Reviewer's report

Title: Staging of mobility, transfer and walking functions of elderly persons based on the codes of the International Classification of Functioning, Disability and Health

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Reviewer: Lois Finch

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Review of BMC MS135000212970094: Staging mobility, transfer and walking functions 1 of elderly persons based on the codes of the International Classification of Functioning, Disability and Health

General comments: The authors have put in considerable work to improve this manuscript which is indeed much improved. The methods section is greatly improved and much easier to follow. The staging of patients is also better and more relevant. The English, however, is still in some places is very stilted and difficult to follow.

Introduction

Specific points

Minor Essential Revisions

Introduction

1. Line 61; I believe the codes are not truly hierarchial but provide increasing precision in the categorization or definition for each function in the domains.

2. Line 63: The ICF is a classification system not a true measurement system unless the qualifying codes are used this is a picky point, but one that needs to be considered. This is stated in the following sentence.

3. Line 82: ICF codes do- not does

4. Line 90 : an instead of the

5. Line 93: you might want to define what a threshold is for those readers not familiar with the word or the concept or further clarify the following sentence as: threshold 5" stair climbing" threshold 4 “walking a short distance”. Etc

6. Line 103: this was- not this is.

7. Line 105: a very short example might help the reader e.g. item XX is not an ICF codable item.

8. Line 117: to be more precise the Rasch model does not require a Guttman probabilistic structure as this would over fit the Rasch Measurement model but it provides a Guttman like response structure; that is the response categories for each item must be order by difficulty. The authors are correct in the following sentences especially in the case of binary response items, but have overstated the Rasch requirements in the first sentence in line 117.
Methods

1. Line 180: If more than 4 items fitted the Rasch model a panel the panel of experts chose the final items based on their applicability in daily care setting thereby providing evidence for face validity of the items. I do not believe that experts think of face validity in choosing items they provide face validity for the items.

2. Line 186 could the authors provide in the methods the age categories used for testing the stability of the scale.

Discussion

1. Page 11 Line 227: I cannot follow this sentence very well. Table 3 is introduced without being presented in the results or interpretation in the discussion. This I believe is a problem of language and a lack of explanation. The legend for the figure is very well explained, however.

2. Line 242: I do not follow the logic here. There was no DIF by location. Are the authors implying that because there is no DIF in their items by location it is more efficient/better than the ICF core sets that are context specific-this statement needs to be made slightly clearer for the reader. The items and codes used here are indeed part of the Activities and Participation brief core set for geriatrics.

3. Line 264: Content validly is more than selecting items from a broad spectrum of items, The authors also used expert opinion to help select items for the scale with this face validity it adds to content validity.

Conclusion

1. Line 286; the authors should add a caveat to their conclusions that once validated these scales could be used..... This statement requires much more validation work on the scale in different setting, populations and cultures before it can be considered true.

Major Compulsory Revisions

Introduction

1. Line 97: is it the individual who agrees with an item or is it that the person is assessed /rated on a particular item and rated as passing.... Or is it the rater who places an individual as passing a particular item... This concept should be in line with the ideals of your manuscript and should match better.

2. Line136: to specify” conditions” this word this could be misinterpreted as medical conditions rather than abilities that I believe the authors meant.

3. Line 155 were the items “asked” or actually assessed with a rate of pass/ fail yes/ no using the binary question’ it now appears that the items are questions in a questionnaire. Do the authors mean “Each item was assessed/rated yes or no using the binary response options to construct a Guttmann type scale...”

4. Line174-177: Do the authors mean 300 samples or a sample of 300. What was the initial sample size that the 300 were drawn from? Additionally, for those readers not informed on Rasch analysis, the authors might like to state why they chose a sample of 300- beyond that the fit is dependent on sample size. In
Rasch a smaller sample is often warranted as we are looking for non-significant results, the criteria used for fit in Rasch, as opposed to other statistical techniques where the large the sample the better as they are looking for insignificant results and significance is dependent on sample size. This should be clearer for the reader. Additionally is 300 a suitable size for this analysis what is it based on

5. Line 192 the missing person data -where these people similar in characteristics to the rest of the sample or were the responses of the sample a biased being only from a better group of patients. A statement to the effect that although the group with missing data was removed their characteristics were similar to those with full data is needed just for completeness.

Results

1. Lines 200 to 203 seem to be more methods than results and some of the text is actually in the methods section

2. Line 211-215: the two groups, development and validation, did not differ by sex- did they differ by age groupings?

Discussion

1. Line 267-268. Because items fit the Rasch model does not provide enough evidence for validity. That the items fit the Rasch models adds evidence for internal validity of the scale but there is not enough evidence for validity. I suggest the authors see Streiner and Norman 3rd edition chapter 10. Validity is about inference an important point for this scale. Inferences have to hold true in a wider sense than a single study for a single population as is stated by the authors in their limitations. Construct validity cannot be satisfied through a single study. The authors have indeed provided evidence for validity, but the statement that they have satisfied construct validity is over stated. This is probably the wrong choice of wording. Construct validity is an ongoing process and includes predictive, known groups, convergent divergent validity dependent on the nomenclature the authors wish to use.

Figure 1 Basic Mobility

2. As each of the items is for an individual person the word do should be replaced by does.

3. Is it correct that the very 1st stage of the person is “1” not a “0” if the person does not change lying position? Does the person have to pass the first item to be in that stage? It is a bit confusing to have the stage picture does not change lying position with a ‘1’ what would be the stage then for the person if they can not change position?

Figure 2 Walking.

1. The item walking is not the same as the item that is stared in the table that item is going out of the home without assistance. This is not walking. For clarity the authors should put in brackets beside the item d450b walking. The ICF d450 is Walking Moving along a surface on foot, step by step, so that one foot is always on the ground, such as when strolling, sauntering, walking forwards, backwards, or sideways. Inclusions: walking short or long distances; walking on
different surfaces; walking around obstacles. It is confusing having going out of the home without assistance as it does not imply walking. Do you mean\textit{do you mean d4501 Walking long distances} Walking for more than a kilometre, such as across a village or town, between villages or across open areas. Could the authors clarify this.

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

**Quality of written English:** Not suitable for publication unless extensively edited

**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