Reviewer’s report

Title: Intervention planning and modification of the BUMP intervention: a digital intervention for the early detection of raised blood pressure in pregnancy

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Reviewer: Gillian Lancaster

Reviewer's report:

Although this manuscript describes the process of developing an intervention the structure of the paper does not help the reader follow the processes of modification very easily. The paper needs MAJOR REVISION - it needs to be carefully restructured and more detail added to clearly explain the work carried out specifically for this study in the context of the preceding pilot study, any previous intervention development work, and the overarching programme of work (ie where does this study sit on the intervention development and testing pathway).

1. Introduction.

Upon first read of this manuscript it is difficult to understand the sequence of events in this programme of work. This needs to be made very clear in the introduction (and abstract) with more detailed and clearer explanation.

From what I can gather a programme of work has been planned to look at x (how many?) interventions for early detection of raised BP in pregnant women. A pilot study has been conducted in which women were asked to self-monitor their BP at home. The results of the pilot study have indicated poor compliance to self-monitoring and that in order to increase compliance some education materials need to be developed to use alongside the intervention. The aim of this intervention development/modification study is to modify the existing intervention (self-monitoring) by developing additional materials including an app and pilot test them on a sample of women in preparation for the BUMP1 trial.

What is confusing is that it seems a number of BUMP interventions are being tested. Is this correct? If so what are the interventions? Is this one trial testing a number of interventions or a series of stand-alone trials testing one intervention each? It would seem that after overviewing the programme of research only BUMP1 is actually being focussed upon here. Mentioning BUMP2 is confusing and not necessary (page 4).

It would be better to first introduce the programme of work, then the pilot trial results and conclusions leading to this study, then at the end of the introduction state the aims and objectives of this study. Text on page 5 lines 17-37 introducing the PBA, and page 5 lines 59-page 6 line 10 and page 8 lines 1-17 about the pilot study results and conclusions are more suited to be placed in the introduction.
2. Aims and Objectives.

The aims and objectives of this study need to be explicitly stated upfront. The objectives seem to be something along the lines of i) to develop accompanying educational materials to better inform women about the importance of adhering to the self-monitoring intervention, ii) to create and test a means of recording results through an app, iii) to consider possible mediating processes which may affect compliance, iv) to obtain feedback on the development process from a sample of pregnant women, PPI and professionals.

Table 2 lists only 2 objectives and they need more detail eg 'to motivate .....by developing accompanying materials....'; to develop and ensure participant materials are simple....'. The table needs realigning in the light of the full list of objectives.

3. Methods

The methods should only be those to be used in this study and should address how each of the objectives is to be achieved. Any results should go in the Results section. For example was the BUMP1 logic model (page 7) developed as part of this study or was it developed as part of the previous pilot study. It looks like it is developed in this study but how was it developed, what process did it go through (eg. by one person reviewing the literature? by a group of people? by consensus meeting?)? The resulting model (Figure 2) is then the result. What are the methods used to gain feedback from the women - they are mentioned in one sentence (page 9) and need more detail in a separate subsection 'Qualitative data analysis'. A rationale for choosing 19 women to provide feedback needs to be given - and how they were selected? The three sections on page 8 need removing and a subsection (v) 'Iterative qualitative user feedback' adding (to match the flowchart).

There is also mention (page 8) of mediating processes but not how these are to be studied, and outcome data to be collected but these assessments are not presented in the Results. These sections on page 8 need realigning as to their purpose and stated as specific objectives with appropriate detail of the methods used if to be included.

In Figure 1 was the pilot study data not reviewed before the qualitative literature review? Does this need adding to the diagram?

4. Results

The results (of how each objective was achieved) need to be clearly presented in this section, with relevant quotes/feedback from the women. At present there are no results presented of the feedback gathered by each method (focus group, PPI group, participant interview) (eg. quotes or summaries) and no quantitative information about feasibility of mediation/outcome processes (if collected).
Figure 2 - what is BCT - it can be written in full in the heading. In the second column why does it say a) BP monitoring - there are no other interventions listed as b) etc.?

5. Discussion

This needs to bring together the findings for each objective in the context of the creation and feasibility/piloting of use of the materials with the women, and the implications for use in the BUMP1 trial. It would be best written as if in preparation for the BUMP1 trial.

If the BUMP1 trial incorporating the modifications is already underway then this can be mentioned at the end under a heading 'Current stage of BUMP1 trial' including the stage that it is at.

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