Reviewer's report

Title: Education-related differences in physical performance after age 60: a cross-sectional study assessing variation by age, gender and occupation

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Reviewer: Bjørn Heine Strand

Reviewer's report:

Thank you for this revised edition of the paper. The paper has improved, but I still have some concerns.

Major Compulsory Revisions

I still do not understand why the authors do not adjust for age in tables 1 and 2. Stratified by the broader age groups is fine, but for example results like better performance among smokers is not very informative as I believe the mean age is higher among never smokers. Thus, the first paragraph of the results (page 11-12) is quite un-informative as it is not based on age-adjusted results. Furthermore, the authors give us adjusted results in fig 1 and 2, but here all mediators and confounders are included so it is hard to follow which mediators and confounders are more important explaining the educational gradient. Another weakness with the paper is that the authors base their conclusions on two sets of analyses – one based on a regression model of the full sample adjusted by possible confounders, without any interaction terms (except in additional analyses where interaction was being investigated). This first set of analyses are not presented in tables, it is just mentioned in the text. Secondly, the authors present a set of stratified analyses (figs 1 and 2), which suffer from low statistical power in some sub groups. Due to this lack of power some associations do not reach statistical significance and it is concluded no association.

On page 13 line line 3 the authors claim that there was no educational gradient in grip among men, only women. A p-value for this interaction would be nice to back up this claim.

On page 13, line 4-6 it is stated that there was differences in balance, chair stands, and walking speed (p<0.05) for both men and women. For me it seems from fig 1 that there was no educational gradient in balance in men, and not in women for chair stands. It would be helpful to give overall p-values for each of the 16 combinations in fig 1, so the reader did not have to guess on the overall association. Same applies to fig 2.

As noted by reviewer 1 and myself, the authors rely too much on the p-values without taking into account that they are comparing associations in sub groups of unequal sizes. For example in figure 2 the number of female manual workers is n=564 while female non-manual workers are almost three times as big (n=1484). Thus, the association could be significant in the larger sample just due to larger
sample. I suspect this might be the case for walking speed, where the gradient across educational groups seems even stronger in female manual workers than among female non-manual workers. Still, the authors claim that there is only an educational gradient among the non-manual women (page 13, line 8 from bottom). I stressed the use of interactions in my last review and here a test for interaction would be helpful. Interactions are provided at the bottom of the paragraph, but they are not linked with the results above and hard for the reader to grasp. Please also give the exact p-values and not mere state that it is borderline significant.

In the discussion it is stated that all 4 measures showed larger educational gradient among the older age group (80+), but in the results no significant interaction of education by age group was found for chair stands. As stated above, I am also very curious to see the actual p-values for the interactions education by age group for the other 3 measures.

In the discussion, the problem of p-value focus in small sub set analyses is again problematic. It is concluded on page 15 last para: “For men in the present study, the education-related differences in balance and chair stands were attenuated by occupational class.” I believe this statement is based on the results in fig 2. Regarding chair stands for men there seems to be an equal association with educational level both among manual workers and non-manual workers. However I would believe the significance level is neither found in either of the occupational groups as the stratified analysis has only n=204 manual workers, and n=960 non-manual workers.

In the next line it is stated that “For women, we found statistically significant education-related differences in all dimensions of physical performance even when adjusting for occupational class.” Is this statement based on fig 2? Or did the authors perform some adjusted analyses, which are not presented in tables? If based on fig 2 I cannot see that there can be a significant educational gradient for all the physical performance measures. For example the educational gradient for chair stands seems quite flat for both manual and non-manual workers in women. Likewise for manual workers for balance. When reading the manuscript further, I see these results are commented upon. I find it confusing to present both the adjusted analyses and the stratified analyses, as they tend to give diverging conclusions.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.