Reviewer’s report

Title: Investigating the associations between productive housework activities, sleep hours and self-reported health among elderly men and women in western industrialised countries

Version: 0 Date: 10 Nov 2017

Reviewer: Robert Meadows

Reviewer’s report:

This is an interesting study. The authors use MTUS to look at the association between time spent on housework, time spent on sleep and health. More uniquely, they look at the interactions - concluding that women have higher odds of reporting poor health when more time is devoted to total housework combined with short or long sleep duration.

My main suggestion relates to the data and analysis. I do think these need to be somewhat more nuanced.

Methods - data section

1) We need to know more about the method of delivering the diary. It is not immediately clear to the reader whether the data is for one 24 hour period per person; same day of the week; whether individuals were allowed to code primary and secondary activities;

2) Nothing is said about response rate, representativeness, weights etc

Method - statistical analysis

1) it appears that simple binary logistic regression was used, but the data would seem to be appropriate for some form of multilevel model.

2) Doing analysis separately for men and women is also quite simplistic. See paper by Mood 'Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It

Limitations

Some further reflection is needed on the challenges of using time use methods to capture sleep. The statements on page 16 are talking about sleep, housework, health at the same time - so it is not clear what is being referred to in the point about time use being more accurate than survey data.
Whilst the author(s) do a good job of avoiding statements of causation - there is a need to be constantly vigilant throughout that this is, at most, a statement of association and the direction of travel remains unknown

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

No

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

Yes

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

No

**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

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Acceptable

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