Reviewer’s report

Title: To what extent can behaviour change techniques be identified within an adaptable implementation package for primary care? A prospective directed content analysis

Version: 0 Date: 01 Oct 2017

Reviewer: Kathleen Bagot

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IMPS-D-17-00507

To what extent can behaviour change techniques be identified within an adaptable implementation package for primary care? A prospective directed content analysis

Thank you for the opportunity to review the above manuscript. The manuscript presents a study which develops a pro forma implementation package with the aim to be adapted to address four quality indicators (QIs). For four identified QIs (from prior work), the authors chose three delivery mechanisms (argued available in primary settings), identified key domains of the Theoretical Domains Framework (drawing on prior published work), mapped the relevant technique categories from the Behavior Change Technique Taxonomy to those domains, conducted stakeholders' meetings, and developed and piloted content.

This is a comprehensive approach to developing an implementation package. There are a number of strengths to the current study, including the multi-stage, multi-disciplinary, evidence-based, theoretically-driven and stakeholder-reviewed process undertaken to develop implementation package for quality indicators. Focusing on delivery mechanisms using resources typically available in primary care settings and using vocabulary and experiences are also strengths, increasing the likelihood of acceptability and uptake. Overall, the paper was well written, tables were generally helpful in understanding the content and process, and the limitations transparent. I look forward to reading the empirical results of the evaluation of these packages.

I do, however, have a number of comments and queries for the authors to consider prior to publication. I have included many questions to ensure clarity as the cover letter indicates that this study 'presents a method for verifying the presence of behaviour change technique (BCT) content in interventions'. Currently, further information would be required to utilise/replicate this method.

Given the focus within the cover letter and the title, I anticipated reading a manuscript which outlined a comprehensive evaluation of identifying BCTs in a developed implementation package. However, the bulk of the manuscript focuses on the development of the implementation
package (which determinants, which BCTs, etc.), and from my reading, a single researcher not involved in the development (KG-B) performed the prospective directed content analysis to identify BCTs within package (Stage 6).

Conversely, during the method, a series of qualitative approaches were undertaken to determine relevant theoretical determinants (e.g., stakeholder panel meetings, interview analysis) and yet insufficient methodological details were provided per established criteria when reporting qualitative work (e.g., CORE-Q, SRQR). These additional details would be required if the paper is to focus on the development of the intervention content.

Apologies if I have misunderstood areas within the manuscript. I have provided a series of queries and comments below so the authors can understand where my confusion occurred.

Abstract
- 'an implementation package' singular in Aim, whereas plural in Method and Conclusion.
- Method section refers to staged process. Was this a sequential process?
- Results section does not answer the question posed in the Title of manuscript.

Introduction
- Well written and referenced. Two clear research questions under a broad aim. The first question references a single external coder seems a significant limitation, even this early in the manuscript.

Method
Comprehensive approach and yet insufficient information currently provided. Qualitative methods should be described per established criteria for reporting such work.
- Stage 1
  o Perhaps include (or cite a source for) other delivery techniques that could have been relevant for primary setting or were specifically excluded due to available resources would be helpful to those following this manuscript for developing packages.
  o Questionable if trained facilitators are available in primary care settings (unless training a component of the packages?)
- **Stage 2**

  o 11 determinants of TDF (line 132), not 12 or 14?

  o BCT categories 'nominated by three or more' - was the consistency of mapping not evaluated?

  o 5 to 10 stakeholders invited (line 141). How were these individuals identified? How many accepted? Were all 'emerging interview findings' presented to stakeholders? How were these findings presented? By who? How were responses from stakeholders recorded and analysed? By whom? What was included / excluded / adapted based on stakeholder feedback?

  o Section subtitle refers to BCTs yet mapping at BCT cluster/category level. Important that made clear if individual-level BCT or category -level when mentioned in text. For example, I would have expected that the 'Candidate BCTs' (line 145) reviewed was conducted at an individual BCT level, however reference to Stage 2 indicates this was done at the category-level?

  o Are the interview findings mentioned on line 150, from the previous interviews (reference 33)? It is unclear to me as to why further analysis was undertaken of previous interviews after the stakeholder panels.

- **Stage 3**

  o The 'parallel group of patient and public representatives' (line 148) - did they review all QIs simultaneously?

  o Why did the data only inform the feedback reports and not content/template of the other two delivery mechanisms? (lines 156-158)

  o Intervention development team (line 149), intervention development group (line 166). Is this the same group of people or a sub-set? Who is this group of individuals? Presumably all the authors/researchers included (except KG-B)?

- **Stage 4**

  o Should inclusion of text '(Stage 1)' be inserted on line 160 to show how all three stages fed into stage 4?
- **Stage 5**
  - Sub-heading includes piloting the intervention content, but the first sentence indicates piloting the components of the implementation package. What are the 'intervention components' (line 173)? The delivery mechanisms or something else?
  
  - The patient directed checklists is first mentioned here (line 170) - is this an implementation component or intervention content? How were they derived, reviewed and used?
  
  - While the impact of BCTs was not explored (lines 172-173), did pilot participants examine/evaluate the BCTs - perhaps through the semi-structured interviews?
  
  - How many 'brief, opportunistic semi-structured interviews' (lines 171-172) were conducted with who and by who? Were these interviews based on an a priori determined schedule and is it available? Were they recorded? How was information captured, analysed and subsequently used? What refinements were made?
  
  - As 2 of the 3 delivery mechanisms were reviewed via written documents, would 'face validity assessment' be more accurate than 'pilot' to describe the process undertaken here?

- **Stage 6**
  
  - Not clear why two members assessed a sample of delivery mechanisms for BCTs. Was this to determine the method to undertake the independent review by KG-B?
  
  - As indicated earlier, having one person verify BCT presence seems very limited, given the focus of the manuscript title.
  
  - Table 3 presents results from the independent coder (KG-B) - are these the results prior to discrepancies being discussed with LG?
  
  - Were field notes taken / recording undertaken regarding the direct observation of the outreach sessions which could have been included in the content analysis? Given there were four BCTs which were not identified (lines 221-225), perhaps they were delivered verbally?

**Results**

- Reference again to the emerging interview study findings (lines 192-193) - I find this confusing. It sounds like the analysis is incomplete/underway and yet was the analysis not completed for publication previously (reference on line 150)? Reference to 'extended analysis of interview findings' (line 252) - are these the previously published interviews, or those undertaken in Stage 5? Or a combination perhaps?
- Series of meetings for each QI (lines 140-141) included in Method. Additional details required in Results. For example - How many stakeholder meetings, with how many participants representing which stakeholders? Unclear if balanced groups participated or weighted towards certain groups.

- I am unsure how feedback reports could be developed without including 'information about health consequences' or 'credible source'? Are these feedback reports comprised of audit results (e.g., tables of figures) without preamble as to why the audit content was chosen (which would presumably refer to health consequences) nor as to who completed (surely a credible source?).

- Patient factors identified as perceived determinant of adherence by all (Table 1), yet not included in Intervention content determinant of behaviour (Table 3)?

Discussion

Limitations were comprehensive and illustrate a transparent presentation of the work. The difficulties in having to balance research timelines and resources with being able to perform iterative feedback and refinements are identified within the manuscript.

- I find it unusual that the coder did not identify 'discrepancy between current behaviour and goal' from within the audit and feedback reports? Were the populated reports provided for the content analysis to be undertaken, or just the report outline/template?

- Were the results from the mapping exercise similar or different to that outlined by Cane et al and/or Michie et al? (lines 328-330)

- The authors note the limitation that the evidence-based measures/instruments of established psychological theories were not used in the development of the packages. Given the experience of undertaking this comprehensive approach, the limitations noted and the availability of evidence-based/empirically tested content not used in the current manuscript, I suggest that the figure 1 is augmented with a proposed approach that incorporates the expertise of the authors.

Minor

- How many determinants are targeted by the 30 BCTs (line 192)?

- Were the delivery mechanisms adapted or was the content adapted for the delivery mechanisms (line 196)
- 'Unable to verify' is a Discussion point, not Results (lines 224-225).
- 'Fewer BCTs in outreach' is a Discussion point, not Results (line 241-242)
- 'information about health consequences' repeated (lines 249 and 250)
- Figure 1
  o Include the number and title of stages outlined in Method
  o Reference to an interview study (third box) - is this the previous interviews or the ones outlined in Stage 3

- Table 1
  o Column 1 - 1. Which interviewers? 2. And 4. - are these the same data or different? 3. Not clear who the consensus panel comprises an when conducted? Is this the stakeholders?

- Table 2
  o Title indicates results from previously published interview study but text indicates that prominence of determinants conducted after stakeholder panels (lines 150 - 151).

- Table 3
  o Implementation package as a separate column/category to the three delivery mechanisms. I am unsure what the implementation package is distinct from the delivery mechanisms.
  o dot point for present could be in a Note under table, rather than in four headings
  o apostrophe needed 'Information about others' approval (6.3); Diabetes control QI missing from reminders and prompts section
  o include reference to Table 4 in the final column heading (illustrative intervention content)
  o total number of BCTs verified - compared to proposed number?

- Table 4
Patient-directed checklists included but then indicated 'could not be made available.' Were they included in any part of the process within manuscript?

Reminders listed for three QIs (lines 213-214) but only two in table?

Last column - not all prompts and reminders are computerised

Rationale - include "develop an adaptable implementation package"

Education outreach - include note that documents completed through Audit and Feedback process.

- Table 5 - great to include this.
- Consent for publication - no answer (line 383)
- Why are data not available (line 384)?

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An article whose findings are important to those with closely related research interests

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Please indicate the quality of language in the manuscript:

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