Reviewer’s report

Title: The effect of home-based low-volume high-intensity, low-volume interval training on cardiorespiratory fitness, body composition and cardiometabolic health in women of normal body mass and those with overweight or obesity: protocol for a randomized controlled trial.

Version: 0 Date: 23 Sep 2019

Reviewer: Emma Cockcroft

Reviewer's report:

This manuscript address an important area of research. The need of this intervention is well constructed and the protocol presents a number of important outcomes which are not often reported in physical activity interventions, but are key health outcomes. I have a number of comments and suggestions which need addressing prior to publication.

Background

* Although the study is well situated in the national health context, detail is also needed on how this fits globally

* Page 5, Lines 78-80: It is not clear why this is included - either more detail need as to why this is not sufficient, or remove from section

* In general this section needs restructuring, sub titles may be helpful.

* Page 5, lines 89-92: "and the literature is sparse on the levels…." This section needs re-writing to improve clarity.

* Could you further justify the potential of home-based HIIT - link to the barriers of PA e.g lack of time, cost etc.

Methods/Design

* Page 10- Outcome measures
  
o You later state the vo2 max will be recorded but it is not clear that this is one of your outcome measures. If not why is it not to be included as an outcome

  o What was the rationale for having BMI as the primary outcome measure and not other measures of body composition such at % body fat?

* Page 12- Blinding
- The decision for unbinding the researcher doing most of the data collection is unclear.

* Page 13: This section would benefit from a re-write in places. For example "participants will also be connected to a heart rate monitor" could be heart rate will be recorded using a chest worn heart rate strap (RX8, Polar Electro). This section also jumps between using face mask to record oxygen consumption to HR and then back to breath-by-breath analysis. Re-write for more logical structure.

* Page 13- Home-based HIIT

- Please include more detail of the exercises, not all readers will know what a burpee etc is - could have a diagram explaining the exercises.

* Somewhere in this section it would be useful to include more detail on recruitment - how will participants be recruited, is there any strategy to recruit particularly the high BMI group?

* Page 15/16 data collection

- Include references for the methods described in these sections e.g. a reference for determining HOMA-IR and others.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

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