Author's response to reviews

Title: Use of manual and powered wheelchair in children with cerebral palsy: a cross-sectional study

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Version: 5 Date: 2 August 2010

Author's response to reviews: see over
Dear Editor, 2010-08-02

Thank you for the review of our paper. The manuscript has been revised according to the additional suggestions provided by the reviewers. Our response to each concern is written point by point below.

Best regards

Elisabet Rodby-Bousquet

Reviewer’s report
Title: Use of manual and powered wheelchair in children with cerebral palsy: a cross-sectional study
Version: 4 Date: 24 July 2010
Reviewer: Jan Willem Gorter

Reviewer’s report:
The authors have addressed the issues raised in my review (and comments of the other two reviewers) and have revised their manuscript accordingly.
I have two minor comments to be addressed.
In the introduction (second paragraph) and discussion the authors make a statement on the difference between capability and performance. The new sentence in the intro states “due to environmental factors...”. I agree that environmental factors are important as well as personal factors (choice, acceptance of disability) and body functions (fatigue) when it comes to use a manually propelled wheelchair, power wheelchair or none, both indoor and out.

Comments
We agree and added your suggestion to the Introduction paragraph 4 and Discussion paragraph 2 and 7. The definition of environment: “the physical, social and attitudinal conditions present in an individual’s life” was put before the distinction between capability and performance. The importance of different factors was pointed out in the Discussion section by discussing postural stability, hand function and wheelchair as a symbol for disability and attitude/acceptance of disability.

In the methods section the data collection (four questions, three answer options) is now clarified. My understanding is that it is the assessor of the study (a PT) who answered the questions, not the child/person with CP or their parents. Is this correct? This should be made clear in the methods section and discussed in the discussion section as a limitation of the study. True performance in the home situation / daily life activities probably can be best measured by asking the person themselves or their parents/caregivers. Also suggestions for future studies looking into more detailed information on performance and use of wheelchairs could be given (use of questionnaires like the ASK, PEDI) and the role of environmental barriers (physical).

Comments
Thank you for pointing that out. The PT asked the questions but it was the children and their caregivers who answered them. We have made an attempt to clarify this in the Method section (paragraph 2) “To obtain information about the child’s wheelchair performance, the children and their caregivers answered the following questions”
Reviewer's report
Title: Use of manual and powered wheelchair in children with cerebral palsy: a cross-sectional study
Version: 4 Date: 21 July 2010
Reviewer: Marjolijn Ketelaar
Reviewer's report:
The manuscript has improved substantially. A research question has been added, making the purpose of the paper much clearer. The number of figures has been reduced substantially, and age has been categorized, both improving the clarity of the results.
However, I still have some questions and comments, mostly related to the results, which are still not yet completely clear.
Maybe I misunderstand the figures, but I get somewhat confused of the percentages in the text compared to the figures. Are the percentages in the figures the percentages of children for each GMFCS level? Thus, adding up to 100% if the children not using a wheelchair would be added?

Comments
Yes, the percentages in Figure 1 are shown for each GMFCS level and in Figure 2 for each CP subtype, adding up to 100% if the children not using a wheelchair were added. The Figures have been altered to clarify this.

To clarify my confusion:
At page 8 you describe “. When I look at figure 1 I see about 43% children with some form of self-mobility (and not 61%), and about 83% - 43% = 40% Attendant operated.

Comments
We agree, the results have been presented differently and have in some places referred to % of the total population and sometimes % of children using wheelchairs or only manual wheelchairs. The text you refer to “ of the wheelchair users at level IV 39% maneuvered their wheelchairs independently while 61% were pushed by an adult” were % of the children using manual wheelchair at GMFCS level IV. The Result section has been revised in order to make it easier to follow.

At the same page you describe that all children at level V require assistance. In Fig 1 I see about 85%.

Comments
All children at level V using a wheelchair need adult assistance but there are some children at level V who do not use a wheelchair. The text has been changed to clarify this and information of the children not using wheelchair was added to Figure 1.
The same confusion for the percentage of the dyskinetic children that were pushed outdoors (page 9). You describe it as 80%. From fig 2 I see about 75%-10% = 65% attendant operated. Please help me out.

Comments
We agree, the results have been presented differently and have in some places referred to % of the total population and sometimes % of children using wheelchairs or only manual wheelchairs. The 80% were children with dyskinetic CP using manual wheelchairs, but since it is difficult to follow the different percentages in text and Figures, the text has been altered.

Minor comment: at page 4 you added a sentence on the role of the environment. Please look very carefully to the definitions in the Holsbeeke-paper. In fact, the physical environment is important in both capability as well as in performance. Environmental factors can play a role in the discrepancy between capacities (standardized controlled environment) and capabilities or performance (both daily, natural environment). To understand differences between capabilities and performance, it is not the influence of the physical environment, it is the influence of the social environment (e.g., parents) and personal factors such as motivation and choices of the child.

Comments
We agree and added your suggestion to the Introduction paragraph 4 and Discussion paragraph 2 and 7. The definition of environment: “the physical, social and attitudinal conditions present in an individual’s life” was put before the distinction between capability and performance. We’ve tried to point out the importance of different factors in the Discussion section by discussing postural stability, hand function and wheelchair as a symbol for disability and attitude/acceptance of disability.

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

Reviewer’s report
Title: Use of manual and powered wheelchair in children with cerebral palsy: a cross-sectional study
Version: 4 Date: 27 July 2010
Reviewer: Annet J Dallmeijer
Reviewer’s report: The paper has been improved by reducing the number of Figures considerably, by adding that it is a cross sectional design and deleting the parts about prediction. However, after reading the paper for the second time I still feel that the results are hard to follow and that there is a discrepancy between results and
conclusions. The authors clarified some aspects in their reply to the reviewers but did not change this in the paper. The introduction is improved by the changes made. Please see suggestion to improve research question below.

**Major Compulsory Revisions**

1. My former comment that the conclusion ‘To achieve a high level of independent mobility, both manual and powered wheelchairs should be considered at an early age for all children with impaired walking ability.’ is not supported by the data, still holds in my opinion. The data show that there is a low level of self mobility in certain groups, which may indicate or suggest that this has a negative effect on their development, but the relationship with the development is not investigated in this study. Please modify the conclusion accordingly.

**Comments**

We still think our conclusion is well supported by the data. The study shows that only 14% of all children using a manual wheelchair outdoors have an independent mobility while a majority using powered wheelchairs operates independently. We do not state that a powered wheelchair should be prescribed to or be suitable for all children. However we are convinced that ‘To achieve a high level of independent mobility, both manual and powered wheelchairs should be considered at an early age for all children with impaired walking ability.’ To meet your demands we have removed the word “all”.

As you pointed out we have not investigated the relationship with the development nor have we mentioned the development in our conclusion, only independent mobility which was the research question. One of the other reviewers stated: “I do like the important and relevant message of the authors that wheelchairs for young children with CP can “liberate’ them instead of being confined to a wheelchair.”

**Discussion**

Avoid repeating results in the discussion and conclusion. This can reduce the length of the discussion. The discussion should be more focussed on the research question. For example the section on postural instability is interesting but it is not clear to me how it relates to the results of the current study.

**Comments**

The reviewers seem to disagree on this. According to the first review by Gorton:“The discussion section addresses nicely the findings”.

Earlier studies show that postural instability restricts functional performance and upper extremity function in children with CP and affects their ability to drive. Of children using manual wheelchairs, 89% became unstable when propelling. This is highly relevant for the discussion of our findings since we found that 86% do not self-propel their manual wheelchairs outdoors. To clarify this, a sentence referring to our results was added to the paragraph.

**Minor Essential Revisions**

1. Research question could be more focussed by adding in ‘relation to’ between ‘indoors and outdoors’ and ‘the degree of independent..’. The last part of the sentence could be changed into ‘for different GMFCS levels, CP subtypes and age groups’.

**Comments**

The research question has been rephrased according to your suggestions.
2. The specific questions about wheeled mobility in the method section do clarify the methods, but I think that they can be summarized in stead of repeating the same question 4 times (discretionary Revision). Please add how options B and C are defined in the questionnaire, since most children are likely to both self propel (B) and being pushed by an adult (C). This specific point should be added to the limitation section.

**Comments**
The questions were specified according to suggestions from another reviewer. However we have now made another attempt to reduce the repeating and revised the Method section paragraph 2. The answers allow the following differences: A child may self-propel indoors and be pushed by an adult outdoors or operate a powered wheelchair and being pushed in a manual wheelchair or reverse. However it’s their most common performance in each wheelchair and environment that was analysed. This has been added as a limitation in the Discussion paragraph 3 according to your suggestion.

3. Methods: Please move the statistical comments that were added to the legends to the text section. I am not a statistician but the Kruskal Wallis test is as far as I know not applicable to proportions.

**Comments**
Kruskal Wallis is a non-parametric test used for two or more independent groups such as the five neurological subtypes. The choice of statistical methods has been verified with a statistician. The information about statistical methods was added to the legends of the Figures and Tables to make the statistical analyses easier to follow according to suggestions by another reviewer. As a compromise, the text has now been removed from Table 1 and in Table 3 it has been removed from the Table legend and added below the Table. Hopefully this will still make the statistics easy to follow.

4. Move last sentence of first paragraph p.7 (The distribution …) to the results section and add statistical results with respect to GMFCS level, CP subtype and age as described on p.8 (There were no…girls 5%).

**Comments**
The description of the subjects is now followed by the explanation to show that there are no significant differences between the age groups, according to your suggestion. However, since it is a description of the study subjects and not of the results it is kept in the Method section paragraph 3.

5. Results Indoor Mobility: change 562 into 556 (6 subjects are missing for indoor mobility). Same applies for outdoor mobility section.

**Comments**
Thank you for pointing this out. Information of the missing subjects has now been added to the Result section paragraph 1 and 5, according to your suggestions.
6. Results: The results are hard to follow because the information is presented differently in text and Figures/Tables. Indoor and Outdoor mobility are described separately in the text but are presented together in the Tables 3 and Fig 1 and 2. Please consider to reorganize this part.

Comments
We agree, the results have been presented differently and have in some places referred to % of the total population and sometimes % of children using wheelchairs or only manual wheelchairs. The text has now been altered in order to make the results easier to follow.

7. Fig 1 and 2: Is the category ‘Attendent Operated’ both manual and powered wheelchair?

Comments
Yes, it refers to both manual and powered wheelchairs. To clarify this, the Figures have been altered as well as the Figure legends.

8. Results: Please always add whether you are talking about manual or powered wheelchair use. P. 8, 1st paragraph: 39% manoeuvred their wheelchairs independently: I can’t find this percentage in the Figure. Does it refer to manual or powered wheelchair use? Last sentence of this paragraph can be removed (For distribution...)

Comments
Information about type of wheelchair has now been added to several paragraphs in the Result section. The last sentence (For distribution...) has been removed from paragraph 2 and 6 of the Result section.

9. Association between use of manual and powered wheelchair with GMFCS level: add to section about GMFCS level on p.8. There is a discrepancy between these results.

Comments
The section about GMFCS on page 8 has been revised and information about manual and powered wheelchairs has been added.

10. References should be checked: Nr 1,2 and 15 have no authors listed.

Comments
The references are listed using Endnote and the style chosen by BMC Pediatrics. The references above have no authors listed in Endnote or Pubmed.

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