Author’s response to reviews

Title: Responsiveness of the Shoulder Pain and Disability Index in patients with adhesive capsulitis

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Author's response to reviews: see over
Cover letter for revised version of SPADI responsiveness study:

Responses to Reviewer Dvir’s report:

**Regarding study population and intervention:** Information which is relevant to the present study is provided in the revised version.

**Regarding presentation of procedures:** We have tried to adjust the study to the common format. In the revised version, parts of the ”Methods” section have been inserted in the ”Background” section, making the ”Methods” section more uniform.

**Regarding external responsiveness:** In the revised version, we have improved on the reporting of external responsiveness, according to recommendations by Husted et al. [21]. Results of multiple regression analysis of the relationship between SPADI and ROM change scores are given.

**Regarding ROM and SPADI as outcome measures:** We agree that the RCP for SPADI is not impressive compared with values for combined movements, especially when you consider that SPADI is calculated from thirteen separate variables, while combined ROM scores are based on only four variables each. Of course, these are different constructs and the comparison may not be fair, but we agree that ROM should have a prominent place among outcome measures for this condition.

**Regarding format:** The structure has been changed so that the manuscript is now more independent. This is the first study to report reproducibility and responsiveness of the SPADI in this diagnostic group. We think it should be published as a separate article given the aims of the study, which are very different from the aims in the two previous papers.

Responses to Reviewer Angst’s report:

1. **Regarding SPADI/ROM comparisons of responsiveness:** The Reviewer argues that comparisons with other self-assessment instruments are necessary to judge whether the SPADI is a responsive tool. We agree that comparisons with similar indices may be important and necessary for making the best possible choice within this growing group of measures. However, comparing responsiveness with different types of instruments may also be adequate, as outlined by Anderson and Chernoff [37]. One may compare SPADI responsiveness to the responsiveness of variables like e.g. pain medication, sick leave, radiological findings or strength indices. In our case ROM was relevant because of the study population/type of intervention plus the fact that in the original article by Roach et al. [1], SPADI/ROM associations were used to demonstrate responsiveness as well as criterion validity.
When comparing responsiveness of ROM and SPADI, we compare the ability to detect change, but truly we may not be comparing the ability to detect the same change. Obviously, this may be important, and we have addressed this issue in the revised "Discussion" section.

2. Regarding comparisons of SRMs: In the revised version, group-level responsiveness is compared by the modified jack-knife test.

3. Regarding normality: In the revised version, formal tests of normality are employed.

4. Regarding aims and hypotheses: These are stated in the revised "Background" section.

5. Regarding comparisons with previous literature: This is done in the revised "Discussion" section.

6. Regarding correlations with ROM: Benchmarks for interpreting correlations vary, but we agree that most of the correlations reported in Table 3 cannot be described as moderate. In the revised version, interpretations are more conservative. Furthermore, we provide a regression analysis which adds to the understanding of the relationship between SPADI and ROM change scores in this study.

7. Regarding RCT: Details of the RCT are given in the revised "Background" section.

8. Regarding Norwegian version: The Norwegian SPADI is submitted as Additional file 1, along with the revised manuscript.

9. Regarding translation process: Various guidelines for such translations have been published. Procedures in our project correspond to the original recommendations proposed by Guillemin et al. [28]. The relevant material has not been submitted to the developers of the SPADI.

10. Regarding RCP: In the revised "Methods" section, the calculation of RCP is more clearly described.

11. Regarding SDD of pain section: The correct SDD is 21. ICC and RCP for SPADI pain also had to be corrected.

12. Regarding decimals: Score data are reported with 1 decimal place in the revised version.