Author's response to reviews

Title: A qualitative study of older adults' responses to sitting-time questions: do we get the information we want?

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Author's response to reviews: see over
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Dear Editors,

We are pleased to submit a revised version of our manuscript entitled ‘A qualitative study of older adults’ responses to sitting-time questions: do we get the information we want?’.

Our detailed point-by-point responses to the issues raised by the reviewers are given below and changes in the manuscript are indicated using track changes. Thank you for considering our revised manuscript for publication in BMC Public Health. We look forward to your response.

With best wishes, on behalf of all co-authors,

Kristiann Heesch, DrPH
Reviewer: Harriet Wittink

Reviewer's report
This is a well written, interesting paper.

Minor essential revisions
1. I feel it is a lost opportunity to not include subjects with low educational status in the sample. As you have not, could you please comment in this in your discussion section (or strengths and limitations section)?

Participants were purposefully selected to ensure representation of different factors, including education levels. Although the majority of the people who volunteered for this study were highly educated, 11% of the sample did not have an education higher than a high school diploma. We acknowledged that this is a limitation in the section ‘limitations and strengths’ on page 20: ‘Although participants for this study were purposefully selected, the generalizability of the findings may be limited, because participants were generally well educated, cognitively healthy and reported good overall health.’ To highlight the importance of including subjects with low educational status in the sample, we have added the following sentence to the discussion section on page 21:

‘Because education levels could influence questionnaire comprehension [14], future studies may want to target less educated people, in order to get a better understanding of how this population responds to sitting questions.’

2. page 20: reference Beatty and Willis needs to be reformatted

This reference is now formatted as per the BMC Public Health reference style.

Discretionary revisions
1. Pg 21 the sentence "Another explanation... difficulties with the domains" is difficult to understand. Could you please rephrase?

We agree with the reviewer that this sentence was difficult to understand and we have rephrased it as follows:

Another explanation could be that while accelerometers register sedentary activities in all domains (e.g., leisure, work, transport), self-report measures often assess sitting time in only some domains (e.g., PASE asks about leisure-time sitting only).
Reviewer: Rachel Colley

Reviewer's report

Major Compulsory Revisions

1. **Abstract:** The conclusion in the abstract does not match the full conclusion in the paper. The results of this study show major problems with using self-report sitting time questions in older adults. This is well explained in the full discussion of the paper; however, reading the abstract alone leaves the reader with the impression that self-reported sitting time provides reasonable estimates. This is not supported by the findings which clearly show major confusion with the questions in this age group.

   We thank the reviewer for alerting us to this discrepancy. We have now changed the conclusions in the abstract to match the full conclusion in the paper as reported on pages 22-23, as follows:

   ‘The accuracy of older adults’ self-reported sitting time is questionable given the challenges they have in answering sitting-time questions. Their responses to sitting-time questions may be more accurate if our recommendations for clarifying the sitting domains, providing examples relevant to older adults and suggesting strategies for formulating responses are incorporated. Future quantitative studies should include objective criterion measures to assess validity and reliability of these questions.’

2. **Discussion:** Further discussion of alternative measures of sitting time should be included. The results of this study suggest new tools and approaches are needed if we are going to have valid and accurate estimations of sitting time. The authors allude to the fact that accelerometers pick up more sedentary behaviour as they can capture the many periods of time throughout the day that respondents cannot recall. The conclusion of this paper should lean more towards the use of objective measurement or at the very least, using time use diaries rather than questionnaires. This suggestion (combined use of inclinometers and accelerometers) is alluded to in the middle of the discussion (page 21, end of 2nd paragraph); however the final conclusion of the paper still calls for revision of the PASE and IPAQ questions. The recall of something as ubiquitous in the day as sitting is difficult and this is compounded by the fact that the language of the questions forces people to think about the previous week (which could be quite variable between days) or a typical day (again, where day-to-day variability within a person makes it hard to accurately describe sitting behaviour). Self-reported MVPA is very weak as a measure but at least this is asking about specific activities. Sitting time is such a vague and all-encompassing entity that the authors need to consider (or at least discuss) whether we are asking too much of a questionnaire to provide an accurate summation of sitting time.

   This was a qualitative study aimed at documenting older adults’ understanding of sitting-time questions, using cognitive interviews. As the aim was not to compare and discuss differences between self-reported sitting time and objectively measured sedentary time, we did not include
objective measures of sedentary time in this study. Because the discussion and conclusions should be supported by the methodology and results, we feel that a more extensive discussion of alternative measures of sitting time and a conclusion leaning towards the use of objective measurement are beyond the scope of this paper.

However, we do agree with the reviewer that the agreement between self-report and objectively measured sedentary time is important. We therefore included in the discussion section the paragraph ‘Where to from here: continue to use self-report sitting-time measures like the IPAQ and PASE sitting-time questions?’ In this paragraph, we use the results of our qualitative study to hypothesize about explanations for the generally low to moderate agreement between self-reported sitting time and objectively-measured sedentary time. In the revised manuscript, we also cite a recent paper on the measurement of sedentary time in population studies in the discussion section (Healy et al, Am J Prev Med, in press). Although we agree with the reviewer that alternative objective measures may provide more accurate estimates of sitting time, self-report surveys are still the most frequently used assessment method in surveillance and cohort studies. The above mentioned paper by Healy et al. recommends including both self-report and objective measures of sedentary time in population studies. We have added this to the discussion section on page 22:

‘Self-report questions are convenient and inexpensive to use and therefore suitable for large population studies [6]. Furthermore, studies have shown that self-reported sitting time is associated with a range of health outcomes [3,4]. A key recommendation from a recent review on the measurement of sedentary time was for population-based studies to include both self-report measures and device-based measures (Healy et al., 2011). Given the frequent use of sitting-time questions in these large studies, it is important to be aware of problems with self-report sitting-time questions and to improve these questions to ensure we collect the most accurate self-report sitting-time data possible.’

Given the frequent use of sitting-time questions, we feel it is important to provide suggestions for improving these questions. Furthermore, our suggestions are supported by the qualitative methodology and the findings of this study.

Another discussion point worth exploring is the question of whether we should be trying to capture all sitting time or just ‘unhealthy’ sitting time. Sitting whilst eating isn’t a behaviour we would ever intervene on, while watching excessive amounts of TV likely is. The reporting of specific sedentary activities that could be intervened upon (e.g., watching TV) might be more useful in the long run and may also prevent confusion in the data collection process because participants wouldn’t get frustrated with trying to remember so many discrete sessions of sedentary behaviour throughout the day. It appears as though in this population that TV watching, passive transport and computer use might be behaviours of interest to target in time use diaries or questionnaires. It is good to see on page 22 that the authors discuss the need for domain-specific questions. It is therefore clear that they acknowledge the challenge of getting total daily sitting time. There is also a lack of background provided about how other methods can get at sitting time (e.g., inclinometers/accelerometers). The work of James Levine is non-existent in the review of the literature and this is an oversight
when we’re talking about sitting time in adults. Would this be appropriate to use in older adults?

From a physiological point of view, the context of sitting (i.e. ‘healthy’ versus ‘unhealthy’ sitting) does not make a difference to the metabolic processes taking place when people are sitting. However, we do agree that from an intervention point of view, the sitting context could make a difference. We are aware of the work of Professor Levine on NEAT, which mainly focuses on the hypothesis that NEAT is pivotal in the regulation of human energy expenditure and body weight regulation. We acknowledge the importance of Professor Levine’s work for the field of inactivity physiology/sedentary physiology, but we feel a reference to this work is less relevant for a qualitative paper on self report sitting-time questions used in population-level surveillance.

**Minor Essential Revisions**

1. Page 5, data collection protocol: The last 2 sentences of this section are confusing. Once sentence says the total sample of participants was used then the next sentence makes a statement suggesting a sub-sample of something was used. Please clarify.

This has been clarified as follows:

‘For the current analysis of responses to sitting-time questions, cognitive interview data from all 55 interviewed participants were used. This study expands our previous analysis of IPAQ, which used a subsample of these 55 participants [15].’

2. Multi-tasking in sitting time is alluded to in some of the respondents’ answers yet this issue is not discussed as a limitation to using self-report for sitting time. In other words, how can you possibly quantify time spent sitting while knitting and watching TV. What if people report this as two separate ‘sessions’ of sitting rather than a single session?

Although several people reported doing multiple sitting activities at the same time, none of them reported this as separate sessions of sitting rather than a single session. We therefore have not discussed this issue.

**Discretionary Revisions**

1. Page 4, Participants: replace ‘purposively’ with ‘purposefully’

*We have replaced ‘purposively’ with ‘purposefully’ throughout the manuscript.*

2. Literature review: Consider citing a new review paper on sedentary physiology by Tremblay et al., (2010).

*We have now cited this review paper in the introduction section.*

3. Page 20, line 2: reference style is not numbered “(Beatty and Willis, 2007)”.
This reference is now formatted as per the BMC Public Health reference style.

**Review Questions**

- The research question posed is well defined. The authors clearly state their purpose of understanding older adults’ level of understanding of sitting time questions in existing physical activity questionnaires: IPAQ and PASE using cognitive interviewing.

- The methods are well described and adequate detail is given.

1. No sample size justification is provided in the methods. Can the authors expand on this in their methods?

The following information has been added to the methods section on page 4:

‘Previous research using cognitive interviewing methods has indicated that the number of problems identified in a questionnaire is associated with the sample size, with the highest number of uncovered problems for a sample size of 50 [27]. To collect useful cognitive interview data from at least 50 participants, we recruited 55 community-dwelling adults, aged ≥65 years, from Brisbane, Australia.’

- Data reporting adequate.

2. The discussion and conclusions are well supported by the results; however, the discussion that objective measures might be a necessary alternative to measure sitting time should be included in the conclusion/discussion section of the abstract. It isn’t until the very end of the full discussion that any mention of objective measures is made.

We kindly refer the reviewer to our reply to ‘major compulsory revisions’ number one above.

3. The limitations of the work are explained but could be expanded further. A systematic review by Prince et al. (2008) comparing direct and self-report measures of physical activity could be cited. A similar comparison for sedentary behaviour would be useful and this paper would be a good place to suggest this as a piece of future work needed in this field.

We have now cited the following paper in the discussion section: Measurement of Adults’ Sedentary Time in Population-Based Studies. Healy GN, Clark BK, Winkler EAH et al. Am J Prev Med, in press. This paper provides an overview of reliability and validity of several sitting-time questions against objective measures.

- Title is appropriate.

- The writing quality is very good.