Reviewer's report

Title: The fractionalization of physical activity throughout the week is associated with the cardiometabolic health of children and youth

Version: 1 Date: 23 January 2013

Reviewer: Edith van den Hooven

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Janssen et al. performed a study on the impact of physical activity on cardiometabolic risk factors in children and youth, focusing specifically on the effects of the fractionalization of weekly physical activity. Children were divided into three groups: frequently active, infrequently active, and physically inactive. The authors observed that physically inactive children had the least favorable cardiometabolic risk factor profile, and that frequently active children had the most favorable cardiometabolic risk factor profile. The differences appeared to be attributable to weekly frequency rather than weekly volume of physical activity.

This is an interesting paper that is clearly written and presented, which adds to the literature focusing on health effects of physical activity in the younger population. I have some comments for Minor Essential and Discretionary revisions.

Abstract

1. In the Results part, instead of mentioning non-significant differences between the frequently active and the infrequently active group, I would suggest to describe the significant differences in the specific outcomes.

Methods

2. Line 87-89. What are the differences in characteristics between subjects with and without available information on physical activity and cardiometabolic risk factors? This should be described in more detail and also applies to line 306-308 in the Discussion.

3. Line 144-146. Extrapolating the findings of only 4 days of wear time may introduce misclassification of exposure. Did the authors perform a sensitivity analyses in which the children with only 4 or 5 valid days (8.2% + 17.2%) were excluded, to see whether this influences the results?

4. Line 198 and further. Since information on body mass index is available, I would highly recommend to show a third model, additionally adjusting for BMI, as the associations between physical activity and cardiometabolic risk factors may be largely driven by BMI.

5. It would be interesting to see the results of Table 2 when the total active group (frequently active + infrequently active) are compared to the physically inactive group. Perhaps these results can be presented in a Supplementary Table.
Discussion

6. Information on physical activity was available from accelerometers. Is there any information on the types of physical activity that the children performed (e.g., endurance, strength, or flexibility training)?

Table

7. In Table 1, the 95% range instead of the 95% CI is given. Please report the minimum and maximum values as well, to give the readers an idea of the variation in the sample (which may be very small for variables such as HDL and triglycerides).

8. In the text, it is stated that age and sex were not included as covariates (line 181), whereas the legend of Table 2 states otherwise. Please clarify.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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