Reviewer's report

Title: An initial application of computerized adaptive testing (CAT) for measuring disability in patients with low back pain

Version: 2 Date: 27 October 2008

Reviewer: Alan Jette

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Elhan et al: An initial application of computerized adaptive testing (CAT) for measuring disability in patients with low back pain

Discretionary revisions:

The authors have carefully responded to the comments I made to the earlier version of this manuscript. There is only one concern remaining that relates to the discussion and conclusions drawn by the authors.

The authors’ chief aim in this study was to explore the potential of CAT for measuring disability in patients with LBP based on the definition of disability in ICF which includes impairments, activity limitation, and participation restriction. This is an important undertaking since there exists little evidence to suggest that the ICF can be turned into a reliable and valid measurement system.

I agree with the authors’ conclusion that a combination approach of exploratory factor analysis and Rasch analysis this study has shown that it is possible to calibrate items onto a single metric in a way that can be used to provide the basis of a CAT application. While I do not question the authors evidence of the unidimensionality of the domains that emerged, I do question their interpretation of distinct domains of body functions and activity/participation consistent with how they are defined within the ICF. The results and discussion of this study do not convince me that the dimensions that emerged are consistent with the ICF domains of body functions and activity/participation as defined by the World Health Organization.

After identifying 2 final dimensions represented by the item bank, the authors examined the contents of the items and named one ‘body function’ and the other ‘activity/participation’. The body function items were related to domains of pain, sleep, cognitive and emotional aspects of health. The second dimension named ‘activity/participation’ included items concerned with mobility, self-care activities, domestic life, and social life. Some items that assess social isolation (from the NHP) and some items of understanding and communicating section of WHODAS II are linked with both body function and activity/participation categories. Especially cognitive functions appear in both body function and in activity/participation, such as social cognition. Eight items in the first dimension are linked with both body functions and activity/participation categories, whereas in the second dimension, only 2 items were linked with only body function
category of “energy functions” and not linked with activity/participation categories.

I think this concern could be handled by addressing it more explicitly in the discussion section.

**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 have no competing interests.