Reviewer's report

Title: Grip strength ratio correlates well with DASH score in different hand conditions

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Reviewer: Kosuke Uehara

Reviewer's report:

This study assesses the correlation between grip strength ratio -- the grip strength of an involved hand divided by contralateral hand or non-injured hand, and DASH in healthy volunteer, after distal radial fracture, and in other different hand condition groups. The findings suggest that this can be useful for assessing the patient who cannot understand any of the 35 language versions of DASH or who cannot fill in the DASH questionnaire for any reason. However, there are several points to consider:

Major Compulsory Revisions

1. While DASH can assess not only patients’ grip strength, but also difficulties of ADL, grip strength’s correlation with ADL is not assessed in this study.

2. Please consider specific mention of the left-handed population in Patients and Methods section. We must consider whether we can deal with the left-handed in the same way as the right-handed. Some studies divided their participants into left-handed and right-handed and analyzed the data for the two groups separately (Clerke A., & Clerke J. Am J Occup Ther, 2001).

Minor Essential Revisions

1. This reviewer would suggest that the authors state that the assessment method described in this study is for limited use only, i.e. when DASH for some reason cannot be used.

2. P2L5: “DASH Outcome Measure 3” -- What is meant by “3”?

3. Please clarify the reasons for the DASH subsections shown in parentheses.

4. Please describe not minimum and maximum age range, but standard deviation.

5. Please describe the mean (and SD) duration after injury and after removal of plaster in Methods. (c.f. P9L13: patients shortly after treatment of a distal radius fracture with a plaster)

6. The following passages mention only about the wrist, but patients included in this study seem not to be limited to wrist patients, but hand patients, as described on P5L9: “Group C consists of 12 patients with different hand conditions such as osteoarthritis, post-traumatic disorders and tendovaginitis.”

1. P3L4: “Function of the wrist”
2. P3L16: “by patients with wrist disorders”
3. P3L26: “The aim of this study is to assess the correlation between grip strength ratio and DASH score in healthy volunteers and patients with wrist disorders in order to simplify outcome measurement.”
4. P4L3: “This study involves analysis of grip strength of 29 patients with wrist conditions”
5. P9L22: “in healthy volunteers and groups of patients with different wrist conditions.”
7. Please mention about normality verification in the setting using MANOVA in the Methods section.
8. Please consider to analyze using not MANOVA but correlation analysis. There is no necessity to use MANOVA, because the authors do not describe about the differences among groups.
9. P6 table: Please confirm the Entire group number is not 39 but 49.
10. P6 table: Please consider to describe to one decimal place in the column of grip strength for group A.
11. In their Discussion section P7L16, the authors state that “Of specific importance is the knowledge that right hand and dominant hand grip scores are higher (statistically significant) compared to left hand and non-dominant hand grip scores.” However, as it has been reported in the literature that the dominant hand is about 1.1 times as strong as the non-dominant hand (Thorngren KG. Acta Orthop Scand, 1979; Clerke A., & Clerke J. Am J Occup Ther, 2001), the authors could consider adjusting their calculations accordingly.
12. P7L15 : “It reflects fairly well how much people can use their hands.” Please provide a reference for that.
13. Limitation

Please consider to mention in the limitation paragraph:
1. That we cannot assess the condition or change accompanying clinical course if the patient has inadequate strength to perform the tasks for the examination as with severe rheumatoid arthritis.
2. That we cannot apply this method in situations of bilateral hand involvement.

Discretionary Revisions
1. P2L11: Please consider to insert a comma after “To exclude personal factors”.

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' below.