

# TRANSLATION, CROSS CULTURAL ADAPTATION AND VALIDATION OF ROLAND MORRIS LOW BACK PAIN TOOL IN LEBANON

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## Abstract

**Background:** The Roland-Morris questionnaire is one of the most widely used questionnaires, which have been designed for back pain. It has been shown to yield reliable measurements valid for inferring the level of disability in low back pain patients. The aim of this study is to validate the Roland-Morris questionnaire in patients with low back pain after translation and adaptation to the Lebanese population.

**Methods:** The questionnaire was translated from English to Arabic and back translated using two separate Lebanese translators with English as their mother tongue. The questionnaire was applied on 122 patients with low back pain and then analyzed for reliability and validity.

**Results:** Patients' mean age was 61.43±17.22. Cronbach's alpha, which was used to assess the internal consistency of the questionnaire, measured 0.778. Pearson correlation between the RMQ and NRS was  $r=0.407$ ,  $p<0.0001$ . A three factors exploratory factor analysis was done. There was a high and significant correlation between the questions related to physical activity and NRS.

**Conclusion:** The Lebanese version of the RMQ is a reliable and valid tool for the evaluation of low back pain.

**Keywords:** Low back pain, Arabic version, Roland Morris questionnaire, reliability, validity

## Introduction

Low back pain constitutes an important public health problem<sup>1</sup> with an estimated worldwide one month prevalence of 30.8%.<sup>2</sup>

A recent study, among Lebanese workers, have shown that the prevalence of LBP ranged around 45%.<sup>3</sup> Female workers had higher incidence of LBP due to their complex daily life activities and this was also demonstrated in other studies.<sup>4,5</sup> such as natural menopausal transition, physical strain to the lower back, and psychosocial and lifestyle stress, for low back pain (LBP)

Back pain is defined as pain extending from the bottom of the rib cage to the gluteal sulcus. The etiology for back pain could be secondary to a musculoskeletal disorder, spine injury, disc related, or a medical disease affecting the spine.<sup>6</sup> The type and intensity of back pain varies among individuals and its severity depends greatly on the underlying etiology.

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LBP stands as an obstacle against performing daily life activities and is associated with high financial burden i.e loss of days of work, medical expenses.<sup>7</sup>

It is very important to have a tool that evaluates the severity of low back pain in a reliable, easy and feasible approach, and its effect on daily activities of the individual.

The Roland Morris questionnaire<sup>8</sup> is a common instrument used in the assessment of patients with low back pain that has been translated and validated in several countries. It is also an efficient tool that is used to evaluate the efficacy of medical or interventional treatment protocols. Although RMQ questionnaire was translated and validated in Saudi Arabia, the difference in culture and dialect have prompted us to translate and validate the questionnaire to Lebanon. The objective of this study is to translate and validate the Lebanese version of the RMQ.

## Materials and Methods

The Roland Morris questionnaire was translated by two different translators, with one of them aware of the study while the other served as a control. Cultural sensitivity was tested through an expert panel consisting of 2 pain physicians, a nurse and a spine surgeon. A single version was selected after an anesthesiologist (practicing pain specialty) and the two translators had agreed on. Then, a back translation of this final version was done by two translators whose mother tongue language is English. The Arabic version was used throughout the study without any modification.

One-hundred twenty two patients were included in this study. The patients were screened through the outpatient Pain Center or from in-patient consultations at the American University Medical Center. The inclusion criteria included Lebanese nationals, older than eighteen years admitted for chronic low back pain due to any etiology.

Most of the patients were receiving a pharmacological treatment such as Non-steroid anti-inflammatory drug, Opioid, Paracetamol and/or Gabapentin/Pregabalin medications. Oral informed consent was obtained from all the patients before the administration of the questionnaire. Verbal analogue

scale (VAS) was used to measure the pain intensity after the questionnaire had been administered and the score was recorded.

The RMQ consists of 24 items, where a total score of 0 indicates no disability and a score of 24 implies severe disability.<sup>8</sup> It includes questions related to daily life functions and common physical activities.

Descriptive statistics were summarized by presenting the number and percentage for categorical variables and the mean  $\pm$  standard deviation (SD) for continuous ones. The correlation between two continuous variables (RMQ and NRS) was assessed by using Pearson correlation coefficient. An exploratory factor analysis (EFA) was conducted to evaluate the factor structure of the 24 items. Factors were extracted by the principal component method, and a Varimax (orthogonal) method of rotation was applied to the results. Cronbach's alpha was measured to assess the reliability (internal consistency) of a set of items. P-value  $< 0.05$  was used to indicate statistical significance. All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS, version 24).

## Results:

One-hundred twenty two patients with low back pain were included in this study, with average weight 61.43 kg, with a predominance of females to males ratio. Hypertension was the prevalent comorbidity in these patients. Participants' demographics and baseline characteristics are present in Table 1. Descriptive information of the RMQ is present in Table 2. Data are presented as frequencies and percentages of positively answered questions. The most common pain medication consumed by the patients was paracetamol, which was followed by NSAIDs, opioids and Gabapentin/Pregabalin. There was no predominance in drug combinations over one another.

The internal consistency, measured with Cronbach's alpha, was 0.778.

Two factor EFA was eliminated because it dropped out several items, while the three factor EFA retained most of the items and had a Cronbach's Alpha of 0.71 and 0.72 for the first two factors (Table 3). The

Table 1  
Sample Demographics

	Total N=122
<b>Gender</b>	
Male	47 (38.5)
Female	75 (61.5)
Age	61.43 ± 17.22
Weight	75.08 ± 13.18
BMI	26.93 ± 4.44
Medical history	
HTN	53 (44.2)
DM	17 (14.8)
CAD	7 (6.1)
Dyslipidemia	15 (13.0)
Osteoporosis	1 (0.9)
Medications	
Gabapentin/Pregabalin	37 (34.3)
Paracetamol	71 (61.2)
NSAID	58 (52.7)
Opioid	38 (36.9)

first factor consisted of 10 questions that included Q8, Q9, Q11, Q16, Q19, Q1, Q6, Q3, Q5, and Q24. The highest loading factor 0.6 was retained by Q8 “Because of back, I try to get other people to do things for me”. The second factor included Q17, Q10, Q2, Q12, Q20, Q21, and Q23 with a load factor ranged between 0.45 and 0.77. The highest rank was in Q17 “I only walk short distances because of my back pain” with a load factor of 0.776. The third factor included Q7, Q13, and Q14 with a load factor ranged from 0.46 to 0.58.

Pearson correlation of the EFA with the NRS demonstrated that pain score significantly associated with the three factors constructs. The highest correlation was shown to be with factor 2. This factor comprises the following questions: 2, 10, 12, 17, 20, 21, and 23.

Questions in factor 1 and questions in factor 2 showed a Cronbach’s alpha of 0.71 and 0.72 respectively. The linear relation between the questionnaire and NRS was measured. The RMQ mean of the entire sample was 16.75 ± 4.25, and the NRS mean was 2.54 ± 0.55 on a scale of 0-10. The Pearson correlation between RMQ and NRS was  $r=0.41$ ,  $p<0.0001$ . Correlation between each factor and NRS was also assessed; the

Table 2  
Descriptive of the RMQ

	Total N=122
<b>Total score</b>	69.77 ± 17.69
<b>Q1</b>	74 (60.7)
<b>Q2</b>	97 (79.5)
<b>Q3</b>	110 (90.2)
<b>Q4</b>	98 (80.3)
<b>Q5</b>	88 (72.1)
<b>Q6</b>	90 (73.8)
<b>Q7</b>	90 (73.8)
<b>Q8</b>	86 (70.5)
<b>Q9</b>	86 (70.5)
<b>Q10</b>	96 (78.7)
<b>Q11</b>	98 (80.3)
<b>Q12</b>	93 (76.2)
<b>Q13</b>	79 (64.8)
<b>Q14</b>	89 (73.0)
<b>Q15</b>	52 (42.6)
<b>Q16</b>	90 (73.8)
<b>Q17</b>	91 (74.6)
<b>Q18</b>	84 (68.9)
<b>Q19</b>	29 (23.8)
<b>Q20</b>	72 (59.0)
<b>Q21</b>	104 (85.2)
<b>Q22</b>	93 (76.2)
<b>Q23</b>	101 (82.8)
<b>Q24</b>	52 (42.6)

highest and most significant correlation appeared to be between NRS and the second factor ( $\alpha=0.56$ ,  $p<0.0001$ ).

**Discussion**

Several tools were established to evaluate low back pain and are easy accessible. The RMQ is an established tool used to evaluate low back pain. It is one of commonly and widely used questionnaires to assess disability in low back pain patients. Several

Table 3 Exploratory Factor Analysis Load Factors and internal reliability measures of RMQ

	Factors			Alpha coefficient
	1	2	3	Cronbach's Alpha
<b>First factor</b>				
Q8	0.602			0.71
Q9	0.593			
Q11	0.582			
Q16	0.534			
Q19	0.477			
Q1	0.463			
Q6	0.441			
Q3	0.440			
Q5	0.406			
Q24	0.396			
<b>Second factor</b>				
Q17		0.776		0.72
Q10		0.699		
Q2		0.584		
Q12		0.504		
Q20		0.501		
Q21		0.498		
Q23		0.451		
<b>Third factor</b>				
Q7			0.582	0.37
Q13			0.510	
Q14			0.460	

studies illustrated that RMQ was reliable and valid.<sup>9-18</sup>culturally adapted questionnaire. OBJECTIVE: Argentinean Roland-Morris Disability Questionnaire (RMDQ)

In this study, we translated and validated this questionnaire in Lebanese patients with LBP. The questionnaire, answered by yes/no, was short, easy to administer and understand. Most of the patients required assistance in filling the questionnaire but some of them were able to fill it solely. There were no difficult sentences needed to be changed for its clarity

after piloting.

According to the descriptive of our questionnaire, Questions 15, 19, and 24 are the least representable. These three questions cover three aspects, the appetite, dependence, and prolonged bed rest.

The internal consistency of our questionnaire version was found to be acceptable with a Cronbach's alpha coefficient of 0.78, similar to the Spanish<sup>18</sup> (0.83) and Gujarati<sup>19</sup> validity, sensitivity and specificity of the Gujarati version of the RMDQ for use in Non Specific Chronic low back pain. STUDY DESIGN: A

reliability, validity, sensitivity and specificity study of Gujarati version of the Roland-Morris Disability Questionnaire (RMDQ (0.75) versions, lower than the Columbian<sup>12</sup> but a validated version is not available in our country. Methods. The RMQ 24-item scale ranges from 0 (no disability (0.86), Chinese<sup>11</sup> (0.87), Korean<sup>15</sup> (0.89), and Argentinian<sup>9</sup> (0.9).

The Pearson correlation between RMQ and pain score is rated as moderate ( $r=0.41$ ) with a highly significant correlation ( $p<0.001$ ). Based on the literature review, our result was found to be similar to the Columbian<sup>12</sup> but a validated version is not available in our country. Methods. The RMQ 24-item scale ranges from 0 (no disability ( $r=0.43$ ), Japanese<sup>20</sup> ( $r=0.44$ ), and Korean<sup>15</sup> (0.45) versions, lower than the Argentinian ( $r=0.5$ )<sup>9</sup>, Chinese (0.68) and Hungarian<sup>21</sup> ( $r=0.61$ ) versions, but higher than the Moroccan<sup>14</sup> ( $r=0.32$ ) and Spanish<sup>18</sup> ( $r=0.35$ ) versions.

We believe that RMQ is a multi-dimensional tool, therefore it was interesting to check which factor would highly correlate with the patients' pain scores. Factor 2, describing physical activity performance, was

associated with the highest correlation with pain score. Therefore, we can tell that the questionnaire reflects the relation between the intensity of pain through the NRS and its effect on physical activity. Moreover, this questionnaire could function as a tool to evaluate the treatment modalities in such patients.

In conclusion, our study showed that the Lebanese version is suitable, well received, and easy to use. Thus, it is reliable and valid to assess disability in low back pain in the Lebanese population.

Limitations in this study included: lack of measurement of repeatability and sensitivity due to limitations in time and resources; bias might have been introduced since a research member was assisting some patients in filling the questionnaire.

Conflicts of Interest: None.

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