Reviewer’s report

Title: Points-Based Physical Activity: A novel approach to facilitate changes in body composition in inactive women with overweight and obesity. A randomised control trial.

Version: 0 Date: 30 Aug 2017

Reviewer: Tom Hazell

Reviewer's report:

General Comments to Author:

This paper examines the effectiveness of a point-based approach to physical activity in order to improve body composition. The authors should be commended for a very interesting exercise program; however, I have several questions across all facets of the study

Specific Comments:

Abstract

Lns 28-32 - I realize there are always word limitations to abstract but might the authors consider some rationale for the points-based program here rather than information about the WHO? Just a thought.

Ln 54 - "overweigh" should be "overweight"

Keywords

- Physical activity should not be a key word as it is in the title
- Sedentary as a keyword?

Introduction

- Nicely written introduction, however, this section would greatly benefit from more detail with how the points-based physical activity program was developed?
- Clearly there is a need for PA interventions that people will participate in and continue to participate in. The authors bring up that lack of time and motivation are key barriers to PA but do not discuss how the PAPB addresses this or how the PAPB was designed to be more
effective than the PresEx. This is a key section that is missing from the introduction in my opinion and I am left wondering why and how the PAPB was developed.

Methods

Lns 156-173 - Much more detail is also required on the PAPB in this section.

Lns 157-163 - What were these two modes of exercise? Why only two? Seems a little unfavorable to only identify one or two modes of exercise for the PresEx vs the table of different activities for the PAPB?

Lns 162-166 - This table of activities for the PAPB should be provided. It is extremely important to understand the viability of this training protocol. The text mentions Appendix 1 but nothing was provided? I only have 1 supplementary file and that is the CONSORT checklist.

Lns 170-173 - What was said to the participants when contacted that encouraged adherence?

Lns 194-198 - What was the reliability of the DXA device? I imagine it was calibrated each day before data collection. This process and the CVs of the phantom scan should be provided.

Lns 207-209 - Was this activity diary an open book that participants wrote down everything they did each day? Some more details on how the participants were instructed to fill this out should be included.

Lns 209-214 - Were the participants instructed to wear this all day, for 10 h per day, or provided any details on wearing this?

Lns 215-218 - Were any other instructions provided to participants with regards to their 3-day food record? Most people are not familiar with doing this so instruction on how to measure or quantify the food they are eating is necessary.

Lns 224-226 - Should probably mention that only those participants that wore the accelerometer for 10+ h could be included in analysis.

Lns 219-229 - How were effect sizes calculated and how the "strength" of that effect size was qualified (strong, moderate, weak) should be included here.

Ln 200 - Shouldn't "standiometer" be "stadiometer"?
Results

Lns 237-246 - Based on the table, body weight was not different at baseline so why was change from baseline analyzed in addition to comparison of means? I can understand why using change from baseline was important where baseline values were significantly different but in this case, it seems redundant. Also, shouldn't all variables begin with the interaction effect? That is the most important statistic.

Lns 247-252 - Table 1 illustrates none of these differences?

Ln 250 - Why is this Figure 2b when it is introduced before Figure 2a? Further, isn't this data in Figure 3a and 3b not 2a and 2b?

Ln 255 - Change from baseline data is not in Figure 1, that is the Consort Diagram.

Lns 258-262- Similar to my comment above, why analyze change from baseline data if there was no significant difference at baseline?

Lns 263-267 - Same as above here. This redundancy just increases the length of the results section making it more difficult to maneuver through.

Lns 279-280 - Why only present the self-reported PA minutes for PresEx and PAPN? What about the CONT groups? Did all individuals complete the activity diary sufficiently? Further, there must have been a great amount of variability in that 25 min more activity in the PAPB was not significant. Can that authors elaborate on this? Likely suggests that some were extremely active and some were not so active but this is of interest as the body composition results as discussed in the discussion section seem to suggest the improvements in body composition in the PAPB group were due to the activity. Further, some indication of the minutes for each of these % should be in the table or in the text.

Lns 290-306

- How reliable are these data? The CONT group had just over half the participants complete the 3 days while the two PA groups were between 70-80% completion rate.

- The values for the PAPB don't line up. The PAPB group decreased their energy intake 445 kcal but when you add up the reductions in all 3 macronutrients you get 470.6 kcal (31.6 from PRO, 171 from FAT, and 268 from CHO). There is also an issue with the PresEx group as the overall change in energy intake is a 30 kcal reduction but CHO intake didn't change, FAT actually went up 27.9 kcal and PRO went down 29.2 kcal which equates to very little actual change in energy intake. The values for energy intake are much closer to the macronutrient changes for CON (226 vs 227.1 kcal).
Interesting that there was very little change in PRO intake on a per kg basis across groups. Seems both PA groups decreased PRO intake slightly (~0.08 g/kg).

Though the "decrease" of 500 kcal is not significant, the focus seems to be on the significant reduction in fat intake though there is an almost significant reduction in CHO (P=0.058) that doesn't seem to be addressed in the discussion. The PAPB group decreased fat intake ~19 g (171) and decreased CHO intake 67 g (268 kcal) which is actually more calories than the fat decrease, and therefore potentially more important to the improvements in body composition than the fat change. The PAPB also slightly decreased PRO intake 7.9 g (31.6 kcal). How do the authors interpret this? Overall it looks like the PAPB group was more engaged in both diet and exercise than the PresEx group and that could be affecting the results and interpretation.

Discussion

Overall I find the results of this study valuable as this appears to be a viable PA intervention, however with that said I feel that the data is a bit over-interpreted in the discussion and several sections should be "toned down". While the data appears to demonstrate the participants in the PAPB group improved body composition, this is not clearly accounted for by PA alone. Further, one could argue that the participants in the PAPB group made more lifestyle changes over the course of the study vs the PresEx. This could certainly be because the PAPB was a more viable intervention for them but I'm not sure the data presented can expressly say that. I want to reiterate that the data is very interesting but caution some of the interpretations.

Lns 371-318 - How do the changes per week relate to this shorter duration study? The greater magnitude change in a 24 week study compared to a 12 week study is potentially due to the longer duration.

Lns 310-334 - Should there not be a mention of the dietary data early on in the discussion as that may have played an equal or even greater part in the body composition improvement?

Lns 349-353 - While this data is certainly hard to interpret based on low subject compliance, the PBPA group certainly appear to have increased their light PA time (~4%), slightly increased their MVPA (~1%), and decreased their sedentary time (~4%) basically replacing sedentary time with light PA. The PresEx group appeared to have increased their MVPA (~3%) by slightly decreasing their light PA (~1%) and their sedentary time (~2%) so they basically replaced some light PA and sedentary time with MVPA. If a 4% reduction in sedentary time is ~42 min, then a 2% reduction in sedentary time is ~21 min and still a potentially important amount of time. When taken in the context of the body composition data it appears to suggest that more light PA is better than MVPA which is of course a bit difficult to understand. However, in light of the dietary intake data where the PAPB group decreased energy intake vs no change in the PresEx, I
believe this suggests that the body composition changes in the PAPB vs the PresEx group is due to the additional reduction in energy intake, not solely the exercise (or even more likely due to the dietary changes rather than the exercise). This appears even more founded when the PresEx group maintained their body composition vs the CONT group. There is also nothing about the low subject compliance on the objective measures of PA.

Lns 368-375 - This might want to be revised based on my comments to the nutrition data in the results.

Lns 382-386 - This information is more evidence that a stronger rationale for the PBPA in the introduction is needed.

Lns 393-394 - Why not in following limitations section? I would also argue that a study focusing on just females is not a limitation. As women are often underrepresented in exercise physiology research, that is actually a strength of this study and only "limits" its generalizability to men.

References

Reference 26 has "Chief" spelled "Cheif".

Table 1

Difficult to compare data... perhaps this could be organized by group rather than y time? Lots of data in here. Why was body fat % omitted?

Table 2

Perhaps the minutes associated with these % could be added.

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.

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