Author’s response to reviews

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

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<table>
<thead>
<tr>
<th>Point</th>
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<tr>
<td><strong>Response to the editor Bryan Jeffrey Weiner, Ph.D.</strong>&lt;br&gt;1. Additional details about the methods employed (and in some cases the rationale for the procedures) would improve the clarity of the manuscript. Please use an appropriate reporting standard (e.g., COREQ)</td>
<td>We agree and have addressed these points in relation to comments made by both reviewers and added a table to include the standards for reporting qualitative research (SRQR) in addition to the template for intervention description and replication (TIDieR).</td>
<td>Table 6</td>
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**Response to reviewer 1**<br>2. 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.<br><br>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.<br><br>Overall, the paper was well written, tables were generally helpful in understanding the content and process, and the limitations transparent.<br><br>I look forward to reading the empirical results of the evaluation of these packages<br>3. I do, however, have a number of comments and queries for the authors to consider prior to Form 14/11/2020 10-34 PM | We welcome the positive comments and recognition of the rigorous process we undertook to develop and verify the content of our implementation package for four quality indicators. Thank you. | N/A |

| We appreciate the detailed comments and queries made to improve the usability of our proposed method, and value the | N/A |


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.

4. 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).

We summarised the earlier stages of P12 research undertaken in order to systematically develop the ‘ideal’ content of our implementation package. We have added this distinction to figure 1 as recommended by reviewer 2.

Whilst a single researcher performed the prospective content analysis they had undertaken the BCT-Taxonomy online training and a number of quality assurance steps which we have added to the manuscript.

We agree that additional researchers could vary in their judgements of the presence/absence of BCTs and have added this to our discussion. Figure 1

We have added SRQR as table 6 and text throughout the manuscript.

5. 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).

6. These additional details would be required if the paper is to focus on the development of the intervention content.

Abstract

We have amended text to reflect that we developed an implementation package that was subsequently adapted for four quality indicators.

Throughout manuscript.
'an implementation package' singular in Aim, whereas plural in Method and Conclusion.

7. Method section refers to staged process. Was this a sequential process?

Whilst we planned a sequential process this was not feasible within the timelines and resources for our programme of work. We have amended the text to reflect that emerging interview findings were reviewed by our consensus panels.

8. Results section does not answer the question posed in the Title of manuscript.

This was an oversight. We have added a sentence to the results in our abstract to answer the question posed in the title ‘To what extent can behaviour change techniques be identified within an adaptable implementation package for primary care?’

9. 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.

10. Method

Comprehensive approach and yet insufficient information currently provided. Qualitative methods should be described per established criteria for reporting such work.

11. Stage 1

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.

12. Questionable if trained facilitators are available in primary care settings (unless training a component of the packages?)

We have added a supporting reference to illustrate that there are a range of implementation delivery mechanisms available that vary in terms of their effectiveness, intervention cost, and feasibility within a UK primary care setting.

We have revised the wording to indicate that we commissioned for and recruited experienced pharmacists to deliver educational outreach. In addition we provided two days training.
13. Stage 2
11 Determinants of TDF (line 132), not 12 or 14?
14. BCT categories 'nominated by three or more' - was the consistency of mapping not evaluated?

Apologies for this typographical error, amended to 12.

The consistency of mapping has not been reported here as this was exploratory work to generate a list of ‘candidate’ change techniques. We recognise that there is a tension here between using rigorous and validated methods for each detailed step of intervention development and making sure that we could deliver our research programme for the funder within limited time and resources. We were aiming to strike a balance by transparently reporting what we did (albeit taking on board both reviewers’ helpful suggested clarifications) and focusing on key evaluation questions over the course of the programme (e.g. ultimately including whether the implementation package actually worked).

We have added the following text to the methods and results sections of our paper:

1. “The intervention development team used their knowledge and interview data to identify stakeholders involved in achieving each quality indicator. All invited stakeholders were willing to participate in the consensus process. Emerging interview data (frequency data and illustrative quotes) were presented using PowerPoint by those involved in analysing the interview data. Stakeholders helped us to contextualise our findings and understand how messages could be framed. Field notes were used to record discussion points.”

2. Following stakeholder feedback, computerised prompts were not developed for either diabetes or blood pressure control because they were already widely used. Stakeholders also suggested patient-directed checklists to guide discussions around diabetes and blood pressure control respectively.
16. 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?

17. 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.

18. Stage 3
The 'parallel group of patient and public representatives' (line 148) - did they review all QIs simultaneously?

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

20. 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)?

21. Stage 4
Should inclusion of text '(Stage 1)' be inserted on line 160 to show how all three stages fed into stage 4?

22. Stage 5
Sub-heading includes piloting the intervention content, but the first sentence indicates piloting the components of the implementation

We have amended the text to state that we independently mapped the 12 determinants to one or more BCT categories and then individual BCTs.

We have apologised for the lack of clarity and have amended our text to reflect that emerging interview data were presented at stakeholder workshops and that data were analysed in more depth to draw out the high level themes in reference 33.

We conducted patient and professional stakeholder groups simultaneously and that the research team communicated key messages from one panel to another.

We have clarified that our emerging interview findings informed the development of all delivery mechanisms, but that our extended analyses of core and prominent BCTs informed the development of later feedback reports.

We have now used the term intervention development team throughout.

We apologise for this omission and have amended the text.

We apologise for the lack of clarity and have amended the text to use delivery mechanisms throughout.
package. What are the 'intervention components' (line 173)? The delivery mechanisms or something else?

23. 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?

24. While the impact of BCTs was not explored (lines 172-173), did pilot participants examine/evaluate the BCTs - perhaps through the semi-structured interviews?

25. 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?

This was unclear. We have amended the text to state that these were suggested by the consensus panel.

Pilot participants commented on the acceptability and feasibility of the prototype interventions; they did not evaluate the presence/absence of BCTs.

We have amended the text to state that brief opportunistic semi-structured interviews were conducted by EI in 5 practices with GPs (6), practice managers (2), and practice nurses (3). Participants were asked to comment on the acceptability and feasibility of prototype delivery mechanisms. Field notes were taken and reviewed by the intervention development team.

Refinements were made to the first audit and feedback report and the action plan template.

We only piloted for acceptability and feasibility of delivery, we did not assess the face validity of the delivery mechanisms so have made no changes.

Yes, we have clarified the text accordingly.

We agree and have outlined the rationale, quality assurance steps and implications for future research under point 4.

We have clarified that Table 3 presents the final agreement and that we present Tables 3 and 5.
these the results prior to discrepancies being discussed with LG?

30. 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?

31. 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?

32. 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.

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

Field notes taken during direct observation recorded the feasibility and acceptability of the outreach session. We did not record the fidelity of BCT delivery.

We have amended our figure and text to document the non-linear staged process. We have also confirmed that all interview findings are presented in reference 33.

We apologise for the lack of clarity and have amended the text to state that the team used their knowledge to identify a broad range of relevant stakeholders who all agreed to participate. Stakeholders were representative of clinicians (general practitioners, practice nurses, pharmacists), practice managers, quality improvement specialists, and service commissioners.

This was a finding from our extended interview analyses and stakeholder panels. We were aware of the importance of patient factors but prioritised our effort and resources on changing professional behaviour. We also recognised that there a much larger body of research on changing patient behaviour (e.g. for diabetes) that we could not address within the constraints of one research programme. We did partly try to address this shortcoming by
34. 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?).

35. 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.

36. 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?

37. 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)

We have clarified that we provided data on achievement and an action plan template that asked practice staff to set an appropriate goal. We did not articulate the discrepancy or specifically request that the team did so and although it is possible that the team might do this, they might also explain the lack of achievement away in other ways and not those related to behaviours. As we can only infer that this technique was deployed we did not code for it. Training in BCT coding requires that inferences are not made.

We have added the following text to compare our coding exercise to those of Cane et al.

“We identified many of the same BCTs. In addition, Cane identified two categories of BCTs that we did not, mapping feedback and monitoring and antecedents to knowledge, and antecedents to skills. Whilst these were not included in our
intervention development work we did include shaping knowledge, natural consequences and comparison of behaviour and outcomes to target knowledge. Shaping knowledge, comparison of behaviour and repetition and substitution BCTs were included to target skills.”

We welcome this opportunity and have adapted figure 1.

38. 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.

39. Minor

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

We have noted in our discussion that we did not verify if BCTs targeted intended determinant of behaviour.

P10

40. Were the delivery mechanisms adapted or was the content adapted for the delivery mechanisms (line 196)?

We have stated that the content of the delivery mechanism was adapted to include the vocabulary and experiences for each quality indicator.

P6

41. 'Unable to verify' is a Discussion point, not Results (lines 224-225).

All amended in discussion

P10-11

- 'Fewer BCTs in outreach' is a Discussion point, not Results (line 241-242)

42. - 'information about health consequences' repeated (lines 249 and 250)

43. Figure 1

Include the number and title of stages outlined in Method

Reference to an interview study (third box) - is this the previous interviews or the ones outlined in following this suggestion and reviewer 2 figure 1 recommendations we have added supporting references to figure 1.
Stage 3

44. Table 1

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

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

47. Table 3

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.

48. Dot point for present could be in a Note under table, rather than in four headings
49. Apostrophe needed 'Information about others' approval (6.3);
50. Diabetes control QI missing from reminders and prompts section

51. Include reference to Table 4 in the final column heading (illustrative intervention content)
52. Total number of BCTs verified - compared to proposed number?

53. 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?
54. Reminders listed for three QIs (lines 213-214) but only two in table?
55. Last column - not all prompts

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Table 1

<table>
<thead>
<tr>
<th>Column 1 -</th>
<th>1. Which interviewers?</th>
<th>We have clarified that we reviewed emerging and an extended analyses of interview data.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. And 4. -</td>
<td>are these the same data or different?</td>
<td>We have clarified that this was the clinical and patient stakeholder panels.</td>
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</table>

Table 2

| 3. Not clear who the consensus panel comprises and when conducted? Is this the stakeholders? | Apologies for the confusion. We have amended the wording and clarified figure 1 to show where we varied from our ideal processes. |

Table 3

| 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. | We have added a note to remind readers that packages varied in delivery mechanisms. |

Table 3

| Dot point for present could be in a Note under table, rather than in four headings | Added. |
| Apostrophe needed 'Information about others' approval (6.3); | Added. |
| Diabetes control QI missing from reminders and prompts section | We have noted that these were not developed because of overlapping QI initiatives for clarity. |

Table 3

| Include reference to Table 4 in the final column heading (illustrative intervention content) | We have added this to the final column. |
| Total number of BCTs verified - compared to proposed number? | We are not able to add this detail as the intervention team only coded a sample of delivery mechanisms for one quality indicator. |

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? | We only report the BCT content of delivery mechanisms that were delivered to participants in the ASPIRE trials. |
| Reminders listed for three QIs (lines 213-214) but only two in table? | We apologise and have added risky prescribing. |
| Last column - not all prompts | We have amended the header to Table 4. |
and reminders are computerised prompts and ‘paper-based’ reminders.

56. Rationale - include "develop an adaptable implementation package"
57. Education outreach - include note that documents completed through Audit and Feedback process.
58. Table 5 - great to include this.
59. Consent for publication - no answer (line 383)
60. Why are data not available (line 384)?

Response to reviewer 2
61. Thank you for the opportunity to review this manuscript, which provides an incredibly systematic approach to developing an adaptive implementation package for primary care. I applaud the authors for their thorough and thoughtful approach, and believe that this manuscript will be a great service to the field by demonstrating methods to: 1) select high priority clinical guidelines or interventions, 2) select practical "delivery mechanisms", 3) identify and prioritize implementation determinants, 4) link determinants to behavior change techniques, and 5) report interventions using established reporting guidelines (in this case TidIER). Bravo! I have only a few suggestions for improvement, which I view as largely discretionary.

62. 1) While Figure 1 provides a nice overview of the processes described in this paper, it might be nice to have a table that provides a bit more expanded, plain language summary of the various steps in this process. This table could include references to previous studies (e.g., the interview study), and could actually extend to steps beyond this improvement we have added references to the figure and plain language summaries to increase the accessibility of our work.

Thank you for suggesting this Figure 1

Table 4

We have added that educational outreach was supplemented by Audit and Feedback to the header.

Many thanks for the positive feedback. N/A

P15

All data are presented in the manuscript, no further data are available.

Many thanks for such positive feedback. N/A
study (e.g., the RCTs and process evaluations described). Some of the language in this paper that focuses on TDF and BCTs can be quite technical, and providing this type of table could help readers who are less familiar with these frameworks and taxonomies. Furthermore, this type of table would be a nice summary of the scope of this research effort from start to finish, and provide a nice signal to readers to watch out for the results of the trial(s) and other subsequent publications.

63. 2) Could the authors provide any information about the feasibility of the methods they describe, and any concrete recommendations for when and where they might be appropriate?

We originally suggested in our discussion that intervention developers report potentially eligible techniques. We have added text to state that developers who undertake a content analyses should consider the variation in skills experience of the coder and may wish to have multiple coders and could assess the consistency of verification by coders with different skills and experience. In addition we have noted the challenges of undertaking this work within current funding and research timelines but stressed the importance of iterative cycles to refine interventions.

64. 3) Can more details be provided about how the authors are approaching the measurement of key determinants (i.e., are these studies being designed in a way that they will be able to tell if the BCTs that they have selected are actually addressing the proposed determinants)?

The TDF will be used to analytically compare what we intended to address with what happened in practice. We have added details of the analytic frameworks adopted in the process evaluation.