Reviewer’s report

Title: A new clinical test for sensorimotor function of the hand - development and preliminary validation

Version: 0 Date: 09 May 2017

Reviewer: Helen French

Reviewer’s report:

Whilst this is an interesting paper and novel tool which has clinical utility, I have some concerns regarding the claims that the tool has been validated. In my opinion, this paper outline the development and some preliminary validation, but not full validation, of the tool and many of my comments relate to how that should be depicted in the paper.

Title: for the above reasons, I suggest rewording the title to 'A new clinical test for sensorimotor function of the hand - development and preliminary validation'.

Abstract:

Page 2, line 9-11. Reword the aim to 'conduct preliminary validation testing ….'

Page 3: lines 29-30. I do not agree with your conclusion that this is a valid test as its validity as not been fully tested. Please rephrase

Background: Generally well written and rationale for test is provided.

Page 4, line 53; I am unclear what you mean by 'casting sports'. Do you mean 'throwing sports?'

Page 5, line 69. Reword to 'received increasing attention in recent decades'

Page 5, line 72. Unclear what you mean by 'the common clinic'. Do you mean ' in the clinical setting'?

Page 6, Methods. The authors do not appear to have used the COSMIN tool in the conduct and reporting of this study. This is one of the biggest flaws in this study as many of the methodological flaws I refer do would have been identified and addressed correctly by the authors if they had used the tool

Page 6, line 95. Reword 'data was collected' to 'data were collected'
Page 6, line 96 reword ' .. a four weeks period spring 2016' to 'a four week period during Spring 2016.'

Page 6, line 100 change the word 'persons' to 'participants'

Page 6, lines 100-103. These first lines which provide information on the number of those recruited and excluded should be presented at the beginning of the results section, rather than methods.

Page 6, line 105, add the word 'a' between 'as' and 'clinical'

Was a sample size estimation done - how was the sample size of 50 arrived at?

Page 7, line 111 change the word 'accurate' to 'accurately'

Page 7, line 120 change the word 'where' to 'were'

Page 8, line 134. I don't think the software was developed? Maybe it should read ' software programme?'

Page 9, line 160-171, currently this is written in the present tense which is out of sync with the rest of the paper. The methods describe what you did so should be written in the past tense.

Page 9, line 175 suggest rewording to 'were chosen based on whether data were normally distributed or not'.

Page 10, line 180 in relation to those with musculoskeletal pain, is this current or past history of pain - it is important to make the distinction.

Page 10, line 181 reword to 'Independent t-tests were used'

Page 10, line 182 Capitalise as follows: Pearson's Correlation Co-efficient

Page 10, line 184, which type of ICC was used - please refer to COSMIN guidelines

Page 10, line 188 change the word 'with' to 'by'

Results

Page 10, line 193, change to 'The participants included'

Page 10, line 193 change 'are left -handed' to 'were left-handed'

Page 10, line 203 change 'are included ' to 'were included'
Please review the rest of the results section to ensure it is all written in the past tense e.g. line 204, 206, 208, 210, 214 are all written in present tense.

Table 1: please give the units of measure for the measures e.g. is it expressed as a percentage

Table 1: It is unclear what number and bracket number refer to for acuity. Also, please clarify if the 95% CI relates the difference between the 2 hands.

Page 12, lines 221 and 22, you refer to dorsal and palmer direction. Have you explained this in the methods?

Page 13, line 240. The reliability testing refers to intra-session reliability which is a relatively weaker form of reliability compared to between-session reliability. This should be made clearer by the authors and again relates to my earlier points about the validity testing of this tool. To be able to say it is a valid tool, it needs to undergo reliability testing in a patient population over a longer period of time. Again, I refer the authors to the COSMIN tool for more detail on this.

Table 2: is there a difference between clockwise/anti-clockwise and dorsal/palmar movements?

Discussion

Page 14 line 257-258. As indicated previously, this sentence is not justified 'These findings….. in clinical settings' and should be removed. Similarly on page 15, line 276, 'There are several results….' also requires amendment.

Page 16, lines 306-307: further reliability testing should also be done between different testers.

Page 16, lines 313 and 318 changes 'data was' to 'data were'

Page 17 line 328-330. 'Has the … daily activities. This sentence has been posed as a question. Do you mean 'The DTM has….'

Page 16, line 341 Change heading to 'Study Limitations'

Page 18, line 347-349. Reword this sentence to 'Moreover, future studies should include test-retest reliability designs where the test is repeated with a day (suggest longer), a week or longer between test sessions to increase knowledge about repeatability over time.

I would add that further validation is required e.g. construct/criterion validity testing and it should be validated in patient populations.

Figure 6 is blurry and hard to read the p-values. Please provide legends for all figures and tables.

**Are the methods appropriate and well described?**

If not, please specify what is required in your comments to the authors.
Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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