Reviewer’s report

Title: Physical activity intervention for emotional & cognitive functioning in breast cancer patients receiving chemotherapy

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Reviewer: Christine Friedenreich

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General Comments:

The authors present a novel physical activity intervention that they are proposing in breast cancer patients undergoing chemotherapy that is aimed at improving their emotional and cognitive functioning after treatment. This area has not been adequately researched to date, hence, this study will be a welcome addition to the scientific literature.

Some specific comments are provided for consideration by the authors.

1. The authors are proposing a pseudo-randomization in this study which is not justified or explained in any detail. This study design decision is crucial and could severely limit the results from this study. Hence, more detail and justification are needed, or, better yet the authors should consider using a proper randomized controlled exercise intervention trial design.

2. The home-based walking intervention appears to have one weakness. The authors suggest that the participants will be asked to "reflect upon their achievements or shortfalls from the previous week and to take these into consideration by modifying their goals to ensure they are realistic and achievable". The goals for an intervention should be set out by the study design and the investigators rather than allowing participants to decide what they will be doing in any given week of the trial. There should be a clear protocol of increasing intensity, frequency and duration of activity in the ramp-up period and then a maintenance of the exercise prescription for the duration of the intervention. Hence, this section needs either further clarification or some modification to ensure that there is some standardization in the exercise prescription for all study participants in this trial.

3. It is unclear why the exercise intervention starts mid-way through treatment rather than at the outset. It is commonly understood that there is a cumulative effect of chemotherapy on patients' wellbeing and physical function. Hence, it would increase the likelihood of success of this trial, if the exercise intervention were to begin before treatment or at least at the same time as treatment onset. In so doing, the participants would have the opportunity to begin exercising whilst they are still feeling relatively good and before the effects of chemotherapy become more severe.
4. Further to point #2, the walking schedules are self-prescribed - does this point mean that the participants are allowed to walk whenever they wish? If so, that is fine. However, if it means that the actual weekly exercise prescription can be modified by the participants, there could be problems with exercise adherence and achieving the full exercise prescription.

5. The statistical analysis does not include any discussion of an ITT or per protocol approach, nor is there any inclusion of mixed linear regression models. Indeed, the statistical analysis section could be enhanced and more detailed throughout with more explanation of what will be undertaken to address all the main questions being examined in this trial.

6. The authors need to ensure that they have provided all of the details of their study methods as required for the CONSORT guidelines. It is recommended that they consult the checklist to ensure that all details are presented here.

7. The manuscript could use some revision to improve the overall English writing style. Some problems that were encountered included long sentences, difficult grammar, split infinitives, the use of "this" without a noun after it, the use of "upon" instead of "on" in several instances. The language throughout could be tightened and made more precise.

8. The paper would be enhanced if a flow chart of study methods was included.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

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.