many databases, including MEDLINE, etc.

P7 118-19: Not enough, manual screening is also needed!!!

- Grey literature will be conducted through a search from Open Grey and WorldCat Dissertations and Theses. These two databases are recommended for searching for Grey literature.

P8 120: What is the purpose of this 20% of random sample. Do not understand!!!! Exhaustive screening by reviewers is the rule, so far!!!

- Although, it is recommended that the screening should be conducted by two independent reviewers to minimise any errors and reduce potential biases. However, the method of extraction by one researcher, with a second researcher independently checking for accuracy and completeness is an accepted minimum method for data extraction (CRD’s guidance for
undertaking reviews in health care, 2009). This method is considered to be more efficient. The purpose of 20% of random sample is to identifying any problems in the early stage of data extraction. Any disagreements will be solved prior to the full review to minimise any errors from one reviewer.

P11 122-23: Specific covariates have to be targeted. It is confusing that for instance, a theory be a covariate.

- All specified covariates are listed in detail in Table 1. For example, “Theory used to design intervention” includes 1) no theory used, 2) theory used to inform intervention, 3) theory used to classify participants, 4) theory used to tailor interventions according to participants. Rephrase “Theory used to design intervention” to “the use of theory to design the intervention” for better understanding (see table 1).

P13 12-5: "While de Bruin (2016) plans to extract….. data collection.". Could not see or understand the add-value of it. Please reframe if there is any chance that the excerpt would support your discussion!

- Rephrase to “While de Bruin (2016) plans to extract information regarding BCTs from primary research groups, the BCTs identified from research groups can be subjected to bias due to retrospective data collection” (page 13, line 15-16).

Major comment

P6 18-13: On taxonomy basis, difference is hard to make between the objective 1 and 2 and the 3 versus 4. For instance, objective 2 could be: what is the uptake of smoking cessation services [in relation with the effectiveness of smoking cessation]? Reframing is needed.

- Further clarification needed from the reviewer as we think it is clear that the difference between objective 1 and 2 is outcomes (smoking cessation and uptake of smoking cessation services, respectively). Also, the difference between objective 3 and 4 is outcomes (smoking cessation and uptake of smoking cessation services, respectively).

P7 118-19: In comparison to primary outcomes, it is crucial to clarify the statement "Secondary outcomes include verified smoking abstinence at any follow-up period". It is very confusing this duplication.

- This is not a duplication. The secondary outcome is strictly limited to biochemically verified smoking abstinence at any follow-up period. It is expected that fewer studies reported biochemically verified smoking abstinence.

Over the manuscript, the author mentions "Binary outcomes". It is surprising that no further details are given, which leaves the impression that the "compulsory" preliminaries screening was barely done. Therefore, this study could be a hardship venture. The following statement is
another illustration: "the potential limitation …the outcomes for smoking cessation service uptakes are still unknown" (P13 l6)

- We would welcome advice from the editor on which point needs to be addressed as this is unclear. The primary outcome of this study is smoking abstinence (binary outcome), which is very clear in the literature. We have addressed the issue about outcomes regarding the smoking cessation service uptake in the previous comments.

We would like to re-submit the revised manuscript and hope that the reviewers will find this version acceptable.

Sincerely yours

Authors