Reviewer's report

Title: Smartphone apps to improve fitness and increase physical activity among young people: protocol of the Apps for IMproving FItness (AIMFIT) randomized controlled trial

Version: 2

Date: 15 January 2015

Reviewer: Leanne Morrison

Reviewer's report:

This proposal outlines an interesting and valuable research study that has been well thought through and clearly written. The proposed study design will provide an adequate test of a) whether access to a Smartphone app can improve fitness/physical activity levels and b) whether an immersive app (versus non-immersive app) has a greater impact on fitness/physical activity.

However, I suggest a few clarifications that would help to improve the manuscript.

Major Compulsory Revisions:

1. Method: It would be useful to provide a more detailed explanation of why you do not plan to collect objective data on app usage? Relatedly, it would be useful to understand how self-report usage of the apps will be measured (i.e. do the apps designate certain levels that participants can reach and therefore report?). Arguably, participants may not be able to accurately recall their usage of the app over an 8 week period.

2. Method: You have stated that both apps include the same behaviour change techniques. However, it is not entirely clear how similar the actual content is between the two apps and what implication this may have on the results. For example, do both apps advocate exactly the same activities? If one of the apps encourages different activity to the other, might this have an impact on the extent to which improvements in fitness will be observed? It would be useful to provide a more detailed description of the similarities/differences between the two apps other than their immersive design.

3. Method: How/are you going to control access to the two apps and/or measure whether the control group accessed one of the apps (or whether the intervention group accessed both apps)? If both apps are readily available, presumably that means they can be downloaded at any time by anyone?

Discretionary Revisions

1. Background: You have cited data on the prevalence of Smartphone ownership in the US? Is there any data on the prevalence of Smartphone access among young people in New Zealand?
2. Method: It would be helpful to clarify that the incentives provided are to encourage completion of study measures and are not conditional on usage of the app, and how/whether this was made clear to study participants.

3. Method: You state that participants are told that they will be offered both apps at study termination. Do you mean offered free of charge?

4. Method: You state that you expect attrition to be low. What is your basis for this expectation? Do you have procedures in place to minimise attrition?

5. Method: You state that during the fitness test participants will be encouraged with positive feedback. How do you plan to ensure that the feedback provided will be kept consistent across participants?

6. Discussion: The proposed design includes a number of face-to-face contact points between the research team and participants in order to collect objective measurements. Whilst I appreciate the necessity of this, I think you also need to reflect on the limitations of this e.g. usage of the app may be higher/different than ‘real world use’ if participants are aware that they will need to provide feedback and complete certain measures.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests