Reviewer's report

Title: Preventive physiotherapy interventions for back care in children and adolescents: A meta-analysis

Version: 4 Date: 12 July 2012

Reviewer: Wolfgang Viechtbauer

Reviewer's report:

Note: The document "Author's response to reviews" only included the original reviews and no responses by the authors (not sure what went wrong here). I therefore inferred the changes made from the revised paper.

The authors now carefully assess the presence and influence of the extreme effect sizes. It also appears that one effect size value (22.033) had been entered incorrectly in the first version of the paper, which now seems to be corrected (to 2.203). There is still the very large effect from Méndez & Gómez (2001), but the authors now describe potential reasons for the large magnitude of this effect and conduct sensitivity analyses to check its influence. Also, the authors now address the fact that there are only few researcher groups conducting these types of studies.

Major Compulsory Revisions

I have one final comment about this paper that I think the authors need to address:

The authors state that the 19 papers reported on 23 independent studies, each one comparing a treatment and a control group. That is not quite correct. For example, Park and Kim (2011) (one of the papers with 2 "studies") included 3 groups: 28 children in a web-based spinal health education program group, 29 children in a traditional face-to-face instruction group, and 31 children in a control group with no intervention. Therefore, when computing the effect sizes for these two "studies", the control group information is used twice (once for comparing the web-based education program group with the control group and once for comparing the face-to-face instruction group with the control group). This leads to statistical dependence in the observed effect sizes (see, for example, chapter 19 by Gleser & Olkin in the Handbook of Research Synthesis and Meta-Analysis), while the authors treat these two effects as independent. I did not check the other papers that produced multiple "studies", but I suspect that this issue may also pertain to Spence et al. (1984), where the two control groups are of exactly the same size.

I would not expect that the conclusions are greatly affected, but this is an issue that needs to be addressed. I see (at least) four ways of doing so:
1) Combine multiple treatment groups into a single treatment group and compute a single effect size estimate. This may complicate the coding of moderators (e.g., treatment modalities may now be mixed).

2) Simply discuss this issue as a limitation of the analyses.

3) Use a multivariate model that accounts for the dependency in the effects.

4) Instead of 3), one could use a simpler approach that is often used in Cochrane reviews, which at least preserves the correct overall sample size. For example, in Park and Kim (2011), a total of \(28 + 29 + 31 = 88\) children participated in the study, but right now, the meta-analysis treats the data from this study as if \(28 + 29 + 31 + 31 = 119\) children had been included. As suggested in the Cochrane Handbook (see 16.5.4: How to include multiple groups from one study), one could "split the 'shared' group into two or more groups with smaller sample size, and include two or more (reasonably independent) comparisons" (p. 510). Therefore, this would mean that the "two" control groups from Park and Kim (2011) are entered into the meta-analysis with 15 and 16 participants. This is only a partial solution to the problem, but is much easier to carry out than using a multivariate model.

Minor Essential Revisions
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Some additional issues/points:

Table 1: The "(a)" and "(b)" entries in the second column do not appear to be in the right place.

Figures 1-4: Please use a wider range for the abscissa so that the points and CIs do not need to be truncated.

Discretionary Revisions
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None.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests.