Roland Morris Disability Questionnaire in Bengali for Evaluation of Patients With Low Back Pain

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Abstract

Background: Low back pain (LBP) has been identified as one of the most frequent, disabling and costly condition which create a significant clinical and socioeconomic burden on national economy. The Roland Morris Disability Questionnaire (RMDQ) is one of the most commonly used outcome measures in patients with LBP. Objectives: To develop a culturally adapted Bangla version of RMDQ and to test its reliability and validity in patients with low back pain. Materials and Methods: This observational study was carried out from September 2015 to August 2016. The US English RMDQ was translated into Bangla after established cross-cultural adaptation procedures, recommended by Beaton et al. Reliability was assessed by using internal consistency (Cronbach’s alpha coefficient) and inter-rater reliability (the intra-class correlation coefficient - ICC). The Content validity was evaluated by three expert Physiatrists and construct validity was tested by association with the physical functioning (PF-10) subscale of 36-items short form health survey (SF-36).

Results: 100% participants had responded to all items of RMDQ. It was found to have 100% content validity. 50% respondents did not have any difficulty in understanding the Bangla RMDQ and 30% faced difficulty in understanding in 1 item and 20% faced difficulty in 2 items (n=30). The values of Cronbach’s alpha coefficient and ICC were 0.89 and 0.95 respectively. Bangla RMDQ showed good correlation (r=-0.81) with Physical Functioning (PF-10) subscale of SF-36 in assessing construct validity. Conclusion: Bangla RMDQ appears to be an acceptable, reliable, and valid instrument for assessing disability in patients with LBP.

Keywords: Low back pain, RMDQ, disability.
adaptation and validation of RMDQ from English to Bangla arises among the Bangla speaking people with LBP and disability for proper rehabilitation program.

The objective of this study was to develop a culturally adapted Bangla version of RMDQ for use in Bangla speaking people. The developed Bangla version was applied in Bangladeshi patients with LBP to study its acceptability, reliability and validity.

Materials and Methods
This observational study was conducted at the Physical Medicine and Rehabilitation (PM&R) department of Bangabandhu Sheikh Mujib Medical University (BSMMU) during the period of September 2015 to August 2016.

The study was carried out in two phases. In first phase the original English RMDQ was translated to Bangla to make a pre-final questionnaires. We followed Beaton et al.recommendation for phase one. First forward translation of original English questionnaire to Bangla was done by two translators; one of them was without medical background. Then synthesis of a single Bangla version made by both translators. It was back translated into English by two translators totally unaware of the original English version. An expert committee review was made to consolidate all six versions of the questionnaire to develop a pre-final version of Bangla RMDQ. Then its comprehensibility was assessed in ten 12-year-old children and in 30 adult respondents to establish a final Bangla RMDQ. In second phase, we assessed the reliability and validity of the final Bangla version of RMDQ in 48 LBP patients (>30 to >70 years) of both gender who were willing and able to perform all tasks as requested. A sample size of 42 was able to detect a minimally acceptable level of reliability of 0.6 and a hoped for reliability of 0.8, with =0.05 and a power of 80% when test retest method of reliability applied.

Assuming 15% of subjects drop out, a total of 48 subjects were enrolled.

In first visit final Bangla version of RMDQ and validated Bangla version of Physical Functioning Subscale (PF-10) of 36-item Short Form Health Survey (SF-36) were interviewed to the patients or their attendants (where appropriate) and re-interviewed one week apart. Reliability is the consistency of a measure from one use to the next. The reliability of the Bangla version of RMDQ was determined by testing internal consistency and inter-rater reliability. Internal consistency was tested by Cronbach’s alpha coefficient and the inter-rater reliability was assessed by intra-class correlation co-efficient (ICC) which was assessed by Pearson’s correlations between the scores from the 48 patients with LBP who were interviewed twice. We assessed content validity of Bangla RMDQ through calculation of responses by the experts for each question. For assessing construct validity, validated Bangla version of Physical Functioning (PF-10) Subscale of SF-36 was compared with Bangla version of RMDQ by examining Pearson’s correlations between the scales.

Descriptive statistics were used to examine the completeness of the data and to characterize the score distributions, including scale ranges, means, standard deviations, and floor and ceiling effects. All statistical analysis was done by using SPSS windows version 22.

The study was approved by the Ethical committee of BSMMU and performed following the declaration of Helsinki principles. Informed consents were obtained from the patients.

Results
The English RMDQ (Table I) was translated into Bangla RMDQ (Table II). All the participants 100% responded to all items of RMDQ. There was no missing value for the scale scores. No one had any problem to answer any item. Out of 48 patients 25 were males (52.08%) and 23 were females (41.67%). Mean age of the test population was 47.08 ± 10.81 and age range from 30 to 70 years and predominantly middle to elderly people. Among the respondents, 6 were illiterate, 15 (35.4%) were house-wives, three were service holder and seven were businessmen. 4, 6 and 4 were unemployed, farmer and retired persons respectively.

Internal consistency was acceptable, with Cronbach’s alpha coefficient for all 24 items of RMDQ is 0.89 (Table III) (Table IV). Alpha should be > 0.7 or 0.8, which is standard for all scales. The test-retest for reliability and correlation of RMDQ was significant at the level of 0.01 (Table V). The inter-rater reliability was assessed by ICC, the value was 0.95 and was highly significant (Table VI).

The content validity was assessed by index of content validity (ICV). ICV was assessed by three experts in the field of Physiatry, each expert rated each item as either 1 (agreed), 0 (undetermined), or -1 (disagreed). The ICV of each item was then calculated using summation of scores from each expert divided by the number of experts. Result showed 100% content validity of final Bangla version of RMDQ. Whereas, for assessing construct validity, validated Bangla version of SF-36 was compared with Bangla version of RMDQ by examining Pearson’s correlations between the scales. There was negative correlation between them indicates positive association which was statistically significant (Table VII).

Table I: The Roland-Morris Disability Questionnaire

When your back hurts, you may find it difficult to do some of the things you normally do.

This list contains sentences that people have used to describe themselves when they have back pain. When you read them, you may find that some stand out because they describe you today.

As you read the list, think of yourself today. When you read a sentence that describes you today, put a tick against it. If the sentence does not describe you, then leave the space blank and go on to the next one. Remember, only tick the sentence if you are sure it describes you today.
1. I stay at home most of the time because of my back.
2. I change position frequently to try and get my back comfortable.
3. I walk more slowly than usual because of my back.
4. Because of my back, I am not doing any of the jobs that I usually do around the house.
5. Because of my back, I use a handrail to get upstairs.
6. Because of my back, I lie down to rest more often.
7. Because of my back, I have to hold on to something to get out of an easy chair.
8. Because of my back, I try to get other people to do things for me.
9. I get dressed more slowly than usual because of my back.
10. I only stand for short periods of time because of my back.
11. Because of my back, I try not to bend or kneel down.
12. I find it difficult to get out of a chair because of my back.
13. My back is painful almost all the time.
14. I find it difficult to turn over in bed because of my back.
15. My appetite is not very good because of my back pain.
16. I have trouble putting on my socks (or stockings) because of the pain in my back.
17. I only walk short distances because of my back.
18. I sleep less well because of my back.
19. Because of my back pain, I get dressed with help from someone else.
20. I sit down for most of the day because of my back.
21. I avoid heavy jobs around the house because of my back.
22. Because of my back pain, I am more irritable and bad tempered with people than usual.
23. Because of my back, I go upstairs more slowly than usual.
24. I stay in bed most of the time because of my back.

Table II: Final Bengali Version of Roland Morris Disability Questionnaire (RMDQ)

| No of Items | Cronbach's Alpha |
|-------------|------------------|
| 24          | 0.89             |

Table III: Internal consistency of RMDQ (Cronbach's alpha coefficient)

| Questions (Items) | Chronbach's alpha |
|-------------------|-------------------|
| Question 1        | 0.90              |
| Question 2        | 0.80              |
| Question 3        | 0.88              |
| Question 4        | 0.92              |
| Question 5        | 0.86              |
| Question 6        | 0.90              |
| Question 7        | 0.81              |
| Question 8        | 0.86              |
| Question 9        | 0.83              |
| Question 10       | 0.78              |
| Question 11       | 0.71              |
| Question 12       | 0.93              |
| Question 13       | 0.87              |
| Question 14       | 0.83              |
| Question 15       | 0.80              |
| Question 16       | 0.74              |
| Question 17       | 0.88              |
| Question 18       | 0.92              |
| Question 19       | 0.83              |
| Question 20       | 0.89              |
| Question 21       | 0.90              |
| Question 22       | 0.86              |
| Question 23       | 0.88              |
| Question 24       | 0.91              |
Average Measures (n=48)

In this study, the standard US English RMDQ was culturally translated and adapted for use in the Bangladeshi culture in accordance with standard methodology.

#### Discussion

An Important Consideration When Using An Outcome Measure tool is the cultural appropriateness of the measure. In this study, the standard US English RMDQ was cross-culturally translated and adapted for use in the Bangladeshi culture in accordance with standard methodology.

The findings showed that the interviewer-administered Bangla RMDQ appears to be an acceptable, reliable, and valid instrument for measuring disability in Bangladeshi patients with LBP.

The translation was straightforward for most of the items except item (পেন্সিল, ইংরেজ়ায়, প্রাক্তন, বিভাগ) could understand after explanation. After consulting with the expert committee, some of these words were simplified as much as possible. In adult respondents, most of the items were well understood by the participants and responses were spontaneous. No one had any problem to answer any item but had some difficulty in understanding some items.15 (50%) of them had completely understood all the items, 9 (30%) faced difficulty in understanding in 1 item and 6 (20%) faced difficulty in understanding in 2 items. The Bangla meaning of "jobs that I usually do around the house" (পৃথিবী কাজ) did not well understood by the respondents of low educational background or least idea about proper Bangla language except local language. Hundred percent of the items of the instrument were scored well by the evaluation of expert physiatrists reflecting higher comprehensibility and content validity.

The reliability measurement indicates whether it will give the same result on different occasions. The sample size for this study was determined based on the test-retest repeatability parameter. In first visit, final Bangla version of RMDQ and validated Bangla version of SF-36 were interviewed to the patients and answers were recorded. It took average time of 15 minutes to complete. After 01 week, again data were collected in the same manner. Percentage of dropout was 8.3%. Collected data were then assessed for validity and reliability. Our obtained internal consistency of Bengali RMDQ with Cronbach's alpha coefficient for all 24 items is 0.89. It is acceptable as the Cronbach's alpha should be > 0.7 or 0.8 which is standard for all scales. These figures are close to 0.94 for Tunisian version, 0.904 for Argentina version, 0.88 for Polan version, 0.93 for Thai version, 0.89 for Turkish version, 0.87 for simplified Chinese version.10-14 For test-retest reliability, our calculated RMDQ ICC is 0.95 which is close to the ICC of 0.91, 0.9, 0.91 and 0.94 by other studies.15,16 Construct validity was assessed by examining the correlation between Bangla RMDQ and Bangla SF-36; their Pearson Correlation was -0.81. In RMDQ, higher score and in SF-36, a lower score means more severe symptoms. Consequently a negative correlation with SF-36 indicates a positive association.

#### Conclusion

The translated and culturally adapted RMDQ instrument is a valid and reliable instrument and can be used by physican, other health care professionals, health researchers, clinical investigators and health care policy makers to use in clinical practice, conducting clinical trial and in evaluating health care policy for Bangladeshi people with disability in days to come.
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