Reviewer's report

Title: Using a single question to assess physical activity in older adults: A reliability and validity study

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Reviewer: Nicola Kayes

Reviewer's report:

1. Is the question posed by the authors well defined?

This paper aimed to explore the test-retest reliability, convergent and discriminant validity of two single item physical activity questions in a sample of community-dwelling older adults. The question was well defined and clear. However, the background section providing the rationale to this question was limited. Some specific concerns include:

i. It drew on only a limited number of references. There is a significant amount of work ongoing in the field of physical activity measurement and so it seems crucial that this study be considered in the context of that literature.

ii. The authors introduction to the construct of physical activity was relatively vague given there are explicit definitions which are commonly adopted in the literature e.g. Caspersen et al., 1985

iii. The study was not set in the context of existing work already grappling with physical activity measurement in older adults e.g. what distinct aspects of physical activity does one need to consider when measuring physical activity in this population?

iv. The way the authors have classified some existing methods of measurement seems a little odd e.g. cardiorespiratory fitness as an observer-based method (I would suggest this is a physiological marker and is at best a proxy measure of physical activity); psychosocial rating scales as a self-report method (I would not classify this as a measure of physical activity at all)

2. Are the methods appropriate and well described?

The methods were adequate to answer the study questions for the most part. I do have some concerns which are listed below:

i. I think the study was limited by the fact that the study was not designed to be a validation study but rather was an added component to a larger study and included after the event. The authors acknowledge this was not ideal. The main reason why I see it as a limitation is that it limited the measures available to test convergent and discriminant validity. I am not convinced that measures of physical function are appropriate. People with the same level of function frequently engage in different levels of physical activity (capacity does not equal performance). Preferably convergent validity would have been tested against a
comprehensive physical activity measure e.g. the Physical activity scale for the elderly (PASE) developed by Washburn et al.

ii. The time between administration of the validation measures and physical activity questions was 37 and 33 days (see results, paragraph 1) - this is a significant difference, particularly in an older adult population whose health and function is generally volatile and changeable. The potential limitations of this were not discussed.

iii. There was no detail re: how the 43 participants who took part in the test-retest reliability component of the study were included e.g. random selection or other? (see methods, 4th paragraph)

3. Are the data sound?

Yes, appears so.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

Yes.

5. Are the discussion and conclusions well balanced and adequately supported by the data?

For the most part. Though I hesitate because:

i. I have concerns about the robustness of design for reasons stated above.

ii. Given the complexity of physical activity measurement demonstrated in the many attempts to get it right in the literature I have reservations regarding the use of a single question to measure physical activity. While I acknowledge the authors argue that there is a place for them in certain circumstances, I don’t think the authors give adequate caution to their potential use and their limitations.

iii. Some debate needs to be had regarding the merits of a relative versus an absolute measure of physical activity.

iv. Given that there is clearly a number of similar approaches already available (the authors refer to several others) I think some clear idea of what the authors believe to be the novel contribution to the field would strengthen the paper. Unless this is developed further, I find it difficult to see how this research advances knowledge in the field.

6. Are limitations of the work clearly stated?

For the most part other than the point already made above.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?

Yes

8. Do the title and abstract accurately convey what has been found?
Yes

9. Is the writing acceptable?

Yes. There is one section that is a little confusing (methods, 3rd paragraph). Some of the information about larger study clouds the details here so some refinement of this would ensure clarity I think.

- Major Compulsory Revisions
  a) Please correct information re: existing methods of physical activity measurement (background, 3rd paragraph)
  b) Please include some consideration of the implications of the administration delay between validation measures and physical activity questions
  c) Please include detail re: how the 43 test-retest reliability participants were selected

- Minor Essential Revisions
  a) Please insert references into the background section to support your points.
  b) Please refine 3rd paragraph of the methods section for clarity as per comments above

- Discretionary Revisions
  a) Setting this work in the context of existing literature a little more, particularly with regards to the rationale for the work would strengthen the paper.
  b) Including some further discussion relating to the points noted above in q. 5

**Level of interest:** An article of limited interest

**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