Original Article

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 (Cronbachs' 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 Cronbachs' 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.*

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Introduction

Low back pain (LBP) is very common, experienced at some time in life by up to 80% of population.[1] It is defined as pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with or without referred leg pain.[2] The 2010 Global Burden of Disease Study estimated that LBP is among the top 10 diseases and injuries that account for the highest number of disability-adjusted life year worldwide.[3] Standardized self-report questionnaires provide a convenient method of collecting and synthesizing a large amount of information on activity limitation.[4] The Roland-Morris Disability Questionnaire (RMDQ) for disability secondary to LBP is a validated and popular instrument in clinical practice and research.[5,6]

The original English version of the RMDQ was published by Roland and Morris in 1983, and translated and cross culturally adapted in 36 versions. RMDQ is quick and easy handling, takes ten minutes on average, and can be readily scored besides.Its' wide use in different studies carried out worldwide, have convinced the need to develop a version to be used in Bangladesh. The growing international collaboration in clinical research, the importance for translation, cross-cultural

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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.[7] 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.[8] 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.[9] The reliability of the Bangla version of RMDQ was determined by testing internal consistency and inter-rater reliability. Internal consistency was tested by Cronbachs' alpha coefficientand 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, 5 can read and write, 16 studied up to primary level and 8, 10 respondents completed Secondary School Certificate (SSC), Higher Secondary School Certificate (HSC) respectively. The remaining three had completed higher education (graduation with or without Masters). Regarding profession of 48 subjects, 17 (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 Cronbachs' 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.[6] 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 Pearsons' 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)

যখন আপনার কোমর ব্যথা করে, তখন আপনার কিছু কাজ করতে কষ্ট হয় যা আপনি সাধারণত করে থাকেন। নিচের তালিকায় এমন কিছু বাক্য রয়েছে যখন তারা কোমর ব্যথায় আক্রান্ত তখন নিজেদের কে প্রকাশ করে থাকেন। আপনি যখন এগুলো পড়বেন তখন এমন কিছু বাক্য পাবেন যা আপনার আজকের অবস্থাকে প্রকাশ করে।

আপনি তালিকাটি পড়ার সময় নিজের অবস্থা চিন্তা করে নিবেন। যখন আপনি একটি বাক্য পড়বেন যা আপনাকে আজ বর্ণনা করে তার পাশে একটি টিক দিবেন। যদি কোন বাক্য আপনার অবস্থাকে প্রকাশ না করে, আপনি সেটি খালি রেখে পরেরটিতে যাবেন। মনে রাখবেন, শুধু সে বাক্যটির পাশে টিক দিবেন যা আপনার আজকের অবস্থাকে প্রকাশ করে।

১. কোমরে ব্যথার কারণে আমি বেশির ভাগ সময় বাসায়/বাড়িতে থাকি।
২. কোমরে আরাম পাওয়ার জন্য আমি বারবার দেহের অবস্থান বদলাই।
৩. কোমরে ব্যথার কারণে আমি আগের চেয়ে অনেক আস্তে হাঁটি।
৪. কোমরে ব্যথার কারণে আমি সাধারণ বাড়ির কাজও করতে পারছি না।
৫. কোমরে ব্যথার কারণে আমি সিঁড়ির রেলিং ধরে উপরে উঠি।
৬. ব্যথার কারণে আমাকে প্রায়ই শুয়ে থাকতে হয়।
৭. কোমরে ব্যথার কারণে আরামদায়ক চেয়ার থেকে উঠতে আমাকে কিছু একটা ধরতে হয়।
৮. কোমরে ব্যথার কারণে আমার কাজ অন্যকে দিয়ে করিয়ে নেই।
৯. কোমর ব্যথার কারণে আমি স্বাভাবিকের চেয়ে ধীরে ধীরে কাপড় চোপড় পরি।
১০. ব্যথার কারণে আমি বেশীক্ষণ দাঁড়িয়ে থাকতে পারি না।
১১. কোমর ব্যথার কারণে আমি সামনে ঝোকা কিংবা হাঁটু গেড়ে বসার চেষ্টা করি না।
১২. কোমর ব্যথার কারণে আমার চেয়ার থেকে উঠতে কষ্ট হয়।
১৩. বেশির ভাগ সময়ই আমার কোমর ব্যথা থাকে।
১৪. কোমর ব্যথার কারণে বিছানায় পাশ ফিরতে আমার সমস্যা হয়।
১৫. কোমরে ব্যথার কারণে আমার খিদেও কমে গেছে।
১৬. কোমরে ব্যথার কারণে আমার মোজা পরতে সমস্যা হয়।
১৭. কোমর ব্যথার কারণে আমি বেশি দূর হাঁটতে পারি না।
১৮. কোমর ব্যথার কারণে আমার ভালো ঘুম হয় না।
১৯. ব্যথার জন্য আমার জামা-কাপড় পরতে অন্যের সাহায্য নিতে হয়।
২০. কোমর ব্যথার কারণে দিনের অধিকাংশ সময় আমি বসে থাকি।
২১. কোমর ব্যথার কারণে আমি গৃহস্থালির ভারী কাজ এড়িয়ে চলি।
২২. কোমর ব্যথার কারণে আমি অল্পতেই রেগে যাই এবং মেজাজ খিট খিটে থাকে।
২৩. কোমর ব্যথার কারণে আমি স্বাভাবিকের চেয়ে ধীরে সিঁড়ি বেয়ে উঠি।
২৪. কোমর ব্যথার কারণে আমি বেশির ভাগ সময় বিছানায় শুয়ে থাকি।

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

	No of Items	Cronbach's Alpha
RMDQ (overall)	24	0.89

Table IV: Internal consistency (Cronbach's alpha coefficient) of each questions

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 18	0.83
Question 20	0.89
Question 21	0.90
Question 22	0.86
Question 23	0.88
Question 24	0.91

Table V: Test-retest reliability and correlation of RMDQ (n=48)

no	Test		Re test		Correlation	P-value
	Mean	SD	Mean	SD		
1	9.6136	4.93157	9.6364	4.74208	.998**	0.00
2	9.0000	4.68440	9.0000	4.68440	.990**	0.00
3	8.9318	4.46902	9.9545	4.47781	.995**	0.00
4	9.1364	4.65081	9.1818	4.67433	.928**	0.00
5	8.9091	3.42760	8.9318	3.40427	.995**	0.00
6	9.8864	4.36766	9.8864	4.36766	.996**	0.00
7	9.4091	4.70250	9.4318	4.68988	.993**	0.00
8	9.2727	4.60470	9.2727	4.60470	.910**	0.00
9	9.7273	4.08614	9.7273	4.08614	1.000**	0.00
10	8.8864	4.43407	8.8182	4.21054	.930**	0.00
11	9.8409	4.44581	9.9409	4.44581	.970**	0.00
12	9.3409	4.44581	9.3409	4.44581	.987**	0.00
13	9.2500	4.24125	9.0682	5.83254	.906**	0.00
14	9.1364	4.65081	9.1818	4.67433	.928**	0.00
15	9.2045	4.51856	9.1860	4.53151	.930**	0.00
16	8.7273	4.85978	9.7273	4.85978	.920**	0.00
17	9.6818	4.81432	4.7273	9.95690	.992**	0.00
18	9.0455	4.28193	9.1136	4.29475	.983**	0.00
19	9.2955	4.10845	9.3182	4.08843	.996**	0.00
20	8.2955	4.10845	8.3182	4.08843	.996**	0.00
21	9.3409	9.44581	4.3409	4.44581	.901**	0.00
22	8.1364	4.65081	8.1818	4.67433	.928**	0.00
23	9.1364	4.65081	9.1818	4.67433	.928**	0.00
24	9.8864	3.65081	3.1818	1.67433	.928**	0.00

SD= Standard Deviation
** Correlation is significant at the 0.01 level

Table VI: Test-retest reliability, Intra-class Correlation Co-efficient (ICC) of RMDQ (n=48)

	Intraclass Correlation	95% Confidence Interval	
		Lower Bound	Upper Bound
Single Measures	.721	.627	.811
Average Measures	.953	.944	.977

Table VII: Construct validity of RMDQ (Pearson's Correlation) (n=48)

N=48		Pearson Correlation	P-value
RMDQ	SF – 36 PF -10	-0.81**	0.000

** Correlation is significant at the 0.01 level.

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 (যথেষ্ট, ইজিচেয়ার,গৃহস্থালি,অধিকাংশ) 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" (গৃহস্থালি 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 Cronbachs' alpha should be > 0.7 or 0.8 which is standard for all scales. These fi gures 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 physician, 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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