Reviewer's report

Title: Intervention components associated with increased effectiveness in dietary and physical activity interventions

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Reviewer: Falk Müller-Riemenschneider

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Title: Intervention components associated with increased effectiveness in dietary and physical activity Interventions

Author: Colin J Greave

General comments:

This carefully conducted and comprehensive review of the literature investigates the effectiveness of specific intervention components in increasing physical activity and/ or reducing weight in order to prevent diabetes mellitus. The authors address this question by conducting a systematic review of systematic reviews and meta-analyses. The research question is important for the promotion of healthy lifestyles and has not been addressed in sufficient detail in the past. In general, the manuscript is well written and the study uses up to date methodology and therefore provides a valuable contribution to the existing literature.

My only main concern relates to the presentation of findings. Mainly due to the vast amount of data they are somewhat difficult to follow and their basis sometimes remains unclear. I am aware of the difficulties in summarising this amount of diverse information in a concise and accurate way, but perhaps this could be improved somewhat.

Specific comments:

Methods:

1. Selection criteria (p. 4):
   a. Clarify difference between systematic review of individual level interventions and systematic reviews of e.g. RCTs, which can be individual level interventions, too.
   b. Define "high cardiovascular disease risk score". Which scores and thresholds were used?

2. Data extraction (p.5): clearly define the content of these pre-defined intervention categories within the methods section.

3. Outcomes (pp. 4-5): Authors define primary and secondary outcomes. However, as at least 4 primary outcomes are stated (weight in kg or BMI, met-hrs per week, and frequency) not considering the different follow-up durations, this distinction seems somewhat problematic.
4. Although this study is a systematic review of reviews, I believe a PRISMA checklist should still be used and provided.

5. Clarify abbreviations: e.g. BMI, met-hrs; once abbreviations introduced use consistently e.g. RCT instead of randomised controlled trial

Results

6. Search results (p. 6):
   a. Please provide more information regarding the results of expert contacts, how were experts selected, how many contacted, responded etc.?
   b. More details regarding the number of excluded studies due to insufficient quality or other exclusion criteria would be interesting. This differentiation could be included in the flow-chart.

7. Supplementary tables:
   a. Abbreviations should be explained beneath tables.
   b. S6 -S13 seem to contain some inconsistencies with regard to the way, effect measures/ effect sizes are presented. In addition to the already existing differences between included studies, this causes even more confusion.

8. Evidence synthesis (pp. 7):
   In general, the amount of presented data is substantial and the current presentation somewhat difficult to follow.
   a. Presented outcomes seem to differ from definitions in the methods section. E.g. overall effectiveness: authors initially present weight loss, followed by reduction in diabetes incidence and physical activity behaviour. Diabetes incidence was defined as a secondary outcome and should be presented in this way, if authors decide to keep this distinction. Within the following findings of intervention components secondary outcomes were not further consistently reported. Instead the duration of follow-up, which was not defined as an outcome is pointed out.
   b. With regard to the duration of intervention effectiveness I was wondering whether this could be presented in terms of e.g. short term (e.g. up to 12 months) and long-term (more than 12 months)?
   c. Theoretical basis (p. 8): evidence of effectiveness is being stated without providing information regarding the outcome(s) in question.

Discussion

9. Effectiveness (pp. 13-14). Currently, the magnitude of intervention effects is almost exclusively reported in supplementary tables. In addition to the evidence of an effect, a presentation of a range of the magnitude of intervention effects (e.g. in terms of proportion being active, weight loss) would be very useful.

10. Please discuss whether findings and conclusions find confirmation in the light of evidence from other target populations (not at risk of diabetes), but e.g. healthy adults, people with diabetes, cardiovascular disease etc. Can these conclusions be applied to other target populations?
11. Regarding the frequency of interventions/contacts (p. 14 first paragraph) it would be useful to state a number or frequency (or a range) of contacts in the conclusions/discussion. A plain statement of more is better does not help much.

12. Strengths and limitations (p. 14): Identified systematic reviews likely include, at least in part, the same primary studies. This might result in double counting or overrepresentations of certain findings. How often was this the case? Please discuss implications.

References
13. WHO reference (2): access date?
14. Reference 13, 18, 29, 35: check format

Level of interest: An article of importance in its field

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