Reviewer's report

Title: School day segmented physical activity patterns of high and low active children

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Reviewer: John Sirard

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Review for BMC Public Health
School day segmented physical activity patterns of high and low active children

Major Compulsory Revisions

The purpose of the study was a little unclear to me. Perhaps the use of the word “confounding” is what is throwing me off. To me, a confounder is a variable that you don’t really care about and are just trying to control for its effect on both the dependent and independent variables. They are not typically included in the results tables (rather just a footnote saying they were controlled for). In the current study, the child- and school-level variables are actually a large focus of the study – trying to understand if these factors are associated with PA at different times of the day. So, rather than confounders, these strike me more as correlates. The text throughout would need to be revised to reflect this difference.

It would be more informative to structure the tables and results so that the contribution of each level of explanatory variables (correlates) could be viewed. For example, we already know that physical activity group (HIGH vs. LOW) will explain the greatest amount of variance in MPA and VPA – by the design of the study. So, the Group variable should be entered into the model first and the variance explained reported. Then, enter in the demographic / anthropometric variables and provide the variance explained. Then, enter the school-level variables. Then provide the overall model statistics. That information seems to be in the tables (at the bottom) but could be moved up to separate the sections (levels) and the “Child level variance” separated into Group and Demographic/Anthropometric.

Abstract, Background: change “influence” to “association with” to better reflect the cross-sectional nature of most of this research.

Abstract, Results, sentence 2: Replace “influenced by” with “associated with” – cross-sectional data

Data analysis, paragraph 1: The inclusion criteria indicate that kids were included in the analysis if they had 3-5 days of acceptable accelerometer data. If a student had 5 days of data and he met the recommendation on 3 of those 5 days, he would be put in the HIGH group (3/5, 60% of school days met the recommendation). However, what if there was a student that only had 3 days of
data but met the recommendation on 2 of those 3 days (2/3, 67% of school days met the recommendation). In your scheme, the individual with only 3 days of data would need to have all of those days above the recommendation – unfairly penalizing these students. So, it would seem more appropriate to base the Group categories based on the percent of days they met the recommendation rather than an absolute number. If they had 4 days, would the HIGH group be those with 50% or 75% of days meeting the recommendation?

Results, Table 3 and 4 and related text: the coefficients for enrollment. For every additional enrolled student we would expect up to 0.03 fewer minutes of MPA (or VPA) – that’s about a 2 second difference. So, there would need to be an increase of 30 students to decrease PA by 1 minute. Statistically significant but not likely very meaningful at the biological level and probably not relevant to policy makers deciding on school enrollments and catchment areas (redistricting).

Results, Table 4 and Table 6 and related text: The coefficient for playground size is too small to be biologically meaningful. The interpretation here would be that for each square meter increase in playground size, there would be an additional 0.001 minute of VPA. So, to increase VPA by 1 minute before school, you would need to increase the playground size by 1000 square meters. Since the average playground size is only about 2,000 square meters, you would need to increase the size by 50%. Probably not an important modifiable factor at the policy level, especially in urban areas where there is limited room for expansion.

Discussion, After-school, paragraph 2: here the authors indicate that the playground size effect, while stat. sig., is likely not meaningful. But, that needs to happen for the other effects that are similarly very small – not just for this one that is in the “unexpected” direction.

Minor Essential Revisions
Abstract, Results, sentence 1: Indicate that these differences are independent of child- and school-level factors

Background, paragraph 2, 2nd to last sentence: The two studies mentioned here (9, 13) should be explained in a bit more detail and explain how the current study is unique and builds onto these two studies – more specifics needed.

Background, purpose statement 2: Not clear what differences are being investigated. Since they are already being dichotomized into HIGH and LOW, the HIGH group will be more active. So, would it be more accurate to say, “…investigate the magnitude of the differences in MPA and VPA between… segments of school week days.” Rather than the “confounders” statement, there could be a third purpose statement about investigating the associations between child- and school-level correlates with MPA and VPA of HIGH and LOW active children during different segments of the day.

Data Reduction, sentence 2: Why was 20-minutes chosen as the non-wear period criterion? Please provide a supporting reference.
Data Reduction, middle of paragraph: VPA has already been defined previously, no need to do so again.

Data analysis, Sentence 2: “Prior to application of Actigraph inclusion criteria…” It’s not clear to me what this means. The authors should have removed the non-wear time and set to missing days with less than 600 min/d prior to calculating minutes of MVPA per day.

Data analysis, paragraph 2: language needs to be revised to reflect the cross-sectional data (replace “effects of the” with ‘associations with the” – or something similar). Also, do the MPA models control for VPA? Do the VPA models control for MPA?

Results, Table 1 and related text: Reformatting this large table with sub-headings based on the level of the data would help readability. Since these are youth, replace BMI with BMI percentile or BMI z-score. Also, move the % normal, OW and OB rows up with the other anthropometric data. These % values look rather different to “the eye” but not clear if there was a chi-square test done. Evening time period not mentioned previously and can be removed from the table.

Results, Table 2 and related text: We would expect there to be a fairly similar distribution of HIGH and LOW active kids across schools. Therefore, it seems unnecessary to split this table into HIGH and LOW – all variables can be averaged across all schools.

Results, Table 3 and related text: need to have BMI % (or z-score) in all of these tables (3-6).

Conclusions: revise the second sentence to reflect “correlates” not “confounders”.

Discretionary Revisions

Background, last sentence: The mention of interventions here seems out of place since the study does not test an intervention. Rather, the authors could mention the need to identify child and school-level factors that contribute to or inhibit children’s accumulation of MPA and VPA to design more effective interventions.

Procedures, Paragraph 2: The IMD is a measure of neighborhood-level SES, not individual family-level. Is there any evidence on the association between IMD score and family-level SES?

Data Reduction: “Recess… which tend to have some form of floor markings…” Could the amount of markings actually be added to the analyses based on the Google Earth image data? This may have more influence on PA than just the size of the playground.

Level of interest: An article whose findings are important to those with closely related research interests
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.