Reviewer's report

Title: Physical activity and sleep profiles in Finnish men and women

Version: 1 Date: 1 October 2013

Reviewer: Jessica McNeil

Reviewer's report:

This paper does address an essential question, which is how leisure, occupational and commuting physical activity may be related to sleep patterns and different chronotypes. The sample size is also very large, which allows for good generalizability of the results. Please find some comments below that need to be addressed before a decision on accepting this manuscript for publication can be made.

Major Compulsory Revisions

1-The assessment of chronotype is questionable because it is not specified whether the chronotype is based on the subjects’ willingness to go to bed at a certain time, or on the fact that they have to go to bed at a certain time due to work, social activities, etc. If certain subjects are forced to go to bed at a certain time, then this is not their true chronotype. Please address.

2-Discussion, paragraph 4: The authors discuss the link between different sleep patterns with age. Was age assessed? If so, it is suggested that age also be added to the model, or as a mediator in the model.

3-Was shift work taken into consideration? The authors discuss the potential differences in sleep patterns between working days and days off, and these may be quite different in those who work shifts, as briefly discussed by the authors in the last paragraph of the discussion. This would be a relevant "employment status" category to add, if the authors have this information.

Minor Essential Revisions

4-Grammar and spelling revisions are needed in some parts of the text. Please revise.

Abstract:

5-Please specify what you mean by different types of physical activity and sleep.

6-In the methods section, the final sentence is quite vague and does not say very much. I would recommend explaining in more detail or rewording.

7-What is considered "sufficient sleep"? Please define. What is considered sufficient sleep for one, may be insufficient for another. I would suggest using another term, such as "recommended sleep".

8-The authors mention that "high levels of occupational physical activity is associated with shorter and worse sleep", however there is no mention of this in the results. The results suggest that physical inactivity is linked with short sleep
and evening type. Please address this discrepancy.

9-I would suggest using the term "poor sleep" rather than "worst sleep".

Introduction:

10-1st paragraph: Please add a direction to the link between sleep duration and sleep quality with CVD risk.

11-Please define "good sleep" in terms of duration and quality.

12-5th paragraph: Please define "eveningness" and morningness".

13-Please define the term "re-entrainment of circadian rhythm". Also, please explain in what way the circadian rhythm can be altered by physical activity.

14-6th paragraph: Is it that a long time spent in bed predicts decreases in physical performance and immobility incidence or vice versa? It would seem that some individuals may be more predisposed to spending more time in bed because of physical immobility or other physical problems, and not that the long time spend in bed necessarily causes this. Please address.

15-7th paragraph: Please add hypotheses that were tested.

Methods:

16-Paragraph 5: Is the defined chronotype based on the subjects' willingness to go to bed at a certain time, or is it based on the fact that they have to go to bed at a certain time due to work, social activities, etc. This would be important to specify.

Results:

17-Paragraph 2: Please clarify the difference between the "evening-type" and "more evening-type". The authors mention that the "evening-type" report a likelihood for increased morning tiredness, while the "more evening-type" report a poor morning alertness. It is difficult to understand the difference between the 2 sub-groups, based on these explanations alone. Additionally, please use another term to describe the "more evening types" and "more morning types". These terms may lead to confusion.

18-Paragraph 2: The midpoint of sleep is a measure of sleep timing and not sleep chronotype. This may be different in the case where someone is forced to go to bed earlier or later because of work, social demands, etc. Please address.

Discussion:

19-Paragraph 1: Do the authors mean "poor sleep quality" when saying "not sleeping enough"? They mention "not sleeping enough" and "short sleep" as different profiles, but these are the same. Please address.

Discretionary Revisions

Abstract:

20-The 2nd sentence is quite long. Please restructure the sentence.

21-Please replace "of variety of" by "between".

22-Please replace "for" this study by "in" this study.
23-In results, add leisure time physical activity "and" sufficient sleep.

Introduction:

24-2nd paragraph: Please remove the term "physical fitness", as the relationships that you are describing in the next line are based on physical activity participation and not fitness level.

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

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

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests