Author's response to reviews

Title: A cross-sectional examination of the association between school policies and the built environment surrounding a school on overweight and obesity among grade 1 to 4 students

Authors:

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Author's response to reviews: see over
Dear Editor,

I am pleased to resubmit “A cross-sectional examination of the association between school policies and the built environment surrounding a school on overweight and obesity among grade 1 to 4 students” for publication in BMC Public Health. The following revisions have been made to this manuscript.

Reviewer 1
Comment 1
The research explores variation in children’s overweight and obesity between schools and investigates potential explanatory variables from the built environment within the school setting and surrounding area. This paper is well written and provides an interesting and valuable contribution to current literature.
Response
Thank you.

Comment 2
As the author acknowledges, having no individual energy intake data or data relating to food options within the school setting is a limitation of this particular study, however some additional details regarding the role of physical activity in explaining the variation in overweight seen between children from different schools would be of value here.
Response
This has been added to the revised manuscript.

Discretionary revisions:
Comment 3
In this paper obesity is not found to vary between schools, however it is possible that the non-significant p-value may be due to the relatively small numbers in this group. As both overweight and obese children represent 25% of the total sample perhaps it would be better to combine these two groups in analysis? Does this have any impact upon the results?
Response
This is an additional analysis that I had also performed when I was originally doing the statistics for this manuscript. The third model, where overweight and obese students were grouped together, identified that there was not significant between-school random variation in the odds of a student being overweight/obese \([\sigma^2_{\mu_0}=0.115(0.0.89), p>0.1]\). Given that this was the case, I did not believe that it made sense to include this model in the manuscript as it did not add value to the two models already presented. That being said, in the revised manuscript, I have added a statement stating that this was explored and it was not significant, so that readers are aware this model was performed but why it is not presented.

Minor revisions:
Comment 4
Please include participant age ranges in years (not just school grades) either in the abstract or methods section.
Response
The age range of the respondents has been included in the revised manuscript.

Comment 5
Throughout the document it is stated that height and weight were objectively measured however very little detail is provided regarding measurement protocol in the methods section. As this is the main outcome variable for the study greater detail would be useful e.g.: were shoes and outdoor clothing worn/removed consistently; the make & model of measurement tools; whether the same researcher collected data between schools etc.
Response
We have added this additional information to the revised manuscript.

Comment 6
The final sentence in the first paragraph on page 12 should read ‘he/she was less likely to be overweight’
Response
This has been corrected in the revised manuscript.

Comment 7
This paper recommends targeting schools with limited access to recreation facilities during the school day presumably with the aim of increasing school-time physical activity. However, there are now a number of publications that explore associations between objectively measured school-time physical activity and playground equipment/facilities, not all of which report significant associations or intervention effects (e.g. Cardon 2009 Prev Med (48) 335-340). This research should be acknowledged in the discussion.
Response
This has been corrected in the revised manuscript. We have now added this research to the discussion highlighting that providing facilities is not necessarily sufficient, but that it also requires additional factors such as teacher encouragement and supervision.

Comment 8
School level differences were found to account for 7.7% of the variability in the odds of a student being overweight, was this before or after adjustment for physical activity? It would be interesting to know how much of the variance in overweight between schools is accounted for by differences in children’s physical activity.
Response
Considering the value of 7.7% represents the between-school variability, and student physical activity is measured at the student-level, it would not add value to the manuscript to describe how much of the school-level variability is explained by one student-level characteristics. In fact, when controlling for student-level physical activity, the school-level variability in overweight actually increases slightly (which makes sense given that you are controlling for an important student characteristic when examining differences across schools). As such, it might be misleading to readers to present such information without providing the necessary and detailed description of what the result would actually mean.
Comment 9
Similarly it would be useful to know how much of the between school variance in overweight is explained by the two significant explanatory variables (access to recreation facilities and support for active transport).
Response
Given that these are school-level characteristics, it does add value to the manuscript to present this value. As such, this information has been added to the revised manuscript.

Reviewer 2
Comment 1
Given that the aim of the paper, as stated in the abstract (though not explicitly in the paper itself) is ‘to examine if school-based physical activity policies and the built environment surrounding a school are associated with weight status among children’, I would like much more information on the how school policies were measured, and the types of environments that participating schools were set in.
Response
Additional details of how the HSP measured aspects of the PA policy environment within a school has been added to the revised manuscript.

Comment 2
Policy data were collected by the ‘Healthy School Planner (HSP)’, but the paper gives no information about what this covers. The only policies mentioned are the two found to be significantly associated with overweight. We need to know what other policies were included, but were not found to be associated. I would like to see a summary of the HSP methodology, and a table outlining the ‘HSP indicators’ at the participating schools. This table could also include the summary of the built environment measures, which is presently only included in the text.
Response
Additional details of how the HSP measured different aspects of the PA policy environment within a school have been added to the revised manuscript. We are unable to provide a table with the HSP descriptive statistics in this manuscript as those data have been previously published and this would infringe on the copyright. Please note, the school-level characteristics in the PLAY-On host study are the same for the subsequent papers examining different outcomes and age groups as the school-level characteristics do not vary at the student-level. As such, they were presented in the first PLAY-On manuscript written and simply cited in the remaining manuscripts as to not impinge on the original copyright. In the revised manuscript we now make it clear that those school-level data have been previously presented and we provide the appropriate citation. We also added some written descriptive statistics from the HSP to the text of the revised manuscript highlighting the key statistics.

Comment 3
In addition to the school characteristics, which are the main focus of the study, several measures of the child’s preference for PA are also included, and in fact, seem to dominate the results. Given that these measures are co-variates in your model, and not the main
focus of analysis, it might be helpful to reduce the number of individual measures included, or to use a composite measure for overall PA preference if possible.

Response

There are three reasons why I believe it is important to keep the child’s PA preferences in this manuscript. First, while a large focus of the manuscript was examining the school characteristics, we also highlight in the introduction that it is important to also examine student activity preferences. Very little is known in the literature about PA preferences for this age group, so this adds a valuable new contribution. Second, while a large purpose of this paper is to identify the important school-level characteristics, given that there was no between-school variability identified for the models examining obesity (hence school characteristics were examined in that model), highlighting that for obesity in this age group, the student characteristics were actually the important characteristics to examine. Third, I do not believe it would be informative to use an index of PA preferences as that reduces our ability to understand what specific preferences should be potentially modified through intervention. If this reviewer still feels strongly that we should remove these student-level correlates, this is something that could be re-addressed in another revision.

Comment 4

Introduction - The last sentence of the second paragraph (“Considering PA and sedentary behaviour appear to play important roles…” is confusing, and not really relevant.

Response

This has been deleted in the revised manuscript.

Comment 5

Introduction - Please state study aim(s) at the end of the introduction

Response

This has been added to the revised manuscript.

Comment 6

Methods - The ‘Procedure’ section reads like an overview of the methods, and is largely repeated elsewhere. This could be greatly shortened allowing additional words for expanded description of HSP.

Response

This concern has been addressed in the revised manuscript by providing a more adequate description of the HSP procedure.

Comment 7

Methods - The first sentence of the “Student-Level Measures – Parent Reports” section is a bit of an overstatement. Parental reports of children’s PA are not so reliable, and the reference you use actually looks at parental reports of time spent outdoors as a proxy measure of activity in pre-school children. Please revise or remove this sentence.

Response

This has been corrected in the revised manuscript.

Comment 8
Methods - The questions presented in the “Student-Level Measures – Student Reports” section would be clearer in bullet points
Response
This has not been addressed in the revised manuscript as bullet points are not consistent with the flow of the manuscript or the style of the journal.

Comment 9
Methods - In the “School-Level Built Environment Characteristics” section, please give an example of a ‘variety store’ – what types of foods do these sell?
Response
This has been clarified in the revised manuscript by also adding the term convenience store to the variety store indicator (as they are the same type of retailer).

Comment 10
Methods - Much more detail is needed in the data analysis section. What are the three steps in the modelling procedure? What co-variates were included?
Response
A description of the three-step modelling procedure has been included in the revised manuscript.

Comment 11
Discussion - The fourth paragraph of the discussion (built environment) seems to suggest that the authors did not expect to find an association between school neighbourhood measures and overweight/obesity, and begs the question why home neighbourhoods were not considered given they might be more important.
Response
Actually, when I performed this study we were expecting to find an association; it was rather surprising that we didn’t. Given that the host study was not designed or funded to examine the built environment around each students home (an expensive addition to a study design considering it would require 2331 separate data linkages - one for each participating student), we revised the wording in the discussion to state that future research should be designed to examine the built environment surrounding the respondents home.

Comment 12
Discussion - The fifth and sixth paragraphs are not really relevant to the stated aim of this study, and seems really to reiterate the authors previous findings.
Response
In the revised manuscript we deleted the fifth paragraph as we agreed with the reviewer. However, I believe that the 6th paragraph still adds value to the discussion of this work.

Comment 13
The limitations are a little confusing. Isn’t the aim of the HSP to identify school based programs and interventions in place at the schools?
Response
The HSP website purports that the HSP tool measures school-based programs, this is not in fact the case. It appears that it would have been clearer if I highlighted that in fact it only measures policies related to PA. As such, I have made revisions to the manuscript highlighting that the HSP measures PA related policies within the school environment.

Comment 14
Did you consider looking at interactions between school policies/built environment measures and grade? This might provide some insight into when to target policies, or how the impact children of different ages.
Response
In the revised manuscript we made it clear that we examined contextual interactions between the school policies/built environment characteristics and gender and grade. We also presented in the results section that for the model where this analysis was appropriate (i.e., overweight), there were no significant contextual interactions identified.

Please note that the University of Waterloo Office of Research Ethics approved this study. This manuscript (or corresponding data) have not been published elsewhere or are under consideration for publication elsewhere. I would like to thank you for considering this manuscript.

Sincerely,

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