Reviewer's report

Title: Mobility and cognition are associated with wellbeing and health related quality of life among older adults

Version: 2
Date: 19 December 2014

Reviewer: Rachel Ward

Reviewer's report:

I think that this could be an important manuscript that significantly contributes to the field. Although, I have one major concern. The authors have previously published on very similar associations and do not explicitly state what additional novel contributions the submitted manuscript will make to the field.

Major Compulsory Revisions

1. The author group’s work cited in reference 32 appears to be similar to the analysis in the submitted manuscript. Please describe how this work is different and what new contributions this work makes to the field.

Minor Essential Revisions

2. There are a few typos within the manuscript that should be corrected.

3. What is meant by “preference-based outcome measure”?

4. The first sentence of the last paragraph of the background is overstated. Little support is given on why cognition and mobility are two of the most pressing health care issues of the 21st century. Although, this sentence could be supported by citing the rapid aging of the population. Also, the aim of this paper is to show that these factors are associated with HRQoL and wellbeing, so to say that they critically impact these outcomes in the background is not sufficiently supported yet.

5. Line 164 lists the TUG but does not describe it. Was it included as a measure?

6. It is clearly described why the MOCA was included in the analysis over the MMSE, but why wasn’t the DSST chosen for the regression analysis?

7. What comorbidities are included in the FCI?

8. When testing assumptions, was linearity of the relationships between the dependent and independent variables assessed?

9. The analysis yielding the results in Table 2 is not described in the Statistical Analysis section of the Methods. Wasn’t this the secondary aim?

10. Line 216 says that the cohort of senior women had mean scores of... Didn’t this cohort include men too?
11. Line 233 should list the known covariates that were adjusted for in the models.

12. The sentence in line 259 is difficult to follow and overstates the findings. It says that the constructs of the ICECAP-O may be more sensitive to changes in cognitive function but this analysis is cross-sectional and thereby did not include change.

13. I’m having trouble connecting the ideas presented in the second paragraph of the discussion. Perhaps it should be more carefully described. Particularly the last sentence. Is the point that the ICECAP-O is able to tap into individuals’ functionings or should this be capabilities? I thought the point was that the ICECAP-O measures capability whereas the EQ-5D does not.

14. Can you speculate as to why measures of executive function would be associated with wellbeing but not HRQoL?

15. The strengths and limitations should be described in more detail. For example, participants were referred by health care providers to the study based on perceived fall risk. On one hand, this is a very specific population and results may not be generalizable to others. On the other hand, this is an at-risk population for which findings are highly relevant.

16. The conclusions in the last paragraph of the discussion are overstated. The study does not really confirm that mobility and cognitive function play a critical role in HRQoL and wellbeing because this analysis was cross-sectional and findings have not been repeated. The study does suggest that such a role exists, however. Also, the ICECAP-O may tap into important aspects of cognition.

17. Please define the abbreviations in a label/footer for each table.

Discretionary Revisions

18. I think the aim can be more accurately described in the abstract and background. It states that the primary objective is “to identify key factors related to mobility and cognitive function that explain variation in wellbeing and HRQoL.” I think factors is the wrong word here; it’s not specific enough. Maybe “measures of mobility and cognitive function” would be a more accurate description. Or maybe the aim is really to assess the amount of variation in wellbeing and HRQoL that is explained by mobility and cognitive function.

19. I’m not clear on what is meant by the first sentence of the Background. Is assessing quality of life a common activity within public health or is it more appropriate to say that it should be? Does it really get the attention that it deserves? This article suggests that perhaps it does not. Maybe it’s more accurate to say that ascertaining quality of life should be a priority of public health and clinical research.

20. It seems that risk of falls or falls self-efficacy could mediate the relationship between mobility or cognition and HRQoL or wellbeing. This seems like a prime
population in which to investigate this. Was this explored?

21. The second paragraph of the discussion argues that the mobility domain within the EQ-5D is not the only reason the two measures were associated. Maybe it should be mentioned that other EQ-5D domains besides mobility were also associated with the SPPB (Table 2).

22. The order of the future directions would make more sense if they were reversed, listed according to what should be investigated next.

23. Can you make a third column for the R-squared values in Table 3?

24. Could the additional variances accounted for by the SPPB and the MOCA be included in Table 3?

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**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.