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 paper and the invitation to resubmit it. We believe that the quality of the manuscript has now increased due to your valuable input.

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:

General comment: This manuscript described a systematic review study protocol to assess the evidence base on the effectiveness of school-based interventions on physical activity motivation and physical activity outcomes. The authors followed the reporting guidelines of PRISMA-P.

However, the description of study identification and selection, risk of bias assessment and data synthesis require more details in line with guidance set by the Cochrane Collaboration for systematic reviews of interventions.

We have provided more details regarding these points also based on the more specific comments of both reviewers.

The topic of the systematic review focuses strongly on the individual as the agent for changing or maintaining physical activity behaviour. Individual-level interventions have been shown to have limited success in particular for physical activity promotion on population level (e.g. healthy school-aged children). The study would benefit from widening the focus and assessing the role of peers, school community, school policy and school built environment for motivation towards physical activity in children and adolescents. Failing to go beyond the individual level will lead to study results less relevant for practitioners and policy makers.

This is certainly true. Nevertheless, the individual level does play a role in changing physical activity behavior of children and adolescents. Up to now, no systematic review exists that specifically analyses the question set in this systematic review. It would be beyond the scope to include all these factors in one systematic review. We consider our review as one step to better understand the entire picture in order to be able to conduct the ideal school-based intervention program to promote students’ physical activity levels. Further reviews specifically addressing the other factors mentioned should follow.

Specific comments:

Abstract:

1. Methods - The authors should name all databases searched.

Thank you for this comment; we inserted the databases on p.2, line 37.

2. Line 43 - change present tense to future tense in "The studies ….grouped according to their motivational outcomes…”

Thank you for this comment; we corrected accordingly (see page 2, line 51).
3. Line 52 - Please spell out PE as it has not been introduced before.
This has been changed.

4. Line 52 - It would be good to clarify that leisure time refers to school-based leisure time.
Thank you for the comment. We are referring to leisure time in general and not to leisure time during the school day and edited this sentence (see p.3, lines 62-63).

Background:

5. Lines 79-84: The lines on the link between developing theory-based/theory-informed interventions and "identifying effective strategies in changing mediators of behavior" needs to be revised as the link between the two constructs (theoretical framework and mediators) is not clear.
We edited the paragraph and hope that the link between the theoretical framework and mediators is now more clear (see p.4, lines 90-99).

6. Lines 85-104: The background section would benefit from generating two separate paragraphs on

a) possible theoretical frameworks on which interventions to promote motivation for engaging in a particular behaviour can be based on and b) the different types of motivation on which the data synthesis is structured around.

In addition, it is not clear why the authors focused strongly on SDT in their introduction while there are several other suitable theoretical frameworks (e.g. Capability-Opportunity-Motivation Model). If the authors are specifically interested in effectiveness of school-based interventions that were based on SDT vs other theoretical frameworks, then this should be made explicit in the background section (i.e. rationale for the comparison) and data synthesis.

Since the self-determination theory is characterized by the different types of motivation and includes the construct of basic psychological needs, we chose to put a focus on this theory in the introduction. Our outcome variables included the various types of motivation along the autonomy control continuum as well as the basic psychological needs and enjoyment, linked to intrinsic behavior. However, in view of your suggestion, we edited this section by adding further theories and introducing motivational teaching strategies that are based upon these theories.
7. Line 114: Please provide an example of what is meant by "small intervention effect" (how many minutes of increase in school-based (?) physical activity)

We inserted an example (see line 162).

8. Line 121: "weak to moderate magnitude" - This statement should be reconsidered with a population level lens to health promotion. On population level, moderate effect sizes can have substantial impact on health and wellbeing.

We revised the sentence accordingly (see line 170).

9. Line 136: Please add "school-based" between 'towards' and 'PA'

In this review we are looking at intervention in the school setting aiming to influence motivation towards PA. PA in turn could be carried out in the school or at any other time. Therefore, we did not follow your suggestion.

Methods:

10. Search strategy

a) The authors should consider searching the database Physical Education Index (ProQuest) given the topic of their review.

We selected our databases based on previous systematic reviews and meta-analyses conducted in our topic of interest. ProQuest was not included. We assume that including a further database will not affect our search results.

b) The search strategy, described in Table 1, indicates a lack of subject heading (e.g. MeSH). If this is the case indeed, the search strategy needs to be revised as the review would be at high risk of incomplete evidence. If the subject headings were omitted from displaying in the table, the authors should make sure to include them.

The relevant MeSH terms for our search would be “motivation” and “exercise”. Because MeSH terms are primarily for the use in pubmed and for biomedical research they lead to many references that were not helpful for our review. We therefore decided that it is better for this question to restrict to the text word terms.
c) Minor comment: Please replace the term "treatment" with other suitable terminology. The population of interest are not patients and so the interventions are not part of a treatment regime. 

Thank you for the hint, we edited the terminology in Table 1.

11. Eligibility criteria

a) Interventions: Are eligible interventions only those that were implemented in addition to what is part of the school curriculum already? How do the authors intend to identify as to whether an intervention was not already routine practice. Would the authors consider routine practice evaluation as eligible interventions?

Only those studies that implemented an additional or modified PA component, which was not part of the regular school curriculum, during the school day were considered eligible. We checked for a comparator, i.e. a control group, receiving the standard care (curriculum) or an alternative task, and whether the pre and posttests took place immediately before and after the intervention.

b) Line 160: It would improve the clarity of reporting if the authors could provide an example of what they mean by "motivational climate".

Thank you for this advice, we addressed this topic in the introduction (see p.6, lines 145-160).

c) Line 164: It is surprising to see the restriction of the publication language of primary studies to English Language only given the international and multi-lingual co-author team (German, Portuguese, Italian, Greek (?)) The authors should make use of their privilege to be able to cover more than English language literature.

Considering previous systematic reviews published in our topic of interest we decided to include only English published articles. Our research was first not restricted to language and then in a manual step we excluded studies in other languages. The non-English language was primarily Chinese. (we have now already carried out the search).

12. Study selection

a) Selecting records based on the title only introduces a substantial risk of selection bias. The authors should combine screening titles and abstracts in a single step to avoid excluding relevant studies.
We first only screened titles to exclude unrelated articles. This was the case when based on the title it became 100% clear that the study was not related to the topic. In a next step, titles and abstracts were screened together followed by a screening of full texts.

b) Please indicate if title and abstract screening will be done independently by two reviewers. Who will be the reviewers? Please indicate with reviewers’ initials.

We inserted relevant information (see page 10, lines 238-247).

c) How will be disagreement between reviewers resolved at the title and abstract screening stage? Please describe in the methods section.

We inserted the missing information (see page 10, lines 238-247).

d) Do the authors intend to contact corresponding authors of primary studies to obtain additional information helping to determine study eligibility (and missing data - to be described under 'Data extraction')? If not, state why and if yes state how often corresponding authors would be contacted in case of a missing initial response. How long would the review authors wait for a response? Please make this transparent in the review protocol.

We will base the decision for inclusion only on the information provided in the articles and their supplementary files. See data extraction, line 257 for handling missing data while extracting study data.

13. Quality assessment and risk of bias: Please indicate who will do the risk of bias assessment, by how many reviewers and as to whether this will be done independently and how disagreement will be resolved.

Thank you for this important comment. We inserted the missing information on line 262.

14. Data synthesis

a) Line 194: The authors should provide more detail on the narrative synthesis method. Which methods will they use (summary of effect estimates without pooling, combining P-values or vote counting based on the direction of effect) and how will they treat the data? The authors should consider displaying the narrative synthesis in a graph/plot in addition to the GRADE SoF
table. A recent publication indicated the high level of poor reporting of narrative syntheses of quantitative data, which the authors might be interested in reading to avoid making the sadly common mistake (https://doi.org/10.1016/j.jclinepi.2018.08.019)

This important information was missing, thank you for making this comment and providing us with valuable information on the reporting of narrative data syntheses. We provided more details on the data synthesis and hope this is sufficient (see page 11-12, lines 278-295).

b) The authors should describe their consideration of sensitivity analyses based on study quality and use only the most robust findings in their assessment of the quality of evidence.

Because we are not performing a meta-analysis, we will not perform a sensitivity analysis.

Reviewer #2

15. General comment: This paper describes a systematic review protocol of the effects of school-based interventions on a variety of motivational outcomes toward physical activity in children and adolescents. I was asked for an open peer review report and I interpret that to include all aspects of the design and reporting of the systematic review protocol. Overall, this is an interesting protocol in an important topic. The reporting and presentation of background and methods could be improved.

Comments:

16. Abstract. Currently, there are opportunities to improve the transparency of the abstract methods section.

Page 2. Methods. Line 37. The authors’ state: "Six electronic databases will be searched (…)". Please, provide names of all intended electronic databases.

Thank you for this comment; we inserted the databases.

17. Page 2. Methods. Lines 40-41. Please, provide a summary including (physical) interventions of interest. In addition, please provide a summary (list) of outcomes for which data will be sought, including prioritization (e.g. primary and secondary outcomes).

We inserted more information on the studies of interest along with the primary and secondary outcomes (see page 2, lines 41-47).

We inserted this information along with an explanation on page 2, lines 49-50.

19. Page 2. Discussion. Lines 46-50. The authors' state: "To the authors' knowledge, this is the first systematic review that evaluates, (…)". I would omit this from the abstract. You could discuss here dissemination strategy.

Thank you for your suggestion. We edited the discussion accordingly.

Methods

20. Page 6. Line 144. The authors state the final review will be reported using PRISMA and PRISMA extension for Equity (PRISMA-E). Please, clarify why PRISMA-E. Will you identify, extract, and synthesize evidence on (in)equity?

This was a mistake. We do not intend to report this systematic review using to the PRISMA-E extension and removed this information.


Authors should describe all intended information sources (electronic databases, but also other sources such as grey literature sources, contact with authors, etc. if appropriate) with planned dates of coverage.

We do not intend to consider gray literature sources. Authors will be contacted in case full texts cannot be retrieved from the electronic databases searched.

22. Please, present draft of search strategy to be used for at least one electronic database (e.g. Medline), including limits. Could you please clarify whether strategy described in Table 1 is for Medline? Could you please give more references of the databases servers/interfaces e.g. PubMed/Medline or Medline (via Ovid)?

The draft of the search strategy for EBSCO can be now found in Table 2. On page 9, line 232 we included the interfaces of the databases.
23. Pages 6 and 7. Eligibility criteria. Please, describe all interventions of interest (and comparators) to allow their replication. Please, see TIDieR Checklist:

http://www.equator-network.org/reporting-guidelines/tidier/

We provided further information on interventions of interest (see page 8, lines 205-216).

24. Page 7. Outcomes and prioritization. Please, include a new subheading for "outcomes". List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes (e.g. primary and secondary outcomes), with rationale.

We inserted a description of primary and secondary outcomes on page 9, lines 220-230.

25. Page 7. Line 167. Study selection. Authors' could omit the first part sentence ("Utilizing the protocol described in Table 1").

We removed this part of the sentence.

26. Page 7. Line 171. Study selection. Please, provide version for EndNote e.g. EndNote X9 (Clarivate Analytics, Philadelphia, PA, United States).

We added the missing information.

27. Page 7. Lines 172-178. Data extraction. Please, describe planned method of extracting data from reports (e.g. piloting forms, done independently, in duplicate or one researcher with verification of a second researcher), any process for obtaining and confirming data from investigators.

Please, list and define all variables for which data will be sought (in PICO terms), and any pre-planned data assumptions and simplifications (e.g. for eligible interventions included, note whether any will be clustered or merged into the same group or class, with justification).

Thank you for the comment indicating missing information. We provided further details to the data extraction on page 10, line 253 and following.

The variables for which data will be sought are given in Table 1 and 2. Pre-planned data assumptions and simplifications are reported in the section data synthesis (line 284).
28. Page 7. Risk of bias. Lines 179-188. Please, state how this information will be used in data synthesis.

The data synthesis will be performed independently from the risk of bias findings. We will use the information from the risk of bias assessment to discuss the results.


An analysis of meta-bias, i.e. selective reporting or publication bias is not planned.

30. Page 9. Discussion. Please, discuss potential limitations at study (outcome) level, and at review level you anticipate.

We inserted information on anticipated limitations on page 12, lines 310.


We provided information regarding protocol amendments on page 12, line 313.

32. Page 9. Discussion. Please, modify/omit the statement: 
"(line 214) to the authors' knowledge, this is the first systematic review (…)
" by "This protocol present the justification and planned methods for a systematic review that (…)".

We edited the first paragraph of the discussion according to the suggestions made.