Author's response to reviews

Title: Does school-based physical activity decrease overweight and obesity in children aged 6-9 years? A two-year longitudinal study in the Czech Republic

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Author's response to reviews: see over
Response to reviewer's report to manuscript “Does school-based physical activity decrease overweight and obesity in children aged 6-9 years? A two-year longitudinal study in the Czech Republic” (MS: 7474852947082031)

We thank the reviewers for their constructive comments that improved our manuscript substantially. We have amended the manuscript to the satisfaction of all the comments. All our responses (in cover letter) and amendments (in manuscript) are in red ink for easy identification of the changes.

Reviewer: Jaromír Šimonek
I recommend publishing the article without any major adjustments.

We thank the reviewer.

Reviewer: Nicola Diane Ridgers
The results of the study are likely to be of interest to researchers within this area.

We agree with and thank the reviewer.

Major compulsory revisions

1) The aim of the study, according to the title, is examining the effects of a physical activity intervention on overweight and obesity. However, the specific aims at the end of the introduction largely relate to physical activity levels of the children, and refer to an intervention which has not yet been introduced. The aims need to be clarified and addressed in the manuscript, and I would recommend stating the intervention along the lines of ‘a school-based intervention’.

We have now changed the formulation of the main aim of the study (page 6, lines 4-7, immediately under the heading ‘Aim of the study’) and across the manuscript. We have now also employed the term ‘a school-based two-year PA’. The clarification and addressing of the specific aims are further explained in point 2 below.

2) The introduction should introduce a rationale that justifies why targeting children during the early primary school years is a key time to intervene. In addition, specific aims are stated that relate to weekend and leisure time physical activity, yet no rationale was presented in relation to this. How could a school-based intervention affect out of hours activity? What previous research in this area has found this?

We have now inserted the literature relevant to the specific aims of the study. We have also amended the manuscript to highlight the rationale for the specific aims. This is now addressed in the background section of the manuscript (last paragraph on page 3 and continued on top of page 4).

3) In the methods it is mentioned that this study builds on previous work undertaken. Were the children in this study also examined in the previous work? If so, in what ways is this paper different to the previous paper?
This has now been amended. The continuity of previous and the current study as well as their differences have now been detailed (first paragraph on page 7, lines 5-10).

4) The introduction discussed how sex-specific interventions may be more effective in decreasing overweight and obesity. Was this a feature of the present intervention? If so, what was undertaken to ensure this occurred? In addition, the analyses may need to be conducted separately for boys and girls if this was the case. Could it also be clarified when the intervention finished?

Yes it was a feature. This has now been amended (last sentence on page 9). No measures were undertaken to ensure that this occurred; as children were also left to choose their activities and their groups (last sentence on page 9 continued on top of page 10). The PA intervention started on October 2006 and finished at the end of September 2008. This has now been amended in the title of Table 1 (page 32).

5) The analyses are comprehensive, and given the large number of outcome variables a range of statistical analyses have been conducted. It wasn’t clear, however, how the effect of the intervention is being examined in the ANOVA. In addition, could you clarify why the data were not adjusted for clustering both at the individual and school level?

This has now been amended. We have now rewritten the first sentences of the section ‘Statistical processing and data interpretation’ in order to clarify the examined effect on the amount of steps and AEE (page 13, lines 4-15). Data have now been adjusted separately for school and leisure time to uncover the effect of intervention PA programme directly at school environments and out of school (in leisure time of participating children). Data were adjusted only for clustering at school level due to the same design of PA intervention programme and also due to the similar PA-conducive environments at the selected intervention schools.

6) The results are interesting and comprehensively reported. However, no interaction effects appear to have been reported. Were no interaction effects found? In addition, it would be useful to know the proportions of children meeting the physical activity recommendations across the study. This could provide further evidence for the decreases observed.

We have now rewritten the part of the results ‘During PA intervention (October 2006 – June 2008)’ (page 14, lines 17-26 continued on whole page 15 and 7 lines on page 16) to precisely detail the ANOVA results, including any interaction effects. Yes, we found interaction effects at schooldays (page 14, lines 25-26 continued on page 15, lines 1-2), and at leisure time of schooldays (page 15, lines 20-22). We have now also inserted the proportion (%) of children from intervention and control group, who met the PA recommendations during the PA intervention (page 15, lines 3-12).

7) The discussion identifies and discusses the key findings from the study. However, the practical implications of these findings for further research and practice should be identified and discussed.

We have identified and discussed the practical implications for further research (page 22, second paragraph, lines 8-21), and inserted another limitation of the study (top of the page 22, lines 1-4). We have also added a few sentences about the contribution of school breaks to the
all-day PA of overweight and non-overweight children and the frequency of breaks periods (page 20, lines 9-11).

**Minor essential revisions**

Abstract: If there is space, please briefly identify the statistically analyses used in the study.

We have now added this information (page 2, lines 13-16).

Page 4, 2nd paragraph: The role of diet should also be acknowledged.

We have now acknowledged the role of diet (page 4, last paragraph, lines 21-23 - first of the mentioned features).

Page 4, 3rd paragraph: The sentence beginning ‘Indeed, longitudinal, studies...’ may need to be revised, given that this is an intervention study with multiple follow-up assessments.

We believe that this sentence is appropriate – the PA intervention lasted from October 2006 to September 2008. We repeatedly monitored the PA levels across the course of intervention.

Page 6: Some more information about the ‘Healthy Schools’ program would be useful. For example, how/why was it developed, what does it involve, was this part of the intervention delivered etc?

This has now been amended (page 7, second paragraph, lines 15-22).

Page 7: Please provide more information about the log book at what was done with the data collected using this.

We have now provided more information about the child’s PA log book (end of page 12, before the section ‘Statistical processing and data interpretation’).

Page 9: How was AEE calculated?

We have now added the gender-related equation how the accelerometer calculated resting metabolism to determining AEE (page 10, lines 19-23).

Page 11: Were the monitors reset after recordings were taken throughout the day?

We have now added this information (page 12, last paragraph before the section ‘Statistical processing and data interpretation’) - Monitors were not reset after the record the data; at the first day we start with ‘0’ and continuously record the actual values of AEE and step counts.

Page 12, 4th paragraph: does Schooldays refer to time spent in school, or whole school day (wake-up to bedtime)?

We have now rewritten the part of results “During PA intervention (October 2006 – September 2008)”. Schooldays PA comprised the sum of school time PA and leisure time PA. Schooldays paragraph (page 14, lines 17-26) refers to whole school day PA. The description and comparison of the level of PA (steps and AEE) during the school time of schooldays and leisure time of schooldays is located in the next separate paragraph (page 15, lines 13-24).
Page 15, line 8: Are the AEE results presented the right way around?
This has now been corrected, and we also corrected this occurrence at the end of the same paragraph.

Page 17, 2nd paragraph: this slight decrease is interesting, and more detail as to possible explanations for this finding would be useful information
Possible details to explain this finding have now been inserted (page 20, lines 18-25).

Discretionary revisions

1) There are points in the manuscript where bullet points are used. It is recommended that these are removed.
This has now been removed.

2) Figures 1 and 2 could be presented as on Table, or include the actual numbers for the children’s physical activity over time.
The numbers of the children have been added to all figures.