Reviewer's report

Title: Awareness of physical activity in healthy middle-aged adults: A cross-sectional study of associations with sociodemographic, biological, behavioural, and psychological factors.

Version: 1
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Reviewer: Emily Knox

Reviewer's report:

This paper explores the personal characteristics associated with awareness of personal physical activity level. The paper benefits from a good sample size and the use of objective physical activity data. However, the paper would be improved by consideration of the points below and its suitability for publication is dependent upon satisfactory responses to a number of these points.

Discretionary Revisions

1) Pg 2 Line 110: "inform the development of effective strategies for promoting physical activity". The guidelines referred to throughout this paper are MVPA guidelines specifically so MVPA rather than general physical activity should perhaps retain focus throughout the paper.

Minor Essential Revisions

1) Introduction Pg2 Ln 60-62: “According to national and international guidelines....” The author’s need to acknowledge that the guidelines at the time this research was conducted have since been adapted and current guidelines now state ‘150 minutes/week’.

2) Pg 2 Line 83: The distinction between self-reported physical activity as assessed using a questionnaire and awareness of physical activity i.e. whether an individual perceives their activity to be sufficient or not should be discussed as it could be misinterpreted that misperception is the same as over/underreporting. The difference between the two should be explicitly highlighted.

3) Pg 2 Line 84: This sentence needs restructuring. Currently with the way it reads you almost ask why improve awareness when overestimators have better health outcomes....

4) Pg2 Line 104: “we assessed awareness of physical in a...” need to add activity.

5) Pg2 Line 108: “A deeper understanding of the factors.... important for understanding”. Understanding is important for understanding... Change this sentence.

6) Methods Pg 3 Line 133: “did not provided at least...” should read did not
provide at least

7) Pg 5 Line 220: “misperceived their physical activity by incorrectly reporting that they were not meeting the guidelines”. This needs to be phrased differently as it may be confusing due to the fact that self-reported physical activity was also measured. ‘Reporting’ should perhaps be avoided, or it should be explicitly stated at the beginning that when ‘reporting’ is referred to this means the awareness item not the self-report.

8) Pg 5 Line 233: “more future-oriented”. Reword as ‘more oriented towards making goals for the future’.

9) Pg 6 Line 285: “their overweight status”… This needs to be explained further. Was this group more overweight? I am not clear why this group is at a greater risk and need our attention as in this case they were healthier and were more active than accurate inactives.

Major Compulsory Revisions

1) General comment: The author’s need to explicitly differentiate between self-report and awareness. The difference between misperception and inaccurately self-reporting physical activity needs to be explicitly discussed to ensure confusion is avoided. The author’s also need to be more careful throughout in the terms they use when referring to misperception and should steer clear from the word ‘reporting’ when discussing misperception as this could be confused as inaccurate reporting. If self-reported physical activity was not actually used (see specific comment 9) then deleting it altogether will help prevent confusion.

2) General comment: The practical application of your findings should be better explored in the discussion. Physical activity guidelines are population-wide and so what does this mean for population attempts to change behaviour?

3) Methods Pg 3 Line 146: For those who did not provide a full week of accelerometer data it is not clear how the determination of whether they met guidelines was made. This needs to be explained. Also, you need to give your criteria for a valid day and week

   Was PAL calculated using only one 24hr period? If so you need to explain what 24 hr period was selected and why only 24 hr was used?

4) Pg 3 Line 151: Having individual’s complete a self-reported physical activity questionnaire could have informed their awareness regarding their physical activity level as they will have listed their activities and be more conscious of their behaviour than they would be generally. This should be listed as a limitation.

   You don’t seem to use the self-report data so why was it collected? If it was not used do not report it.

5) Pg 3-4 Line 158 onwards: Section needs re-writing as it does not read well and is confusing in its current state. On line 159 the question for the concern
construct is needed as the response options make no sense in the context of the sentence. This whole section will read much better if each construct is described in the same manner and the same information given for all. For all constructs; list the construct e.g. concern, give an example item (add this), state the number of response items e.g. 4-point scale and give the response scale e.g. not at all to very.

6) Pg 4 Line 178-179: “equivalent to 30 minutes of moderate to vigorous physical activity per day.” You state that individuals were classed as meeting guidelines if they had a PAL which is equivalent to 30 mins/day. Physical activity guidelines were 30 mins on 5 days per week so in actual fact your participants had to achieve more than guidelines in order to be labelled as meeting guidelines. If this is the case then it is a massive limitation as your paper can’t claim to more accurately match awareness of physical activity and actual physical activity as the items are not equivalent (i.e. your objective assessment of meeting guidelines is based on 30 mins/day whereas the awareness measure is based on 30 mins 5 times per week).

7) Pg 5 Line 269: Within the ‘inactive bunch’ overestimation appears to be a good thing… In addition, the finding that overestimators are more active could explain the lower intention. Was current physical activity level controlled for in the analyses?

Pg 6 Line 288: Again, could this not just be because they were more active and so had less need to increase physical activity?

8) Pg 6 Line 306-307: As you state in your introduction misperceptions can be because people do not judge their own activity well or because they do not know how much they should do. I do not think this reference to pedometers adds to this paper as pedometers themselves are unlikely to improve awareness unless individuals know how many steps they should be doing. In addition this paper is concerned with the guideline of mins/day not necessarily steps. Find a better example of a strategy that could be used to apply your findings in place of this pedometer reference.

Level of interest: An article of importance in its field

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