Reviewer’s report

Title: Physical activity in older people: a systematic review

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Reviewer: Cheryl Der Ananian

Reviewer’s report:

This article summarizing the findings of studies examining the prevalence of physical activity in older adults is an important study. It synthesizes and provides information about the prevalence of physical activity globally, a novel contribution to the field. It highlights some of the major issues regarding methodological issues in measuring PA. However, I have some reservations about the study and the ability to interpret its findings in a meaningful way.

Major Compulsory Revisions:

1. Methods- Why is the methods section at the end of the paper after the conclusion section? It belongs before the results and discussion section so that readers can comprehend what the inclusion/exclusion criteria were for studies to be included in the review and interpret the generalizability and validity of the findings. Related to this, the authors should identify how many studies the search resulted in and how many were excluded with the primary reasons for exclusion. This information may be in Figure 1 but I was unable to read the figure (technological issue). It should be noted that in the paper you refer to figure 2 when describing the study selection process when it is figure 1.

2. Overview of selected papers- The authors indicate that the main findings of the studies are reported in Tables 1 and 2- this is incorrect. Its tables 3 and 4. Please check the entire paper to make sure there is consistency between the tables/figures listed in the paper and the actual tables and figures provided.

3. Results and Discussion- PA recommendations or guidelines. In this paragraph, the authors described grouping the studies into whether they adopted higher or lower levels of PA based on stated weekly PA frequency requirements. It is not clear why this was done or what it adds to the review. It is not clear how the authors made their decision regarding high or low activity based on the guidelines either. The distinctions seem arbitrary and many of the guidelines overlap (eg.g the PAGA guidelines recommend at least 150 minutes of moderate intensity PA or 75 minutes of vigorous PA and so does the CDC_ACSM as defined in your paper). I am also not sure what the Y or N means- does this mean that the studies used the guidelines or met the guidelines?

4) Self-reported PA- Again, I am not following what the authors are trying to say with the higher versus lower levels of recommendations. This paragraph needs to be revisited. In the last sentence "using the lower criteria, sufficient PA in 9 other studies increased from..." it is not clear what 9 other studies the authors are referring to- they indicated 24 used the lower criteria. Is there a sentence
missing. I can see where the authors might be heading—perhaps they are trying to say which guidelines were used as the criteria for meeting the recommendations influences the % of people classified as meeting the criteria. However, this is not clear as written.

5) In the paragraph, residential differences in PA—did the two studies described by the authors measure the same constructs of physical activity? In other words did they both include all PA or just LTPA? Could this be the reason for the discrepant findings?

6) In the PA prevalence across age groups, what were the cutpoints for older versus younger old? This would help with interpretation of findings. The first sentence also needs to be reworded—it is a bit of a run-on sentence. You also refer to Figure 1 in the last paragraph of this sentence and it should be figure 2.

7) In the paragraph, PA prevalence trends over time, did the authors verify that the same PA module was used across the BRFSS studies?

8) In the discussion section, who is the reference group identified in the first paragraph? Citations need to be added in several places. Did only one study find males to be more active? Did only 2 studies find men to be more active? In general, for the whole discussion section, what are the implications of your findings? What should be done to resolve discrepancies? What do the findings imply for the field of physical activity measurement? What improvements or changes need to be made? What are the next steps? The authors rehash many of the findings but don't necessarily provide the public health implications of their findings or how to advance the field. This needs to be addressed.

Minor essential revisions:

1) Overview of selected papers—The authors indicate that the main findings of the studies are reported in Tables 1 and 2—this is incorrect. Its tables 3 and 4. In the following paragraph, the sentence Forty nine papers.... is not clear. Specifically after the four reported longitudinal studies there is a statement in parenthesis, each had 6, 5, 3 and 2 cohorts that needs to be reworded. I think that you are trying to say that the cohort size ranged from 2-6 cohorts. Finally, in this same paragraph, you said that the number of studies conducted each year was relatively constant. This is not consistent with the data you reported—e.g., 33 studies conducted between 2000 and 2004 y and only 7 from 1995-97.

2) Overview of selected papers—paragraph 3, last sentence—are the authors trying to say that physical activity had to occur in bouts of at least 10 minutes for to be included in some studies while other studies did not utilize this criterion?

3) An overview of selected papers—paragraph 4—in the sentence about PA volume, when the authors discuss time spent in moderate to vigorous activity from accelerometers is this based on count data? Were the cut points consistent across studies? This should be described too.

4) General PA prevalence in older adults—the authors indicate that 20 studies excluded household PA while 14 included household work in their assessment of LTPA. Did this make a difference in whether people met the recommendations? Related in the studies that reported all domains of PA, what was the range of
people meeting the PA recommendations?

5) The last sentence of the 1st paragraph of the section titled objectively measured PA needs to be re-written. It is not grammatically correct. Related, the first sentence of the next paragraph needs to be reworded. In this sentence the authors are trying to say they identified 2 studies that directly compared the results of objectively and subjectively measured physical activity but it does not read this way.

6) Figure 2 has no labels on it. The figure needs to have a title and the graph axes need to be labeled.

7) I would suggest reading the paper in its entirety for grammatical concerns. There are numerous places where there are grammatical issues. I have already identified several but would kindly suggest examining it again.

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