Reviewer’s report

Title: Effectiveness of therapeutic footwear for children: A systematic review

Version: 0 Date: 23 Jan 2020

Reviewer: Helen Banwell

Reviewer's report:

Thank you for the opportunity to review the manuscript titled 'Effectiveness of therapeutic footwear for children: A systematic review'. This manuscript is a systematic review of impact of corrective or functional footwear on a range of physical and functional outcomes. It offers an alternative, more specific, review of literature to a related scoping review already published with this journal. The overall aim of the paper is to investigate effectiveness of footwear in aiding mobility impairment in children. In my opinion the review will be of interest to readers and adds to the emerging body of knowledge in this area. The approach to the review is structured and robust and the authors should be commended for tackling the topic. There are, however, some areas that can be improved prior to publication. Some around minor formatting issues but also a few things required clarification, and some attention is needed for layout and presentation of results. At this time I am unable to recommend this manuscript for publication but suspect it can be rectified with some attention to the following issues.

General formatting concerns:
1. If you are using a number over 10 it can be numerical. If you have a sentence with a number under 10 and a number over 10, convention allows you use the numerical form for both. Examples where this needs to be addressed are line 232, 389.
2. Similarly, when referring to levels of evidence, it is accepted that roman numerals are used (e.g. line 231, Level 11 evidence).
3. Please change '-' to 'to' when discussing age of participants (e.g. 3 to 7 rather than 3-7)
4. When needing to astrix a result, the convention is that the first is allocated *, the second receives a ^, please review a general 'style manual' for further assistance if needed.
5. Line 200 - change would be to were (always past tense).
6. Line 204 - add a comma after geometry.
7. Line 229 - remove the first comma
8. Line 215 - change supplementary to additional

Clarification:
1. Line 82, the definition and linking of mobility impairment and the ICF-CY needs reworking. The following sentence is also ambiguous, does it mean that 2% of the child pop is living with mobility impairment, or that 2% are living with mobility impairment that may require supportive intervention?
2. Please add the PROSPERO registration number. I would also encourage that the search strategy example be available directly through this article rather than linked to a previous one. Each article should be able to stand alone.
3. Add the word 'trials' behind 'controlled' in line 145.
4. The PICO definitions require attention.
   a. Please change age range to "9 months to 18 years of age" (replace the dash with 'to'),
   b. what definition of 'mobility impairment' was used,
   c. if they ambulated with assistive devices was there any limits on this (e.g. did you include walkers, Zimmer frames, arm or underarm crutches etc.).
5. It is noted that only one reviewer screened the titles and abstracts. This appears to be happening
more frequently, but it has limitations. It is confusing to me why two reviewers then screened full text. Can the authors give reasoning for this. On this same theme, only one person extracted data with a second 'corroborating' author review. Can the authors please clarify how this was handled.

6. Were the survey studies (assessed separately using a different tool) also reviewed for quality by two authors? Please clarify this in the manuscript.

Layout and presentation of results: This is where the most work is required. The authors are to be applauded for attempting to give the reader all the information, but it would be preferred that we get the important information, neatly displayed.

1. Table 1 and Figure 2 need to be combined into one. The figure is nicely presented but it adds nothing to the overall manuscript. I'd also consider adding to this table but simplifying into the following headings: Study, Intervention (CTF or FTF), Modifications/Additions (list extra shanks, lifts etc), N = x (and only report end of study numbers), Condition (simplify and name the condition only e.g. CTEV, Flexible pes planus, Down's syndrome, Typically developing (rather than healthy children), CP - for the one study where there are multiple conditions don't give them numbers, just state 'CP + other' and put a footnote stating a variety of neurological and developmental disorders were present), Duration of study, Gender (report the % of females or males only- 1 column), Age (mean + SD), Mass (mean + SD), Height (mean + SD), BMI (mean + SD) PLUS OUTCOME MEASURES USED (e.g. radiography, physical, functional etc.).

2. Table 2 can be an additional file

3. Table 3, 4 and 5 are too data heavy - I would, at the least, recommend moving the duration of the study to table 1, and then really consider if this is the best way to display outcomes. Forest plots (without meta-analysis) might visually show the impact better. Please also consider what value is there in some of the outcomes reported. For example, does it help the reader that you're separating skeletal geometry into anterioposterior, lateral etc.? and reporting on outcomes where CTF or FTF aren't used (e.g. Group2 BD and Own footwear, in table 3 + Aboutorabi etc.). All results where CTF or FTF aren't used should be removed completely or tabled in an additional file as extraneous results. I would recommend that several of the outcomes from Zabjek et al. and potentially other studies be tabled as 'repetitive outcomes' in an additional file and the authors decide and report on the key relevant results only (e.g. perhaps review 'eyes closed' at one point in time rather across three). Also do not need to report the type of statistical test used (readers can review the study directly if this level of detail is required).

4. Please also refer readers to the table early in the paragraph when discussing results.

5. This is opinion but I'm not sure acknowledging the duplicates in the text of the result section is required (line 208). It is cleaner to state 5003 unique articles were yielded, with a further x....

6. QI outcomes are currently interspersed across results - whilst it's more conventional to often discuss findings as a separate section it is helpful that you've mentioned them directly before the text discussion for each outcome.

7. The Discussion is overly long and needs more work. The majority of the discussion currently revisits and re-reports the findings. This is not the point to a discussion. More synthesis of outcomes would direct the reader on what the findings of this review mean to them as practitioners. Should clinicians look to use CTF or FTF? Are they important in mobility impairment and if so, when and how? If I see a child next week with CP and a limb length difference, should I be discussing footwear over orthoses?

8. Line 414 is a long bow and could be toned down - yes asymptomatic pes planus may not require intervention (yet is often intervened upon) but the full story is not available to us. I would keep mention of the anomaly, but perhaps in a less accusatory way.

9. Limitations need expanding. The requirement of an English abstract needs discussion, the age and data collection method of participants increases change for error and a lack of description of shoe
types and other forms of intervention also require acknowledging.

Thank you for the opportunity to review this manuscript.

**Level of interest**
Please indicate how interesting you found the manuscript:

An article of importance in its field

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

Acceptable

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