Author's response to reviews

Title: The Disabilities of the Arm, Shoulder and Hand Questionnaire (DASH) can measure the impairment, activity limitations and participation restriction constructs from the International Classification of Functioning, Disability and Health (ICF)

Authors:

Diane Dixon (diane.dixon@stir.ac.uk)
Marie Johnston (m.johnston@abdn.ac.uk)
Margaret McQueen (mmcqueen@staffmail.ed.ac.uk)
Charles Court-Brown (courtbrown@aol.com)

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Author's response to reviews:

Dear Editor

RE: MS: 3257260061917667

The Disabilities of the Arm, Shoulder and Hand Questionnaire (DASH) can measure the International Classification of Functioning, Disability and Health (ICF)

Please find attached a revised version of the above manuscript. We would like to thank the reviewers of our original submission for their thoughtful and constructive comments. We have provided a detailed response to each issue raised by the review process below.

Reviewer 1 raised 5 issues:

1. we have clarified the description of the yes/no decision made by the judges ('procedure' paragraph of the Methods section).

2. a more detailed account of how missing data were coded is provided. Missing data, either a missing Yes/No judgement or a missing confidence rating, were coded as zero. This ensured the weighted judgement of that item for that particular judge was calculated as zero and could be entered into the t-test ('statistical analysis' paragraph of the Methods section).

3. a statement indicating the results will include confidence intervals for the ICCs is provided in the amended manuscript ('statistical analysis' paragraph of the Methods section).

4. table 2 now includes the t-values for all items in relation to all three ICF constructs.

5. the error in reference 5 has been rectified and the remaining references checked for accuracy.
Reviewer 2 raised 3 “minor essential revisions” and provided a series of comments in the form of “major compulsory revisions”. We have provided a response to each type of revision separately.

Minor essential revisions:

1. as suggested, the detailed description of the DASH has been moved to the ‘materials’ paragraph of the Methods section. After careful consideration we have continued to include an initial description of the DCV method in the introduction. We felt it was best placed in the introduction because the method acts to support our argument that discriminant measures are required for theory testing. In addition, DCV is a relatively new method and we felt that its inclusion in the introduction would assist readers in their understanding of the aims of the study and would help orientate them to the more detailed description of the DCV which is provided and referenced in the Methods section.

2. the field of expertise of each of the 24 judges is now detailed (‘participants’ paragraph of the Methods section).

3. table 2 has been modified to include t-values for all items in relation to all three ICF constructs.

Major compulsory revisions

Reviewer 2 raises two main issues in this section of her review. She raises the issue of the utility of the study, especially in relation to its utility for a clinician using the DASH and suggests that health status measures can be valid and clinically useful without covering all relevant theoretical domains.

We entirely agree that health status measures can be clinically useful without their covering all the domains of the ICF. Further, we do not argue that the DCV analysis be used to replace the standard method of scoring the DASH. Rather, we argue that the DCV analysis makes a cumulative contribution to our understanding of health outcomes measured by the DASH. It does not replace the usual scoring method, it simply adds to the scoring options available to the clinician and the researcher. We have amended the discussion section of the revised manuscript to further emphasise this point. We believe the DCV has two particular strengths in relation to improving our understanding of health outcomes and rehabilitation. First, it enables theory testing. The WHO linking system, (as used by Drummond et al, 2007 in their analysis of the DASH) does not identify measurement items that have discriminant content validity in relation to the activity limitations and participation restriction constructs. In order for the ICF to be tested the measures of the constructs within it need to have discriminant validity. The data presented in the current study enable researchers and clinicians to use the DASH to operationalise the ICF such that the relations between the constructs within it can be tested. Without discriminant items any observed relationships between constructs may simply be a reflection of shared content. Second, as we highlight in the paper, the availability of pure construct measures enables a more detailed analysis of the results of intervention studies. Impairment, activity limitations and participation restriction outcomes can be measured without measurement confound. The availability of these data would
support the development of interventions that target particular outcomes and would serve to improve our understanding of the impact of interventions on particular health outcomes. It may very well be that a clinician might want to understand the effect of an intervention on a more global measure of outcome, as provided by the standard scoring system. The DCV analysis does not preclude this because the DASH is administered in the standard way, regardless of which method of scoring is then used. We view the DCV analysis as an addition to the literature on health outcomes not as a replacement scoring protocol. Our aim is to contribute to the development of a cumulative evidence base thereby supporting a scientific approach to the measurement of health outcomes.

We have amended the title of the manuscript.

The editorial process also raised a number of issues. In your letter of the 1st of July you requested we rephrase sections of the introduction and discussion, this we have done. We have also reduced the Methods section by citing previous DCV studies that detail the DCV method. We have reformatted the manuscript to ensure it conforms to the manuscript style.

If you require any additional information please do not hesitate to contact us.

Yours sincerely,
Diane Dixon
Marie Johnston
Margaret McQueen
Charles Court-Brown