Author’s response to reviews

Title: Effects of school-based interventions on motivation towards physical activity in children and adolescents: protocol for a systematic review

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Title: Effects of school-based interventions on motivation towards physical activity in children and adolescents: protocol for a systematic review

Dear Editor, dear Reviewer,

Thank you very much for the positive and constructive feedback on our revised paper and the invitation to resubmit again. We have revised the paper according to your comments, requests, and suggestions. On the following pages, you can find each comment and our corresponding answer to it.

Reviewer #1: Many thanks for the opportunity to review the revised manuscript. The authors improved the reporting of their study rationale and methodology substantially and the manuscript reads much better now. However, the authors did not address some of the reviewer comments satisfactorily.
1. Reviewer 1 comment 10a - The justification given for not choosing a highly relevant database for this study is rather weak. The authors should at least run a search in the reviewer suggested database (Physical Education Index) and report the extend of overlap between the already selected databases. The authors response "We assume that including a further database will not affect our search results." needs to be backed up.

We will carry out a search in Physical Education Index and we have adjusted the protocol paper accordingly.

2. Reviewer 1 comment 11c - Restriction to English language publications. Please list this eligibility criterion as potential limitation of the review in the Discussion section. "Potential limitations of this review could include the restriction to ...."

We added this to the limitations.

3. Reviewer 1 comment 14b - It appears that the authors misunderstand the meaning of sensitivity analysis. A sensitivity analysis is not restricted to quantitative synthesis of data. It simply means that results of studies with high risk of bias or certain 'outlier' characteristics will be removed from the analysis. Results of the sensitivity analysis should then be compared with the synthesis results emerging from all studies to establish how robust the results are in terms of risk of bias or outliers. The authors should address this comment.

In the course of the GRADE evaluation, we will present the studies with high, moderate and low quality evidence together with the results of each study. Thus, we will be able to draw conclusions even beyond the risk bias and take into account the other relevant aspects of GRADE (Inconsistency, Indirectness, Imprecision, Publication Bias). In this course, we will be able to draw conclusions whether studies with high evidence differ regarding the effects on motivation. We inserted more information on the risk of bias assessment and the GRADE rating on the quality of the evidence on page 11, lines 283 and ff.

4. Reviewer 2 comment 28 - While the authors reported that they will use the findings of the risk of bias assessment in their discussion of the results, they failed to describe how the results of risk of bias assessment will be incorporated in the data synthesis. Conducting a sensitivity analysis as suggested by reviewer 1 (see point 3 above) would meet reviewer 2's comment.

Please see comment above.
5. Reviewer 2 comment 29 - The authors' response "An analysis of meta-bias, i.e. selective reporting or publication bias is not planned." is not satisfactory. The authors should address this point and state in their systematic review protocol how they will establish meta-bias or at least state why they will not be assessing meta-bias. In the latter case, the authors should state this as a limitation of their review in the discussion section.

The analysis of publication bias will be carried out in the course of GRADE (see lines 285 and ff.).

Minor comment: Line 203 (introduction) - Please correct the typo "trail" to "trial".
We corrected the spelling.

Reviewer #2: Thank you for submitting a revised version of your manuscript.
Please, consider the following additional comments.

Abstract
Background. Page 2. The authors' state: "This systematic review aims to collate current findings on the effects of school-based physical activity interventions on a variety of motivational outcomes towards physical activity in children and adolescents aged six to 19 years." Please, edit/replace by: "The main objective of this systematic review will be to analyze the effects of school-based physical activity interventions on a variety of motivational outcomes towards physical activity in school-aged children and adolescents."

Thank you for your suggestion. We edited this paragraph accordingly.

Methods. Page 2. The authors' state: "The databases Scopus, ERIC, MedLine, PsycInfo, Psynex and SportDiscus will be searched using a comprehensive search strategy to identify relevant (randomized) controlled intervention studies trials. interest are studies that provided physical activity components during school lessons including physical education, or during morning, lunch and afternoon breaks. Studies implementing primarily extracurricular physical activity interventions will not be considered." Please, edit/replace by: "Comprehensive literature searches will be conducted in multiple electronic databases, including MEDLINE, Scopus, PsycINFO, ERIC, PSYNDEX and SPORTDiscus. We will include randomized controlled trials and quasi-experimental studies examining the effects of school-based physical activity interventions (e.g. 
physical activity components during school lessons including physical education, or during morning, lunch and afternoon breaks). Primarily extracurricular physical activity interventions will not be considered.”

We made the changes according to your suggestion.

Methods (on outcomes). Page 2. The authors’ state: “Primary outcomes are students' motivation, basic psychological needs, goal orientation, enjoyment, and motivational teaching climate in physical education. Secondary outcomes are the students' physical activity behaviors in-class, during school, and in leisure time. The studies included should be published in English language in peer reviewed journals.” Please, edit as follows: "The primary outcomes will be students' motivation, basic psychological needs, goal orientation, enjoyment, and motivational teaching climate in physical education. Secondary outcomes will be the students' physical activity behaviors in-class, during school, and in leisure time (...). Only peer-reviewed articles published in English will be considered.”

We revised the paragraph accordingly.

Methods. Page 2. The authors' state: "The methodological quality of included studies will be assessed using the Cochrane Risk of Bias Tool. A meta-analysis is not anticipated due to expected variation in interventions, populations and outcomes. The studies will be grouped according to the participants' age and results will be analyzed separately for motivational and physical activity outcomes under consideration of the theoretical background intervention strategies, and methodological quality." Please, edit/revise as follows: "Three reviewers will independently screen all citations and full-text articles, and two reviewers will abstract data. The methodological quality (or risk of bias) of individual studies will be appraised using the Cochrane Risk of Bias tool. Given the anticipated heterogeneity (on interventions, populations and outcomes), it is likely that synthesis will be mostly narrative.”

We edited the paragraph accordingly.

Discussion. Page 2-3. The authors' state: "In order to increase and maintain physical activity levels in children and adolescents, motivation towards physical activity should be sustained. This systematic review can provide information as to which strategies implemented in the school setting are effective in increasing students' motivation towards physical activity, and hence increase their physical activity during school and after-school hours.” Please, edit/revise as follows: "In order to increase and maintain physical activity levels in children and adolescents, motivation towards physical activity should be sustained. It is anticipated that the results of this
systematic review will provide information as to which strategies implemented in the school setting are effective in increasing students' motivation towards physical activity, and hence increase their physical activity during school and after-school hours."

We revised the paragraph accordingly.

Background

Page 3. The authors' state: "Demetriou et al. (2012) found the school-based intervention effects on PA behavior to be partially mediated by self-efficacy (11)." Please, revise and acknowledge this is your own research, as follows: "In a previous study, members of our research team found the school-based intervention (…)".

We corrected this, thank you.

Methods

Page 7. Eligibility criteria. The authors' state: "The studies under review should focus on children and adolescents aged six to 19 years without any known health issues." Please, revise as follows: "Eligible studies should focus on children and adolescents aged 6 to 19 years without any known health issues". Could you please, clarify whether you will exclude studies in overweight, obese children/adolescents or with any other condition?

We revised this paragraph. We are excluding studies that primarily target students with health conditions such as overweight and obesity. We inserted this information on page 8, lines 205-207.

Page 7. Eligibility criteria. Please, describe all interventions of interest (e.g. physical activity components, and give some examples) to allow their replication. Again, please, see TIDieR Checklist: http://www.equator-network.org/reporting-guidelines/tidier/

We inserted more information on the interventions of interest (page 8, lines 200-206).

During the data extraction, we will extract in detail information regarding the frequency, duration, intensity and content of the PA intervention components and describe these in the results section. This has been added on page 10, line 265 and ff.
Page 8. Outcomes. Please, delete lines 187-188: "As the main objective of this systematic review is to analyze effects of school-based PA interventions on the motivation of children and adolescents towards PA".

We deleted this sentence.


Thank you for this suggestion, we provided some examples of questionnaires for evaluating motivational outcomes and PA behavior.

Page 8. Outcomes. Lines 187-197. Please, be more explicit and provide an unambiguous description of the outcomes (as per PRISMA-P). For example, "change scores from baseline or endpoint score at the time point in question on a validated questionnaire". The results of mean values of rating scales can be more sensitive than dichotomous response data. Therefore, they should also be presented even though their interpretation is less intuitive than with dichotomous response data. Change data will be preferred to endpoint data but both will have to be presented separately because we will use the standardised mean difference as an effect size measure for which pooling of endpoint and change data is not appropriate."

Thank you for your comment. We inserted more information on the outcomes on page 9 lines 226-229. We hope this is sufficient.

Page 8. Search strategy. Lines 199-206. Please, delete and edit/revise as follows: "The primary source of literature will be a structured search of six electronic databases: MEDLINE (Ovid), Scopus (Elsevier), PsycINFO (EBSCO), ERIC (EBSCO), PSYNDEX (EBSCO) and SPORTDiscus (EBSCO). The search will include a broad range of terms and keywords. A draft search for MEDLINE (Ovid) and all the rest of databases in EBSCO is provided in Additional file".

We revised this section accordingly.

Page 8. Please, delete Tables 1 and 2, and include in Appendix the draft search for MEDLINE (Ovid) and EBSCO databases. Ideally, please, consult with an Expert Information Specialist/Librarian.
We removed the tables form the main text and added them as supplementary material.

Page 9. Study selection. Lines 211-218. Please, revise as follows: "All articles identified from the literature search will be screened by at least two reviewers independently (YD, AK, and/or DR). First, titles and abstracts of articles returned from initial searches will be screened based on the eligibility criteria outlined above. Second, full texts will be examined in detail and screened for eligibility. Third, references of all considered articles will be hand-searched to identify any relevant report missed in the search strategy. Any disagreements will be resolved by discussion to meet a consensus, if necessary. Records will be managed with EndNote x8 (Clarivate Analytics, Philadelphia, PA, United States)."

Thank you; we corrected the sentences following your suggestion.

Page 10. Data synthesis. The authors' state: "We will summarize effect estimates using the reported p-values for primary and secondary outcomes; p-values ≤0.05 are considered significant." This is not acceptable. Rather than reporting isolated P values, results should include effect sizes and uncertainty metrics for primary and secondary outcomes. Please, extensively revise this section (and follow recommendations as per PRISMA-P, Explanation and elaboration document). Thank you. Additional information here:


Thank you for providing us with additional information and recommendations on effect estimates and data synthesis in systematic reviews. We will include reported effect sizes and confidence intervals wherever stated and additionally the p-values in the summary of results.