Author’s response to reviews

Title: Combining Wireless technology and Behavioral Economics to Engage Patients with cardiometabolic disease (WiBEEP): A Pilot Study

Authors:

Edith Angellotti (EAngellotti@tuftsmedicalcenter.org)
John Wong (JWong@tuftsmedicalcenter.org)
Ayal Pierce (Ayal.Pierce@tufts.edu)
Benjamin Hescott (b.hescott@northeastern.edu)
Anastassios Pittas (APittas@tuftsmedicalcenter.org)

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Author’s response to reviews:

We would like to thank the Reviewers for their valuable comments, which we considered in improving the revised manuscript. Changes in the text are indicated by the track-changes mode and a clean copy is also included.

Response to Specific Comments by Reviewer 1

1. Line 87: It is unclear if multiple clinics or a single clinic was used for recruitment. Were all patients approached (i.e. the first 35), or was there a systematic way to choose who was approached?

Response: We clarified the recruitment process (lines 109-112).

2. Line 140: Please make it a little more clear about how many patients received BP monitoring in the results, prior to this point. It is in the figure but not in the text, so 9 seems a little strange since the table shows 12 people total with no breakdown of who got BP and who did not. Also, it wasn't quite clear that medication could be adjusted for only those in the BP group. Do you have a breakdown of diabetes/hypertension/both in the BP or no BP groups?
Response: In the text (line 172) and in table 2, we specified the number of patients with established hypertension (n=9) who received the BP wireless monitoring. Given the small sample, we did not consider subgroups as diabetes/hypertension/both. We clarified (lines 100-103) that among patients with established hypertension (n=9), anti-hypertension medication could be adjusted. There were not adjustments in diabetes medications during the study period. We clarified in the revised text.

3. Figure 1: The last row is a little strange - it is hard to see that the arrow is coming from the union of the boxes two rows above. I'm not sure the last row is needed. From the row above, you can tell that 9 completed BP + PTM and an additional 3 completed PTM.

Response: As suggested, we deleted the last row.

4. Discussion: Could you indicate whether both PTM and BP monitoring are recommended or would one suffice? What about BP monitoring without PTM?

Response: These are excellent questions but this pilot study cannot answer given that its aim was to evaluate the feasibility and acceptability of combing wireless BP home monitoring and text messaging. A future, larger study should be designed to answer these questions. We modified the last sentence in the Conclusion to indicate this (227-230).

Response to Specific Comments by Reviewer 2

1. Background:
   - Line 55: change 'patient' to 'patients'.

Response: We deleted “patient” to improve readability (line 62).

   - Lines 57-59: might consider alternate phrasing. One option: Effective management of chronic conditions requires patients to initiate and sustain behavioral change and/or medication
adherence over time. Accordingly, there is a growing interest in developing interventions to support patients outside of traditional healthcare settings, as brief and infrequent clinic visits are insufficient to optimize outcomes for individuals with chronic conditions.

Response: We thank the reviewer for the specific text and we changed as suggested (lines 64-68.).

- Lines 60-65: It is not entirely clear to me why mHealth + behavioral economics. Is it because many people do not adhere to mHealth approaches over time and behavioral economic strategies are one strategy to increase adherence? If so, may consider rephrasing to directly make this point. Something like, 'Mobile health technologies are one promising and scalable approach to support patients with chronic diseases. Adherence to such technologies may be enhanced by applying principles from behavioral economics, [define]. Two behavioral economic approaches of particular relevance to mHealth interventions include automatic hovering and nudging. Automatic hovering refers to strategies that... (e.g. *** ) Nudging refers to strategies that... (e.g. *** )'

Response: The reviewer is correct. We studied mHealth + behavioral economics because many people do not adhere to mHealth approaches over time and behavioral economic strategies are one strategy to increase adherence. We edited the paragraph as the reviewer suggests (lines 69-82.).

- Lines 68: The authors state that concurrent use of these approaches has not been studies in T2DM or HTN. Have they been studied in other chronic conditions? If so, please explain briefly.

Response: We added one reference where a somewhat similar approach was tried after acute myocardial infarction (lines 84-86).

2. Methods:

- Lines 75-79: Recommend making this 2 sentences and clearly stating study aims.
Response: As suggested, we split the sentence into two and clearly stated study aims. (lines 93-99).

- Lines 79-80: Use active voice - 'participants attended on in-person visit (baseline) followed by 2 virtual visits (3 weeks, 7 weeks). Also, what is meant by 'virtual'?

Response: As suggested, we changed to an active voice (lines 99-100). We explained what 'virtual' means (lines 100-103).

- How were patients recruited? Approached by study team? Referred by provider? Flyers on clinic wall?

- Inclusion / exclusion criteria would be easier to read if numbered. Inclusion criteria were (1) T2DM...; (2) HTN... etc.

Response: We clarified the recruitment process (lines 109-112) and numbered inclusion/exclusion criteria as suggested.

- Intervention: could you provide more detail regarding the process of creating the bank of messages? Were messages tested in any way before use in the intervention?

Response: We provided more detail regarding the process of creating the bank of messages (lines 129-133). The main idea was to make the text messages actionable and consistent with behavioral economics principles (e.g., get up a walk) rather than simply informative (e.g., exercise is good for you.” Since this study was a pilot, we did not test these messages beforehand.

- Consider subheadings to clearly identify the components of the intervention that relate to "hovering" vs. "nudging"

Response: As suggested, we provided subheadings.
3. Results, Table 2:
- Clinical characteristics - SBP and DBP should be reported as mean with SD

Response: As suggested, we added SD.

- Include baseline HbA1c as this is a study outcome

Response: As suggested, we added the baseline A1c value.

4. Discussion:
- Extremely brief discussion. Feels incomplete. Consider revising as follows:

Paragraph 1: summary of interventions' key findings -- given extremely small sample size, would focus on acceptability / feasibility

P2: place in context of other work -- what's similar / different?

P3: limitations

P4: conclusion

Response: As suggested, we expanded on the discussion. However, given that the study is a pilot, we prefer to be concise and minimize extrapolation.