Reviewer's report

Title: Longitudinal levels and bouts of sedentary time among adolescent girls

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Reviewer: Andreas Nilsson

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The manuscript describes levels and bouts of sedentary time among a large group of adolescent girls when measured at two time points (follow-up after 1.5 years). The aim is clearly stated and the manuscript is overall well written. The method chosen; accelerometer, is considered the standard for objective measurement of sedentary time and particularly appropriate in young age groups. Data variables are reported in accordance to previous studies. However, the authors may like to comment on some concerns regarding theoretical background presented, data handling, and discussion of results.

Major Compulsory Revisions

Overall comment

Originality and novelty of a large part of the data presented can be questioned. As stated in the introduction, cross-sectional data on levels and patterns based on large samples has been published before. Furthermore, that volumes of sedentary time increases by age is expected, not only due to cross-sectional observations from studies cited in the manuscript, but also as previous longitudinal studies have confirmed previous cross-sectional observations (Treuth et al., A longitudinal study of sedentary behavior and overweight in adolescent girls. Obesity, 2009, 17:1003-8; Ortega et al., Objectively Measured Physical Activity and Sedentary Time during Childhood, Adolescence and Young Adulthood: A Cohort Study. PLoS ONE, 2013, 8: e60871).

Introduction part

In the introduction part, the authors may like to acknowledge the current body of evidence regarding the influence of sedentary behavior on different markers for health in youth as inconclusive. The absolute majority of studies based on objectively measured sedentary time have failed to show independent relationship between sedentary time and health parameters among adolescent girls, including work published by authors to the current manuscript. For example, work by (Carson et al., BMC Public Health, 2011,11:274; Colley et al., BMC Public Health, 2013, 13:200; Ekelund et al., JAMA, 2012,307:704-12) may be appropriate to include in order to provide a theoretical background more in balance with the current body of knowledge within this field.

Method part

At least 10 hours of wear time per day was used to include the measurement in analysis. This is appropriate when analyzing whole day registrations. However,
when analyzing segments of the day (school time, after school, evening) a registration fulfilling the 10 hour limit may still have substantial loss of wear time during specific parts of the day. For example, a participant may wear the monitor from noon time until 10 p.m because he or she forgot to wear it in the morning. As data is reported as percentage of wear time a potential large loss of wear time during specific time periods may influence the results. How was this potential problem treated?

Discussion part
When compared to previous studies the result on volume of sedentary time is simply stated to more or less correspond to what has earlier been presented. Whether the observed levels of sedentary time reported in fact show that the participants can be classified as sedentary is left out in the discussion. This is of interest to include as the authors like to target the participants as a group for interventions aiming to reduce sedentary time. A part discussing this should be included.

A significant difference in level of sedentary time between days was evident at baseline but not at follow-up. Given the very small difference between days at baseline (63.2% vs. 62.5%) and almost identical result at follow-up, it seems unbalanced to discuss these results as in accordance with previous studies, showing that type of day influence sedentary behavior. What perhaps could be discussed is whether the difference observed at baseline should be view only as of statistical relevance due to large sample size rather than a difference of any true clinical implication. If the difference is regarded as the latter, why this influence of days disappears during the 18 month follow-up period could be of interest to discuss. As of now, the conclusion that type of day has an influence seems unjustified by presented data.

Minor comments
Table 1. Standard deviation for baseline weekdays is 1.0, while all others are 0.1. Is this correct?
Table 3. It is confusing that bouts/hr is not significant while bouts/day is. Logically it would mean that the difference in bouts/day simply reflects differences in wear time between days.

Discretionary comments
The authors show that the relative amount of sedentary time differs during time periods of the day, where the evening time holds more sedentary time compared to the others. Based on this observation they conclude that evening time is an appropriate time period to focus on when it comes to reducing sedentary time. However, the fact that this period holds a higher relative amount of sedentary time does not automatically imply that this is the time period best suited for intervention efforts. Can it be that evening time has more sedentary time simply because it reflects a normal living behavior, where the girls are indoors before bed time, compared to school or after school periods? Even a highly active individual, with little time spent sedentary, is likely to have more time spent
sedentary in the evening time compared to day time. The authors’ suggestion of pointing out specific time periods for interventions should be based on more than simply the period with the highest amount of sedentary time.

**Level of interest:** An article of limited interest

**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