

Translation, Cross Cultural Adaptation and Validation of an Arabic Version of Short Form-2-McGill Pain Questionnaire (SF-MPQ-2)

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Abstract

Objectives: The aim of our study is to evaluate the psychometric properties of the Lebanese Arabic version of the short form 2 of McGill pain questionnaire in patients complaining of low-back pain.

Methods: 170 patients (>18 years) diagnosed with low back pain and treated by our pain service at the American University of Beirut Medical Center completed the McGill pain questionnaire. Patient demographic data was collected. The duration of pain symptoms was obtained, home medications list was reviewed, and the number of pain medications taken was recorded and divided into five categories.

Results: The mean age was 58.7 ± 17 years. The average low back pain score reported was 6 ± 1.1 (median 6.00 [5.00-6.00]) on a 0 to 10 NRS scale. The majority of the patients included have lumbar disk disease (64.5%). Internal consistency was 0.821 for the total 22 descriptors. Pearson's r coefficient compared to NRS average pain score was 0.24, $p < 0.001$. Factor analysis showed that the descriptors loaded on two factors. The alpha coefficient was 0.862 and 0.765 for factor 1 and factor 2, respectively. Loadings of the first factor ranged between 0.5 and 0.8, which retained 12 descriptors, and the second factor between 0.45 and 0.8, which retained six descriptors.

Discussion: The translated Lebanese Arabic version of the SF-MPQ-2 is a reliable and valid for low-back pain assessment with adequate cultural sensitivity.

Keywords: Pain; Short-form McGill Pain Questionnaire; Lebanese version; Pain assessment

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Introduction

Pain is a complex, dynamic, and subjective sensation described according to its quality, location, intensity and emotional impact with the intensity being recognized as the primary clinical dimension.¹and success in its treatment requires accurate assessment. Thus, assessment tools that are practical, culturally sensitive, and psychometrically sound are needed. Objectives: The purpose of this study was to evaluate the psychometric properties and cultural sensitivity of the Arabic Brief Pain Inventory (BPI

In 1968, Melzack and Casey² suggested that there are three major psychological dimensions of pain: “sensory-discriminative, affective-motivation and cognitive-evaluative”. These three dimensions are very well described by Borsook et al.³ and they correlate with several anatomical regions in the brain, interact all together and finally modulate the normal pain perception; starting from peripheral stimulus transmitted through the spinal cord and finally reaching the brain.³ These categories interact with one another to provide quantitative and qualitative information and multidimensional evaluation of the components of pain.^{2,4-7} The sensory-discriminative dimension tackles the underlying pathophysiology along with its neural pathways; on the other hand, the affective-motivation dimension involves the psychophysiological interplay of pain sensation; and the cognitive-evaluative dimension reflects the patient’s evaluation and personal experience with pain.²

The simple descriptive scale (SDS), visual analogue scale (VAS) and numerical rating scale (NRS) are well validated tools to rate the pain intensity in terms of sensory quality, however

they did not take into consideration the different pain aspects or dimensions such as the psychological dimensions stemming from and combining with pain and the different types of pain. Therefore, it does not evaluate and capture the pain as a whole entity.^{6,8-10}

In 1975, Melzack originally developed the McGill pain questionnaire [MPQ-1], consisting of 78 descriptors^{5,11}, in an attempt to better evaluate and describe the pain¹¹ while incorporating other scales used previously.^{12,13} The original questionnaire development consisted of two parts. In the first part, subjects were asked to classify pain using clinical words and the second part, the patient was asked to rate the pain intensity.^{4,11} A short form-1 (SF-MPQ-1) was developed later by Melzack, included 15 pain descriptors, but did not incorporate the neuropathic type of pain.¹¹ Later on, there was a need for a short form-2 (SF-MPQ-2) that was developed by Dworkin in 2009 and included 7 additional neuropathic pain descriptors (total of 22 descriptors).¹⁴

Throughout the years, pain assessment has been of increasing importance for both patients and healthcare providers, illustrating its essential role in the quality of life and consequently considered as the fifth vital sign. Recent studies identify inadequate pain assessment as the primary source of pain mismanagement, resulting in high incidence of impaired functional status.¹⁵ The prevalence of low back pain in Lebanese workers was found to be around 45%.¹⁶ Proper pain assessment means listening to what the patient is reporting, and a reliable questionnaire that truthfully reflects what the patient is feeling. The MPQ facilitated the communication between the patients and healthcare pro-

fessionals.⁶ Several versions had been validated around the world.^{4,6,7,17-21} adjectives whose mean ratings differed markedly from those in the original MPQ were resubmitted, along with 3-4 synonyms to a third group (n = 40

One big disadvantage of MPQ is its strong linguistic tie and connotations specific to socio-cultural context.^{5,17} The Arab world consists of 21 countries and is a home for more than 400 million Arabic-speaking people. Consequently, an Arabic version had to be created.

The Arabic translation of the SF-MPQ-1 was first done in the Kingdom of Saudi Arabia (KSA), consisting of 15 descriptors.²² Since the spoken Arabic dialect in KSA is different from that in Lebanon, we have decided to validate a Lebanese Arabic version of the SF-MPQ-2.^{7,14} The SF-MPQ2 is an easily administered questionnaire, consisting of 22 descriptors which take into consideration 7 new descriptors relevant to the neuropathic pain and a 0 to 10 numeric scale for each descriptor,^{12,13,23} in order to better understand and evaluate the pain so that we can treat it in the best possible way.

The aim of this study is to evaluate the psychometric properties of the Lebanese Arabic version of the SF-MPQ2 in patients complaining of low-back pain.

The questions to be answered were the following:

- 1- Is the Lebanese Arabic version of SF-MPQ2 culturally sensitive to the low-back pain population?
- 2- Is the Lebanese Arabic version of SF-MPQ2 internally consistent in a Lebanese low-back pain patient sample?
- 3- Can the Lebanese Arabic version of SF-MPQ2 be validated with its 3 dimensions (sen-

sory, affective and evaluative) in the Lebanese low-back pain patient population?

Materials and Methods

Population and setting

After the approval of the institutional board review, and over a period of 18 months, a convenience sample of 170 patients diagnosed with low back pain were enrolled in the study. The inclusion criteria included any adult (>18 years) in patients treated by our pain service at the American University of Beirut Medical Center (AUBMC) including those admitted to the hospital or seen at the outpatient clinics. Patients who were very ill and/or refused to fill the questionnaire were excluded from the study.

Instrument

The SF-MPQ-2 is a widely used pain assessment tool that is easy to administer which evaluates the different pain aspects (neuropathic and non-neuropathic pain). It is a modified version of the SF-MPQ-1 (total of 15 pain descriptors), developed by Dworkin in 2009, with an additional seven neuropathic pain descriptors (total of 22 pain descriptors). It takes into consideration as well the sensory, evaluative, and the affective components with 4 sub-scales (Please refer to Table 1).²⁴ Patients were asked to rate their pain on an 11-point scale [0-10], with "0" refers to having no pain at all and "10" being the worst pain they ever had. The scoring of the questionnaire was done by averaging the total score of the 22 different pain descriptors, with higher scores indicating higher intensity of

pain. In addition, they were asked to give an average pain score during the past 24 – 48 hours using the NRS.

Table 1: SF-MPQ-2 subscales and corresponding pain descriptors (Adopted from Dworkin 2015. SF-MPQ-2, Short Form McGill Pain Questionnaire 2)

| Category of pain | Sensory | | | Affective |
|------------------|-----------------|-------------------|------------------------------|-------------------|
| Subscale | Continuous pain | Intermittent pain | Neuropathic pain | Affective |
| Pain descriptors | Throbbing | Shooting | Hot-burning | Tiring-exhausting |
| | Cramping | Stabbing | Cold-freezing | Sickening |
| | Gnawing | Sharp | Pain caused by light touch | Fearful |
| | Aching | Splitting | Itching | Punishing-cruel |
| | Heavy pain | Electric-shock | Tingling or pins and needles | |
| | Tender | Piercing | Numbness | |

Process

For the purposes of this study, it was conducted in two steps: the first step included translation of the original McGill pain questionnaire, and the second included data collection from the recruited patients. Translating the original English version was done by two different translators in Lebanon with different backgrounds (the first was aware of the process while the second was not) into T1 and T2 versions (Arabic versions). Then, an anesthesiologist practicing pain specialty and the two translators agreed upon one single updated version of the translated questionnaire. Thereafter, a bilingual translator, who was not part of the research team and was not aware of the concept explored, back translated the Arabic version into English. The original McGill English version was compared to the back-translated English version, with no differences detected. An expert committee (a pain physician, a pain nurse, and a volunteer) achieved cross-cultural equivalence, consolidated all the versions of the questionnaire and developed the pre-final version for field-testing.

Once cultural equivalence had been established, the questionnaire was administered to 10 patients

complaining of low back pain at the pain clinic. Pain was also monitored using other quantitative and qualitative pain monitoring tools. Upon admission and before being treated by pharmacologic/interventional measures, one of the research team members visited patients in their rooms/clinic and introduced them to the study. After obtaining verbal consent, the patients were handled the questionnaire to fill and point out weak points, assess clarity, ambiguity, and the aim of each question. Patients' feedback was collected, and the questionnaire was adjusted by the research team accordingly. No modifications were performed after completing the above process.

For the second phase of the study (data collection), eligible patients were approached by a research team member and were offered to participate in the study. After obtaining their verbal consent, the patients answered the questions and rated their pain. Meanwhile, the research team member was filling out the questionnaire. Patients who refused to participate in the study were informed that this will not affect the outcome of their clinical care in any possible way. Patient demographic data was collected. The duration of pain symptoms was obtained and further classified as either acute (<3 months) or chronic (≥ 3 months). The patients home medications list was reviewed, and the number of pain medications taken was recorded and divided into five categories (i.e. Paracetamol, Opioids, NSAIDS, SNRI, and Gabapentin/Pregabalin).

Statistical analysis

A convenience sample of 170 patients (of which

152 patients analyzed) complaining of low back pain who were evaluated at the in-patient unit or the outpatient clinics at the AUBMC were recruited for this study. This sample size was deemed to be sufficient to provide basic descriptive statistics and bivariate correlations.²⁵ After reviewing the number of patients presenting to AUBMC and making sure that our sample size can be recruited, we have decided to recruit the above-mentioned number of patients. Furthermore, taking into consideration the "rule of 100", where the number of subjects should be at least five times larger than the number of items (22 descriptors) included in the questionnaire,^{26,27} the analyzed number of patients (152 patients) was enough (>110 patients) to perform the reliability and factor analysis. Demographics and clinical characteristics were presented as mean \pm SD or n (%). Internal consistency was assessed by calculating Cronbach's alpha coefficient. Convergent validity was tested using Pearson's correlation between the questionnaire total score and NRS score. An exploratory factor analysis (EFA) was conducted to evaluate the factor structure of the 22 items. Factors were extracted by the principal axis factoring, and a Varimax method of rotation was applied to the results. P-value < 0.05 was used to indicate statistical significance. All statistical analyses were performed using the Statistical Package for Social Sciences (IBM SPSS Statistics 26).

Results

Descriptive statistics

A total of 170 patients were recruited initially, however 18 patients were excluded from the

analysis mainly due to: refusal to complete the questionnaire or missing information (>3 descriptors). Most of the patients enrolled in this study were females (55%), and the mean age was 58.7 ± 17 years. The average low back pain score reported was 6 ± 1.1 (median 6.00 [5.00-6.00]) on a 0 to 10 NRS scale. As for the pain symptoms duration, 24.3% had acute pain (duration of symptoms <3 months), 75.7% had chronic pain (duration of symptoms ≥ 3 month), and 83.6% complaining of radicular back pain. The majority of the patients included had lumbar disk disease (64.5%), followed by sacroiliitis (11.2%) and cancer (5.9%), the rest included back pain due to spinal stenosis, herpes infection, among others.

Cultural sensitivity

The committee reviewed the final questionnaire version and pointed out some minor linguistic modifications, which were addressed and changed accordingly. No changes were done after piloting the study.

Reliability and validity

Internal consistency was assessed using the

Cronbach's alpha coefficient, which was 0.821 for the total 22 descriptors of the Lebanese Arabic SF-MPQ-2 version, which is evaluated as good.

To insure the reliability and validity of our obtained results, one or two items were eliminated and Cronbach's alpha was recalculated. Cronbach's alpha was not significantly affected by the deletion of any of the questionnaire items. It is important to note that several patients were excluded from the analysis when three or more questionnaire items were not answered by the patient.

In a subgroup analysis of the most common diagnosis (lumbar disk and sacroiliitis), Cronbach's alpha was calculated for the questionnaire's subscales (continuous pain, intermittent pain, neuropathic pain, and affective pain), which ranged between 0.6 and 0.8.

Descriptive data of this analysis is presented in Table 2. Convergent validity was established by comparing the questionnaire total score with the NRS average pain score.

The resultant Pearson's r coefficient value was 0.24, which was statistically significant ($p < 0.001$).

Table 2: Descriptive Statistics and Internal Consistency Reliability for SF-MPQ-2 subscale scores and total score in the subgroup including lumbar disk and sacroiliitis

| | Number of items (n=115) | Mean \pm SD | Median | IQR | Cronbach's α |
|------------------------------|----------------------------|---------------|--------|---------|---------------------|
| SF-MPQ-2 Continuous | 6 | 5.1 \pm 1.9 | 4.7 | [4 – 7] | 0.59 |
| SF-MPQ-2 Intermittent | 6 | 5.3 \pm 1.9 | 5.3 | [4 – 7] | 0.54 |
| SF-MPQ-2 Neuropathic | 6 | 4.2 \pm 1.7 | 4 | [3 – 5] | 0.68 |
| SF-MPQ-2 Affective | 4 | 3.3 \pm 2.7 | 2.3 | [2 – 5] | 0.77 |
| SF-MPQ-2 Total | 22 | 4.6 \pm 1.7 | 4.3 | [3 – 6] | 0.87 |

Exploratory factor analysis was performed with a Varimax rotation. The total variance explained as well as the scree plot were used to determine the number of underlying factors in our population. The factors were also verified by comparing our output (total variance explained) with a web-based parallel analysis engine.²⁸ The results of this factor analysis showed that the descriptors loaded on two factors (Table 3). The alpha coefficient was 0.862 and 0.765 for factor 1 and factor 2, respectively. Loadings of the first factor ranged between 0.5 and 0.8, which retained 12 descriptors, and the second factor between 0.45 and 0.8, which retained six descriptors.

Pain descriptors that loaded the most on factor 1, in decreasing order, were: Q14 (fearful), Q13 (sickening), Q15 (punishing-cruel) followed by Q10 (tender), Q8 (aching pain), Q18 (piercing) and lastly Q19 (pain caused by light touch), Q3 (stabbing pain), Q20 (itching), Q17 (cold freezing), Q11 (splitting pain), Q6 (Gnawing pain).

Pain Descriptors that loaded the most on factor 2, in decreasing order, were: Q22 (numbness), Q21 (Tingling or pins and needles), Q16 (electric shock pain), Q1 (throbbing pain), followed by Q9 (heavy pain), Q7 (hot-burning pain).

Discussion

Low back pain has a big impact on daily life activities and consequently increases the medical costs and work absenteeism.²⁹

Low back pain is a common complaint worldwide—up to 31% prevalence.³⁰ and recently the prevalence has been estimated to be around 45% among the Lebanese workers¹⁶ and was found to be more pronounced in females.^{31,32} such as natural menopausal transition, physical strain to the lower back, and psychosocial and lifestyle stress, for low back pain (LBP)

The Cronbach's alpha value obtained of 0.821 reflects the reliability of our translated Lebanese Arabic version of the SF-MPQ-2, which stands out among other validated versions done in different languages (English and Japanese) where the alpha coefficient ranged from 0.7 to 0.9.^{24,33} natural history, pathophysiologic mechanisms, and treatment response. Previous research has demonstrated its reliability, validity, and responsiveness in diverse samples of patients with chronic pain. However, the SF-MPQ-2 has not been evaluated for use in patients with acute pain.

Data were examined from a double-blind, randomized clinical trial of immediate-release tapentadol versus immediate-release oxycodone in patients with acute low back and associated radicular leg pain (N = 666)

Convergent validity was established by correlating the total pain score of the SF-MPQ-2 with NRS pain score, and it was found to be $r = 0.24$ with statistical significance ($p\text{-value} < 0.001$). The obtained correlation coefficient r was found to be comparable to that obtained in the two other translated SF-MPQ-2 versions, the American and the Japanese versions ($r = 0.2\text{-}0.5$).^{24,33} natural history, pathophysiologic mechanisms, and treatment response. Previous research has demonstrated its reliability, validity, and responsiveness in diverse samples of patients with chronic pain. However, the SF-MPQ-2 has not been evaluated for use in patients with acute pain. Data were examined from a double-blind, randomized clinical trial of immediate-release tapentadol versus immediate-release oxycodone in

Table 3: Exploratory factor analysis for the Lebanese Arabic SF-MPQ-2

| Questionnaire items | Factor 1 | Factor 2 |
|--|----------|----------|
| Q1: Throbbing pain الم نابض و خافق | - | 0.684 |
| Q2: Shooting pain الم مفاجئ و شديد | - | - |
| Q3: Stabbing pain الم كطعن بالسكين | 0.575 | - |
| Q4: Sharp pain الم حاد | - | - |
| Q5: Cramping pain الم مع تشنج | - | - |
| Q6: Gnawing pain الم موجع، غير مريح | 0.508 | - |
| Q7: Hot-burning pain الم كالحرقان | - | 0.456 |
| Q8: Aching pain الم مؤلم | 0.666 | - |
| Q9: Heavy pain وجع مع ثقل | - | 0.591 |
| Q10: Tender يؤلم بشدة عند الضغط | 0.691 | - |
| Q11: Splitting pain وجع ممزق | 0.565 | - |
| Q12: Tiring-exhausting متعب و منهك | - | - |
| Q13: Sickening دوار. لعيان. الم | 0.751 | - |
| Q14: Fearful وجع مرعب | 0.793 | - |
| Q15: Punishing-cruel وجع كأنه عقاب قاسي | 0.718 | - |
| Q16: Electric shock pain وجع صدمة كهربائية | - | 0.712 |
| Q17: Cold freezing متلج/بارد | 0.533 | - |
| Q18: Piercing الم ثاقب | 0.618 | - |
| Q19: Pain caused by light touch الم عند المس | 0.582 | - |
| Q20: Itching الم مع حك | 0.568 | - |
| Q21: Tingling or "pins and needles" وخز مثل الابر | - | 0.739 |
| Q22: Numbness تنميل | - | 0.770 |

patients with acute low back and associated radicular leg pain (N = 666

EFA showed that pain descriptors loaded mainly on two factors: Factor 1 included both the sensory (continuous, intermittent, and neuropathic pain) and affective components with the latter exhibiting the main contribution to this factor; Factor 2 included only the sensory component with neuropathic pain having the main contribution.

The diversity in the diagnosis might have contributed to the sub-optimal value of the correlation coefficient and the loading of pain descriptors on a lower number on factors on the scree plot (two instead of 4 factors), due to dilution of the patients symptomatology which in turn affected the scoring system. The review of the literature has obtained a higher number of underlying factors due to the uniform patient population with a specific pain complaint and a single diagnosis (i.e. cancer, joint pain, neuropathic vs non-neuropathic pain), which resulted in higher correlation coefficients $r^{6,10,19,34}$. Melzack and Casey suggested that there are three major psychological dimensions of pain: sensory, affect, evaluative. These categories interact with one another to provide quantitative and qualitative information on the components of pain. In 1975, Melzack developed the McGill Pain Questionnaire, which is composed of four major parts and evaluates the qualities of pain. The aim of this study was to assess the applicability, reliability, and validity of the McGill Pain Questionnaire on a sample of Greek cancer patients receiving palliative treatment. It was administered to 114 cancer patients before the initiation of the palliative treatment, and then to 80 cancer patients during the treatment 7 days later. The results indicated that scale reliability was very good (0.95-0.97

Terkawi et al.²² was the first to translate Arabic version of the SF-MPQ-1. The SF-MPQ-1 cannot be used as a control to compare with our

study. Several other versions of the validated SF-MPQ-1 exist which includes only 15 pain descriptors, as opposed to the SF-MPQ-2 version that was developed by Dworkin in 2009 where he added another 7 pain descriptors.¹⁴

Our findings indicate that the SF-MPQ-2 is an easy to administer, reliable, and a valid pain assessment tool. It is a first step in a multimodal approach to tackle the pain from different angles.

Some limitations are associated with our study: First, the Arab world is a home for 22 countries. The dialect varies among these countries and between different regions of the same country (Modern Standard Arabic vs. Vernacular Arabic).

Patients were approached using the vernacular Arabic that they use in their daily life communication.

The questionnaire was written using the classical Arabic. The classical Arabic words have many adjectives and synonyms and patients may not know all of them.

Second, the educational level was not documented during the interview with patient and this might have affected the ability of the patient to perceive and respond to the questionnaire in a proper way.

Conclusion

Our study has shown that the translated Lebanese Arabic version of the SF-MPQ-2 is a reliable and valid for low-back pain assessment with adequate cultural sensitivity. Thus, we recommend using it by the medical community in Lebanon.

Conflict of Interest: None.

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