Reviewer’s report

Title: Association of physical activity with lung function in lung-healthy German adults: Results from the KORA FF4 study

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Reviewer: Fernando César Wehrmeister

Reviewer's report:

The manuscript "Association of physical activity with lung function in lung-healthy German adults: results from the KORA FF4 study" presents an important research question. Physical activity has been related to good health and only few studies investigated the association between PA and lung function. Also, authors used an objective measure of PA, using accelerometers. The paper is well written and easy to follow with appropriate statistical analysis.

Main concerns:

* It seems the sample size was not calculated to the objectives of this study. The study has a relative small sample size (<10%) since the original recruited sample comprised more than 4,000 individuals. In the present manuscript around 340 individuals were evaluated. No comments on how the subsample for the "PA and lung function study" was selected (randomly? systematically?). Authors did not mention any implication of this in the results. The representativeness of the sample seems to be very compromised.

* Even if the authors mentioned interaction terms on the analysis, they did not appear to evaluate properly if it is necessary to stratify or not the results. Again, the sample size will be a problem due to stratification for a lot of categories, especially with smoking status and PA as quartiles.

Minor concerns:

* One suggestion could be show all the results stratified by smoking status. To show the Table 1 by sex, Table 2 by smoking status and Table 3 for all sample is a little bit strange.

* It would be nice to see a comparison regarding some characteristics of the original sample with the sample included in this paper.

* Authors did not mention any evaluation of quality of spirometry. They followed ATS e ERS statements. It would be nice to see some information regarding the quality of spirometries.
* Maybe the authors could do a mediation analysis, using g-formula. It will provide the natural direct and indirect effects of smoking status on the association of PA and lung function.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Unable to assess

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

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