

Translation, Adaptation, and Reliability of Modern Standard Arabic Version of the Roland Morris Disability Questionnaire

Hani Al-Abbad^{1*} and Ahmad Al-Howimel²

¹Physical Therapy Department, King Fahad Medical City, Riyadh, Saudi Arabia

²Department of Rehabilitation Sciences, College of Applied Medical Sciences, Salman Bin Abdulaziz University, Saudi Arabia

*Corresponding author: Hani Al-Abbad, Physical Therapy Department, King Fahad Medical City, Riyadh, Saudi Arabia, Tel: +966-112889999; E-mail: hmalabbad@kfmc.med.sa

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Abstract

Purpose: To culturally translate and test the reliability and validity of the Modern Standard Arabic version of Roland-Morris Disability Questionnaire (RMDQ) for chronic non-specific low back pain (LBP) in the Arabic-speaking population.

Background: The RMDQ is a popular reliable and validated tool for measuring functional disability in low back pain. However, a reliable Modern Standard Arabic version is not available.

Methods: The RMDQ Modern Standard Arabic translation and cross-cultural adaptation was performed using the "forward translation/backward translation" method. The final version was tested among Arabic-speaking chronic non-specific LBP patients. The internal consistency was assessed by means of the Cronbach's alpha coefficient. The convergent validity was assessed calculating Pearson's correlation coefficient comparing the RMDQ's results with the amount of pain that was assessed by the visual analogue scale (VAS), and the range of movement of the spine by fingertip-floor length test (FFL).

Results: A total of 40 participants (mean age 44.4 years (SD: 12.51), 65% female) were enrolled in the study. The internal consistency (Cronbach's alpha) within a seven-day interval was 0.948 indicating adequate acceptance. The RMDQ's convergent validity showed positive correlation with the VAS ($r: 0.299; P < 0.061$) and with the FFL ($r: 0.292; P < 0.067$).

Conclusion: The Modern Standard Arabic version of the RMDQ has good internal consistency and reliability to be a useful clinical and research tool for the assessment of functional disability caused by LBP among the Arabic-speaking population.

Keywords: Low back pain; Disability; Roland morris questionnaire; Arabic version

Introduction:

Low back pain (LBP) is a universal health problem affecting up to 80% of the general public at least once in their lifetime [1]. LBP can result from different pathological conditions, but 85% of the reported symptoms are not specific to certain pathoanatomical or radiological abnormality [2]. Chronic and recurrent LBP is considered to be the most challenging type as there are no clear, effective diagnostic and management approaches. The difficulty to either diagnose or treat chronic LBP has been attributed to multifactorial bio-psycho-social dimensions of the disorder [3].

It accounts for considerable direct and indirect costs in Western countries including health care, compensation claims and work absenteeism. LBP has a considerable impact on patients' functional level affecting daily life activities including walking, work demands, leisure activities and psychosocial aspects leading to disability [4,5]. Although LBP is largely perceived by patients as only a painful condition, it has substantial functional disability consequences. It is

essential to explore the impact of LBP on the person's daily functional activities to be considered in the management plan.

The prevalence of LBP is under-investigated in Arab countries due to differences in life style and disability insurance policies compared to Western societies. Al-Arfaj et al., [6] reported LBP is less prevalent in Saudi Arabia compared to Western countries, but has similar socio-medical consequences.

One of the main barriers to exploring the prevalence and impact of LBP among the general public is the lack of a reliable and culturally-adapted self-reporting tool. The Roland Morris Disability Questionnaire (RMDQ), first established in 1983 is among the popular clinical tools for assessing LBP. It is a simple and short self-administered questionnaire by the patient that quantifies functional disability caused by LBP. The original English RMDQ has adequate reliability, validity, and responsiveness [7]. The RMDQ has been translated and culturally adapted into many languages including German [8], Spanish [9], Italian [10], French [11], Brazilian [12], Argentinean [13], Turkish [14], Moroccan [15], Tunisian [16], Japanese [17], Korean [18] and Chinese [19].

Arabic is spoken across a wide arc of territory stretching across the Middle East and North Africa. Considering all the regional variations, it has been reported that there are 300-340 million native Arabic speakers world-wide [20]. Many of the spoken varieties are mutually unintelligible, and the varieties as a whole constitute a sociolinguistic language. Nevertheless, all Arabic speakers are unified by Literary Arabic, which is the official language of 26 Arab states and the liturgical language of Islam. Modern Standard Arabic largely follows the grammatical standards of Quranic Arabic and uses much of the same vocabulary [20]. Although the Moroccan [15] and Tunisian [16] translations of the RMDQ provide an Arabic version of the questionnaire, these translations used colloquial text that would be very difficult to understand by citizens of the other Arabic-speaking countries.

Because the psychometric properties of a Modern Standard Arabic version of the RMDQ has not been established, the primary aim of this study was to assess the reliability and validity of a new Modern Standard Arabic version of the RMDQ among Arabic-speaking patients with chronic LBP.

Methods

Translation and cross-cultural adaption

We followed the guidelines for the translation and cultural adaptation process of self-reported outcomes by Beaton et al., [21] and Wild et al., [22]. The process involved first forward translation of the original version of the RMDQ into Arabic by two independent translators. One was a professional bilingual translator who had advanced training in language translation and had no prior knowledge of the questionnaire (T1), while the other was a bilingual physical therapist who was familiar with the use of the questionnaire (T2). Primary Modern Standard Arabic version (T12) was formulated through consensus between the two translators by discussion and resolved by comparing the two versions. The second stage involved backward translation of the synthesized T12 into English by two independent bilingual translators who were not aware of the original version. This last version was compared to the original version of the questionnaire by a review panel to detect misinterpretations to produce a pre-final version through consensus. Reliability testing was then done on a sample of convenience of LBP patients to ensure comprehensibility of the questionnaire and to synthesize a final version. The sample size was calculated using the WHO sample size calculator for prevalence studies to assess the prevalence of low back pain (LBP) 12% [23] with 95% confidence interval and 10% margin of error. Hence we enrolled 40 LBP patients with 80% power to detect significant difference at two sided significance level.

Participants

The inclusion criteria included native Arabic-speaking patients (>18 years of age) with chronic non-specific LBP lasting at least three months and who were referred to a physical therapy out-patient clinic. Patients with systemic disorders that affect their daily tasks or may cause functional disabilities were excluded. Additionally, subjects who had previous spinal surgery, congenital deformities or who were pregnant were also excluded. The study was approved by the Hospital Institutional Research and Ethics Board and all participants gave informed consent.

Procedures

The baseline assessment was performed by a qualified physical therapist with postgraduate degree and eight years of experience. Outcome measures included demographic details, body mass index, duration of LBP, level of pain on the visual analogue scale (VAS) ranging from 0 to 100 mm, lumbar spine mobility measured by fingertip-floor length test (FFL) in centimeters, and functional disability by the translated RMDQ. The patient was then given an appointment to return within seven days from the first interview to fill out the RMDQ again before the beginning of their therapy to avoid treatment effect.

Statistical Analysis

The reproducibility of Modern Standard Arabic RMDQ version was tested using the intraclass correlation coefficient (ICC). Internal consistency within seven days period using Cronbach's alpha was used to examine the questionnaire item homogeneity, a statistic used to calculate the mean of all possible split-half combinations.

Since no gold standard exists against which to compare the questionnaire, construct validity becomes the most useful form of external validity. Here, the instrument is compared with other variables in which there would be an expected level of agreement (convergent validity).

Convergent validity was assessed using Pearson's correlation coefficient to compare the RMDQ results with other measured variables at baseline.

Results

A total of 40 participants were enrolled in the study. Their demographic and clinical characteristics are shown in Table 1.

Characteristics	Categories	n (%) / Mean ± S.D
Gender	Male	14 (35%)
	Female	26 (65%)
Age		44.4 ± 12.5
BMI		31.4 ± 6.2
LBP duration (Months)		78.4 ± 74.5
VAS (0-100)		52.6 ± 20.4
FFL (cm)		13.7 ± 13.2
RMDQ Score 1		12.5 ± 5.0
RMDQ Score 2		12.5 ± 5.3

Table 1: Baseline Clinical Characteristics of Participant (n = 40)

We assumed that participants had good comprehension of the questionnaire since no patient requested help in interpretation despite prior instruction. All subjects could complete the questionnaire in less than five minutes.

Reliability: The test-retest reliability assessed in all 40 patients within a 7-day interval by means of ICC was 0.902. The internal consistency is used in psychometrics to ensure that all test items

measure the same variable. The internal consistency estimated by means of Cronbach's alpha was 0.948 indicating adequate acceptance (Table 2).

Characteristics	N	Minimum	Maximum	Correlation	Cronba Alfa
RMDQ Score 1	40	2	21	0.902	0.948
RMDQ Score 2	40	2	22		

Table 2: Reliability of RMDQ Scores (n = 40)

Convergent validity: Convergent validity was measured comparing the RMDQ results with all variables measured at baseline. Pearson's correlation coefficients were used as the data were either normally distributed or parametric.

Pain level as measured by the VAS and spine range of movement measured by FFL showed a positive correlation. The RMDQ/VAS correlation was positive but not statistically significant ($r:0.299$; $P<0.061$). Also the RMDQ/FFL correlation was positive but not statistically significant ($r:0.292$; $P<0.067$). The correlation with other variables did not show statistical significance (Table 3).

Characteristics	Correlation with RMDQ1	P – value
Age	0.065	0.692
BMI	-0.81	0.62
LBP duration	0.072	0.661
VAS	0.299	0.061
FFL	0.292	0.067

Table 3: Pearson's Correlation Coefficients of the RMDQ with Age, BMI, Duration of Pain, and Spinal Mobility (n=40)

Discussion

The result of this study suggests that the RMDQ translated into Modern Standard Arabic version is as reliable as the original version and may be a good tool to use in studies related to LBP in the Arabic-speaking world. The Modern Standard Arabic version of RMDQ was well understood and easy to answer by native Arabic-speaking patients with chronic LBP in the clinical setting. The construction of the questionnaire was preserved, and the 24 items were maintained in a fashion similar to the original and other versions of the questionnaire.

The Cronbach's alpha of 0.948 is a good measure of internal consistency of the Modern Standard Arabic version of the RMDQ, and is in accordance with other translated versions, 0.81 [8], 0.837 [9], 0.904 [13], 0.85 [14], 0.96 [15], 0.94 [16], 0.826 [19]. Positive correlation in the analysis for convergent validity was observed between both the RMDQ and FFL and VAS. Although pain does not necessarily cause limitation in activities, a low association would be accepted between pain and functional disability. Also, including only patients with more than 3 months of pain duration could have contributed to the lower correlation value. Studies that included mixed acute and chronic LBP patients reported higher correlations between the RMDQ and the VAS [9,17]. Some association with the spinal mobility measure may also be expected, although previous work is controversial regarding the existence of such association [12-14,16].

It is necessary to establish the psychometric properties of any newly adapted tool. The cultural adaptation of the RMDQ for the Modern Standard Arabic language has produced a tool with high levels of reliability similar to that reported for other versions. Moroccan and Tunisian versions [15,16] are part of the Arabic language, but are considered mutually unintelligible both written and orally, constituting a sociolinguistic variation different than the Modern Standard Arabic understood by the majority of Arabic-speaking countries. Although the authors of these two versions reported that they are easy to understand for Arabic speakers in the Middle East and Gulf countries, further examination of these versions by the authors of the present study yielded unintelligible for countries other than people of the Maghreb. Modern Standard Arabic, also called Literary Arabic is currently the only official form of Arabic, used in most written documents as well as in official spoken occasions. It is the official language of 26 states and the liturgical language of Islam. Modern Standard Arabic largely follows the grammatical standards of Quranic Arabic and uses much of the same vocabulary [20].

The lack of a reliable LBP functional disability tool understood by our local Arabic-speaking patients represents an obstacle to measure its impact on their perceived level of functionality. Also, the translated version of the RMDQ enables clinicians and researchers to assess and compare the clinical outcomes of different interventions for LBP.

Limitations of this study include the relative small sample size. Also, convergent validity was assessed only against pain intensity and spinal mobility that was found to have a low correlation. We recommend that future studies measure its association with other measures, such as the Physical Functioning subscales of the Short-Form (36) Health Survey (SF-36) or other scores measuring physical function. In addition, the responsiveness of the Modern Standard Arabic RMDQ needs to be studied in different spinal pathologies. Conclusion

The findings of this study indicate that the Modern Standard Arabic version of the RMDQ is an easy to understand, reliable clinical tool for the measurement of the functional disability caused by LBP among native Arabic-speaking patients.

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