Reviewer's report

Title: Development and testing of a past year measure of sedentary behavior: the SIT-Q

Version: 1
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Reviewer: Charles E Matthews

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This was a useful report that described the development and testing of a comprehensive sedentary behavior questionnaire (SIT-Q) designed for use in epidemiological research. In general the study was well designed and the methods employed were acceptable, including use of a 7-day diary as a criterion measure. While the diary relies on self-report rather than possibly more objective accelerometer-derived information, the strength of the diary lies in its ability to evaluate specific types of sedentary time. This is a useful report, but several issues should be addressed if the paper is to be accepted for publication.

Major Compulsory Revisions

First, based on reading the text, the study design is not at all clear. Add a Study Design paragraph and reference the Figure provided (in the text) to help clarify. Currently, much of the study design information is interspersed in the Methods section in various places. It’s hard to follow/understand the study design.

Second, please increase the description of the SIT-Q in the Methods section. How many domains were initially targeted and why? How many questions/items were included in each domain? Since the major changes were made in response to the Cognitive Interviews (vs. the “experts”), perhaps the initial description of the SIT-Q that entered Cognitive and psychometric testing could be included in the SIT-Q Description part of the Methods. What is the time-frame for the SIT-Q (not clear from reading the Methods)?

Third, the 7-day Diary.

A. Describe the 7-day Diary completely in its own stand-alone section/paragraph. Currently, salient details about your only criterion measure to estimate validity of the SIT-Q are scattered all around the paper (e.g., definitions of sedentary time via the diary, use of two administrations to estimate validity, consideration of week- and weekend days, etc).

B. The sitting data from the criterion measure is vital to understand the utility and comprehensiveness of the SIT-Q, yet it is very hard to understand what the sitting time values from the criterion measure looks in this population. Table 3 is close (I think) but it’s not that clear in the end. Please add a descriptive Table 1 for your study participants and include the mean sitting time data from the Diary in this table, for overall sitting, and the summary measures that match the SIT-Q categories. Table 3 appears to be the result of an analysis of Diary data that was
matched (by item/questionnaire content), which is appropriate for the validity analysis. Was the ALL of the sitting reported on the Diaries, or just the sitting that matched the SIT-Q items? Please report in Table 1 all of the sitting reported on the diaries (if you have not already done so). This could shed light on how comprehensive your survey may be (vs. capture of open ended sitting information via the Diaries).

C. Two definitions of sedentary behavior were operationalized using the diary. Which one is closest to that used for selecting items for the SIT-Q? What MET value did you use to define sedentary time (or maybe I missed it)? Why didn’t you utilize the conventional definition that uses a combination of posture and the energy cost of the activity?

Clearly it will not make too much of a difference. You might add a sentence in your discussion or methods to indicate why you didn’t use the combination definition.

Fourth, Page 13, first paragraph. Much of this reads like the Methods section for Cognitive testing. Please revise and try to describe your methods in one place and results in another. Currently they are scrambled together and it makes for tough reading, and there is not a specific place the reader can go back to to get information about the methods employed.

Fifth, a weighted Kappa appears to have been used (vs. conventional/unweighted Kappa), but this isn’t that clear in the Statistical section. Further, please indicate how the kappa was weighted for partial credit for a close re-test (if it was).

Sixth, Table 3. Present (in the text) the mean differences reported in Table 3 and comment on these results in your Discussion. Currently, only the correlations are considered. Why are the mean differences consistently negative for meals, transport and work, but positive for leisure-time sitting? Do these differences jibe with your cognitive testing results? Does this mean that non-leisure was underestimated by ~2 hrs/d and leisure sitting was overestimated by about 2 hrs/d, since total sitting time between SIT-Q and the Diary was about the same?

Minor Essential Revisions
Page 14, last paragraph, second sentence. It’s not clear if these values are for the SIT-Q or the Diary.

Page 15 and 16. The citations for Tables 2 and 3 seem to be reversed.

Page 16. For Bland-Altman plot, indicate which instrument is being evaluated and how far apart the measures were taken.

Page 17, Discussion, line 9-10 (of Discussion). Specify the main issues that were addressed in the “wording” in the SIT-Q.

Page 20, Strengths. Add that you used the mean of two 7-day Diary measures as a criterion measures (which should reduce intra-individual variation in your
criterion measure). Also, note that your choice to use a Diary (vs. accelerometer) allowed you to estimate the validity of domain/type-specific sitting items.

Page 20, Strengths. Why does estimating changes in the context of an intervention enter the discussion here? That's an objective that is more broad than you outlined in your Introduction.

Page 20, Conclusion. “acceptable measurement properties”. Can you be more specific about which properties and for which goal (epidemiologic studies need to do what with their exposure data?)?

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

**Quality of written English:** Not suitable for publication unless extensively edited

**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.