Reviewer's report

Title: The effects of aerobic, resistance, and meditative movement exercise on sleep in individuals with depression: protocol for a systematic review and network meta-analysis

Version: 0 Date: 23 Nov 2018

Reviewer: George Kelley

Reviewer's report:

GENERAL COMMENTS

Thank you for the opportunity to review this protocol to conduct a systematic review with network meta-analysis on aerobic exercise and sleep quality in patients with unipolar depression. This is an important topic and the authors, overall, have done a good job in utilizing available and up-to-date resources to conduct their proposed network meta-analysis. However, a major concern that I have is that I believe that it will be highly unlikely that they will retrieve a sufficient number of studies to conduct and type of meta-analysis, network or otherwise. This is not their fault, but rather, the hypothesized lack of available randomized trials that will meet their inclusion criteria. I elaborate on this in my specific comments that follow. Finally, much of the paper reads more like an outline than a manuscript that flows well. Lines 57 through 60 is one of many examples of this. My specific comments appear below with reference to the line numbers that I believe the reviewer versus journal inserted.

SPECIFIC COMMENTS

Line 14 (Abstract) - Since MEDLINE is nested in PubMed, why not just search PubMed since it will provide you with access to additional biomedical content?

Lines 19 and 20 - Suggest that you delete the two commas in this sentence. Also, since you plan on conducting a network meta-analysis, don't you mean "randomized trials" versus "randomized controlled trials" here? I'm asking because one of the very reasons for conducting a network meta-analysis is for the purpose of including studies that compare the effects of two or more interventions head-to-head and which do not include a comparative control group.

Lines 30-31 - Since there are multiple PRISMA checklists, suggest that you be specific in saying that you will follow the PRISMA Guidelines for network meta-analysis.

Lines 39 - While I traditionally see a PROSPERO registration protocol number upon submission of a protocol for publication, your approach is perfectly logical in my opinion.
Line 40 - Assuming my earlier comment is correct, replace "randomized controlled trial" with "randomized trial".

Line 50 - Suggest you insert "dollars" after the word "billion".

Line 51 - Replace "increase" with "increase"

Line 75 - Did you mean to say "decades" or "decade" here?

Lines 78 through 84 - If you're summarizing the general literature on the effects of exercise on depressive symptoms, there are multiple other systematic reviews with meta-analyses that should probably be cited and mentioned.

Lines 83 - Delete the comma after "relevant".

You probably need to fix the following in accordance with journal guidelines "(cf. [34, 35] for review)"

Depending on what you mean here, either replace "population" with "populations" or insert "a" before the word heterogeneous. Also, please provide a reference for this statement.

Suggest you warrant caution here and say "To the best of our knowledge, no systematic review..."

Delete this sentence since it appears again in the next sentence.

Delete "such as"

Why aerobic exercise only? What not resistance training as well as combined aerobic and resistance training? Also, please provide a definition of aerobic exercise, for example, "any exercise that primarily uses the aerobic energy-producing systems, can improve the capacity and efficiency of these systems, and is effective for improving cardiorespiratory endurance" (see: Physical Activity Guidelines Advisory Committee. Physical activity guidelines advisory report. Washington, DC: US: Department of Health and Human Services, 2008).

What was your rationale for four or more intervention modules? Why not 3 or 5 or 10, etc.,?

Along the same as above, why greater than 2 hours per day? Why not 1 or 3 or 4, etc.,? Personally, I don't see a need for this here.


Replace "afore mentioned" with "aforementioned"

As previously mentioned, since MEDLINE is nested in PubMed, why not just search PubMed since it will provide you with access to additional biomedical content?

Please tell the reader who will be responsible for conducting the searches.
Regardless of the method used to remove duplicates electronically, I would strongly suggest that you also look for duplicates manually. Why? Because electronic approaches almost always miss one or more duplicate citations.

Line 216 - Replace "are" with "will be". On the same line, insert "the" before the word "title".

Line 217 - Replace "are" with "will be". On the same line, and as previously mentioned replace "afore mentioned" with "aforementioned".

Line 222 - Suggest that you include the following reference to support not being blinded: Berlin JA. Does blinding of readers affect the results of meta-analyses? Lancet. 1997;350:185-186. On the same line, please provide the names of the two people who will screen and select the studies.

Line 224 - Please provide the name of the third reviewer.

Line 232 - Insert "the" before "number"

Line 238 - Please provide the names of the two reviewers who will extract data from the studies.

Lines 239 through 242 - Please rewrite the sentence that begins "In case of..." as it is not written correctly.

Line 243 - Please provide the name of the third reviewer.

Lines 243 and 245 - What will be your decision rule about which one to include? The most recent one, the one with the most information, or something else?

Line 248 - Suggest that you replace "points" with "information".

Line 289 - Please provide the names of the two reviewers who will be responsible for assessing the risk of bias. Also, please replace "on" with "at".

Line 291 - Please provide the name of this third reviewer.
Lines 291 through 294 - Will you use this version or the more recent and revised one that was completed in October of 2018?

Lines 307 and 308 - If a network meta-analysis is not possible, what about a traditional pairwise meta-analysis as a possible next step followed by a narrative review if a pairwise meta-analysis is not possible. Given your topic, I don't believe that you will find enough studies to conduct any type of meta-analysis. One way to address this is to conduct a preliminary search. While my suggestion does not necessarily fit the Cochrane ideal, I deal with reality versus ideality.

Lines 314 through 317 - A need exists for more specific information here. For example, would you examine for transitivity of potential effect modifiers across the different pairwise comparisons for each outcome using chi-squared tests for categorical variables and one-way ANOVA tests for continuous variables, with appropriate follow-up tests when necessary?

Lines 318 and 319 - Please provide a reference for how you will calculate the standardized mean difference. For example, will you use Cohen's effect size, Hedge's effect size, or something else? Also, will you use any type of small-sample adjustment such as Hedge's approach?

Lines 321 and 322 - It's important to note that Cohen's cutpoints for standardized mean difference effect sizes are somewhat arbitrary. Also, alternative cutpoints have been proposed (see for example: Sawilowsky SS. New effect size rules of thumb. J Mod Appl Stat Methods. 2009;8(2):597-599). Also, please delete "random-effects before the word "pairwise …" Why? Because random-effects has to do with pooling, not the calculation of each individual effect size.

Line 325 - I'm assuming here that you mean random-effects models will be used to pool findings. Assuming the former, please provide the reference for the random-effects model you will use given that several exist, all of which calculate between-study variances differently.

Line 330 and 331 - What will be your decision rule for deciding on which scale is the "most common" one? In other words, what is you a priori list? Another way to approach this is to pool multiple measures of the same outcome from the same study into one overall effect size. After doing that you could also treat them separately in order to examine any potential association(s) between the instruments used and changes in sleep quality. The same for your other outcomes.

Lines 335 and 336 - What about also including 95% prediction intervals to see what effects might be expected in a new trial?
It's important to understand that the Q statistic measures statistical heterogeneity while I-squared, an extension of Q, assesses inconsistency (see: Higgins JPT, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. Br Med J. 2003;327(7414):557-560).

You will split the direct and indirect evidence and then compare them for any statistically significant differences, correct? If so, then please state this.

So, how will you do this? A global test of inconsistency using a chi-squared test and an alpha value <0.05, or something else?

What do you mean by "study precision"?

This is the first time that I've seen "imputed standard deviations". This should probably be explained back where you talk about calculating your standardized mean difference effect size. I'm assuming here that you're talking about imputing change outcome standard deviations according to an approach such as Follman et al. (see: Follmann D, Elliot P, Suh I, Cutler J. Variance imputation for overviews of clinical trials with continuous response. J Clin Epidemiol. 1992;45:769-773).

Regardless of whether statistical heterogeneity or inconsistency between results from individual studies is found, an examination of potential effect-modifiers using something like meta-regression will still be important. In addition to the factors listed, another covariate that is important to examine is the association between changes in sleep and changes in depressive symptoms as a result of the intervention. Why? Because to the best of my knowledge, we don't know for sure if an intervention improvement in something like sleep quality is the direct result of aerobic exercise or aerobic exercise reducing depressive symptoms, thereby resulting in improved sleep quality.

You mention publication bias but there is no description back in your methods about how you will assess publication bias, more appropriately termed, small-study effects.

Suggest that you insert "best of our" before the word "knowledge".

I don't see the avoidance of Google Scholar" for grey literature as a limitation at all. Given the large number of false-positives currently generated when searching Google Scholar, most librarians would agree that searching Google Scholar is a waste of time.
Since you're limiting your study to aerobic exercise, please insert the word "aerobic" before the word "exercise".

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Please indicate how interesting you found the manuscript:

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**Quality of written English**
Please indicate the quality of language in the manuscript:

Not suitable for publication unless extensively edited

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No