Validity and Reliability of Arabic Version of McGill Pain Questionnaire to Assess Pain after Liver Resection

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Abstract

Background: Liver resection is a common surgery associated with post-operative pain. So, it is necessary to measure pain post liver resection.

Purpose: The purpose of this study was to test the face validity, the content validity, the internal consistency reliability and the test retest reliability of Arabic-language version of short form of McGill pain questionnaire (SF-MPQ) to measure the pain level in post liver resection patients.

Subjects and Methods: One expert panel (consists of ten experts) and 60 patients with post liver resection pain, 120 data collection sheets (including retest sheets) were filled out in this study. Forward translation, development of preliminary initially translated version, backward translation, development of the pre-final version and testing of pre-final version using experts then testing of the final version on patients was done. Clarity index, index of content validity, descriptive statistics, Cronbach’s coefficient alpha and Spearman’s rank correlation coefficients were used for statistical analysis.

Results: The study showed that scale index of clarity equals 100% and scale level clarity index universal agreement (UA) equals 100%. In addition, scale index of content validity (S-CVI) equals 100%, S-CVI/UA equals 100%, Cronbach’s alpha equals 0.931 and all Spearman’s rank correlation coefficients between test and retest results were statistically significant.

Conclusion: The Arabic-language version of the SF-MPQ has face and content validity, internal consistency and test retest reliability enough to measure pain after liver resection operations.

Key Words: Validity – Reliability-short form of McGill pain questionnaire – Liver resection.
instrument, make literal translation of the question-naire items besides taking cultural considerations into account for good understanding of the content by the native citizens of the country [6].

From the advantages of cross-cultural adapta-tion, procedures are strengthening the reliability of instruments, comparison of the results of the same study between different countries with different languages [7]. As psychometric properties of an instrument may be variable from time to time, from culture to another and from context to another [8].

In physical therapy, valid and reliable tools are used for assessment of improvement in patient condition and assessment of specific therapy effect. Valid tool must have good face, content, criterion and construct validity and all are connected together; face validity is defined as the degree to which test respondents view the content of a test and its items as relevant to the context in which the test is being administered [9].

The purpose of this study was to test the face validity, the content validity, the internal consistency reliability and the test retest reliability of Arabic-language version of SF-MPQ to measure the pain level in post liver resection patients.

**Material and Methods**

**Place of study:** The study was conducted in intensive care unit (ICU) of National Liver Institute (NLI) Menoufya University.

**Type of study:** A prospective observational study.

**Time of study:** It was done between 10/2015 until 3/2016.

An agreement to do this research on the hospital was conducted after obtaining the official agreement and ethical committee approval.

**Subjects (Selection of patients):**

Sixty patients underwent liver resection were involved in this study. All participants signed consent form before starting.

The subjects were eligible in this study if their age range from 30 to 60 years’ old, able to understand verbal commands and able to read and write in Arabic.

The participants were excluded if they had a Major psychological disorder, history of epilepsy and patients with polyneuropathy.

**Material:**

**Assessment scale:**

Short form of the McGill Pain Questionnaire (SF-MPQ) had been developed. The main component of the SF-MPQ consists of 15 descriptors (11 sensory; 4 affective) which were rated on an intensity scale as 0=none, 1=mild, 2=moderate or 3=severe. Three pain scores were derived from the sum of the intensity rank values of the words chosen for sensory, affective and total descriptors. The SF-MPQ also includes the Present Pain Intensity (PPI) index of the standard MPQ and a visual analogue scale (VAS). The SF-MPQ scores obtained from patient’s post-surgery were be compared to the scores obtained with the standard MPQ. Then correlations were be done to indicate case improve-ment [3].

**Methods:**

The short form of McGill pain questionnaire was translated and adapted into Arabic language following the process postulated by [10]. The following steps were followed:

1. Forward translation: Translation of the original scale into Arabic (forward translation or one-way translation).

   - Scale in English (Appendix I) was translated to Arabic to produce two forward-translated versions of the scale (A1 and A2) (Appendix II&III).

   - Two translators participated in forward translation, their mother language were Arabic, but they had distinct backgrounds.
   - One translator was knowledgeable about health terminology and the content area of the construct of the tool in the Arabic.
   - The other translator was knowledgeable about the cultural and linguistic nuances of the Arabic.

2. Development of the preliminary initial translated Arabic version (Appendix IV). Both versions (A1 and A2) were compared and merged by the researchers and research committee of basic science for physical therapy, Faculty of Physical Therapy was asked for help in resolving ambiguities and discrepancies.

3. Blind back-translation (Blind backward translation or blind double translation) of the preliminary initial translated version of the scale:
- The preliminary initial translated version of the scale was translated to English to produce two back-translated versions (B1 and B2) (Appendix V&VI).

- Two translators participated in back translation, but they had distinct backgrounds.
  - One translator was knowledgeable about health terminology and the content area of the construct of the tool in the English.
  - The other translator was knowledgeable about the cultural and linguistic nuances of the English.

4- Comparison of the two back-translated versions of the scale (B 1 and B2).

The researchers compared back-translation of the scale B1 with B2, and also compared both B1 and B2 with the original English scale regarding instructions, items, response format, wording, sentence structure, meaning and relevance, and they found that there were no significant differences between them, so the preliminary initial translated Arabic version was considered to be the pre-final Arabic version of the scale.

5- Pilot testing of the pre-final Arabic version of the scale for face and content validity.

- The expert panel (ten experts) were asked to evaluate each item of the tool for clarity (face validity) and provide suggestions to improve its clarity; dichotomous questions (clear/unclear) were used regarding instruction, items and response words.

- Then the expert panel were asked to evaluate each item of the modified pre-final Arabic version of the scale for content equivalence (content-related validity) using the following scale: 1=not relevant; 2=unable to assess relevance; 3=relevant but needs minor alteration; 4=very relevant and succinct and give suggestions to improve its relevance (1 and 2 considered not relevant, 3 and 4 considered relevant).

- After the modified pre-final version passes expert face and content validity tests, it was named the final version.

6- Pilot test of the final Arabic version of the scale was conducted on post liver resection patients: Patients filled out data collection sheets which was used to collect demographic data (name, age, sex, weight, height, body mass index (BMI), and short form of McGill pain questionnaire.

7- Sheets were refilled out again in the same day.

Data collection and statistical analysis:

Data collection:

All patients’ data were entered as they wrote as follow:

- Missing data (any data in the sheet except answers) were left blank if cannot obtained by telephone, missing answers were left blank and when patient marked two answers or made unclear mark it was considered as blank.

Statistical analysis:

SPSS computer program (version 22) was used for data analysis taking in consideration that: Ratio, Proportion, Clarity index, Expert proportion of clearance, Index of content validity (CVI), Expert proportion of relevance, Descriptive statistics, Cronbach’s coefficient alpha and Spearman’s rank Correlation coefficient [11,12].

Results

I- Experts results:

- Clarity index for the final version:

  The scale index of clarity equaled 100% and scale-level clarity index universal agreement equal 100% (Table 1).

- Relevance index for final version:

  The mean of proportion of relevance of the final version (clear responses) equaled 100% and item index of content validity (I-CVI) equaled 100% as shown in (Table 1).

II- Patients results:

- Descriptive statistics:

  Table (2) showed that 34 males (56.6%) and 26 females (43.3%) participated in this study. The age distribution showed that mean equaled 44.2 and ranged from 34-57 years.

- Internal consistency reliability:

  Table (3) showed Cronbach’s alpha equals 0.913. This means that the Arabic version of SF-MPQ has good internal consistency and good test retest reliability.

- Test retest reliability:

  Spearman’s rank correlation coefficient ranged from 0.7 to 0.9 in 5 items and between 0.6 and 0.7 (item no 6) while the rest of items were above 0.9.
Discussion

The Arabic version of SF-MPQ had excellent face validity as scale index of clarity equals 100%, scale-level clarity index UA equals 100% and the mean of proportion of clearance (clear responses) equals 100%, also it had excellent content validity as S-CVI equals 100%, SCVI/UA equals 100% and the mean of the proportion of relevance (relevant responses) equals 100%. The results of the current study came in agreement with Polite and Beck [15] who stated that a scale to be judged as having excellent content validity, it would be composed of items with item indexes of content validity (I-CVI) that meet the following criteria (I-CVI of 1.00 with three to five experts and a minimum I-CVI of 0.78 for 6 to 10 experts) and it would have S-CVI of 0.90 or higher. The recommended standards might necessitate two rounds of expert review if the initial assessment suggests the need for substantial item improvements. In addition, this came in agreement with Waltz [14] who stated that scale-level content validity index, averaging calculation method (S-CVI/Ave) of 0.90 or above is the minimum acceptable index and items that do not achieve the minimum acceptable indices are revised and re-evaluated.

Internal consistency and test retest reliability of the Arabic version of MPQ.

The Arabic version of SF-MPQ had good internal consistency and good test retest reliability as Cronbach’s alpha equals 0.913. So according to George and Mallery [15] a above 0.9 was referred as excellent internal consistency, also Spearman’s rank correlation coefficient between 0.7 and 0.9 (as in item 2,3,4,5,14) was referred as good test retest reliability and correlation between 0.6 and 0.7 (as in item 6) was considered fair while correlations of the rest of items is considered excellent as it was above 0.9. Also these results come in agreement with similar results obtained by Kachooei [15] who conducted a study to adapt the MPQ to the Persian language and to evaluate the psychometric properties of the Persian version of the SF-MPQ. Persian SF-MPQ-2 showed excellent reliability and good to excellent internal consistency throughout the questionnaire. It is a valid and reliable instrument for measuring the pain intensity and applicable in pain assessment [16]. The results of the current study also strengthened by Dworkin RH [17] who conducted a study to assess the reliability and clinically meaningful thresholds of MPQ when the SF-MPQ was examined for reliability and responsiveness to change, the study indicated mostly satisfactory test-retest reliability and responsiveness values of the Norwegian SF-MPQ (NSF-MPQ), but showed that the measurement properties vary between different groups of patients with pain (Rheumatic and musculoskeletal). The validity, reliability, and subscale structure of the revised SF-MPQ, termed the SF-MPQ-2, were examined from the responses of patients with a range of diverse chronic pain syndromes (N=882), and painful diabetic neuropathy (N=226). The data suggest that the SF-MPQ-2 had excellent validity and reliability [17]. A project to translate, adapt and validate an instrument for cross-cultural research might take several years; and it was normally conducted using more than one study to adhere to the recommended methodological approaches described above. One study might set as its initial goal to translate, adapt and cross-validate a research instrument using translation steps and pilot testing of the pre-final version of the instrument in the target language with a monolingual sample: Cognitive debriefing. In a second study, the researchers might set a single goal to establish the preliminary psychometrics of the translated instrument with bilingual participants. Then, in a third study, the researchers’ goal might be to establish the initial full psychometric properties of a translated instrument in a sample of the target population of interest [10].

The final version is considered the base for the next research that will be conducted to establish the full psychometric properties of Arabic language version of SF-MPQ.

References

Appendix (I)
Original English Score

SHORT-FORM MCGILL PAIN QUESTIONNAIRE
RONALD MELZACK

<table>
<thead>
<tr>
<th>PATIENTS NAME</th>
<th>DATE</th>
</tr>
</thead>
</table>

<table>
<thead>
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<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>SHOOTING</td>
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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>STABBING</td>
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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>SHARP</td>
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<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>CRAMPING</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>GNAWING</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ACHING</td>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
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<tr>
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<td>3</td>
</tr>
<tr>
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<td>2</td>
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</tr>
<tr>
<td>SICKENING</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
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<td>2</td>
<td>3</td>
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Appendix (II)
Arabic ver.

الصيغة الموجزة مكعبيل لاستبان الألم
رونالد ميلزاك

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<tr>
<th>اسم المريض:</th>
<th>التاريخ:</th>
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</thead>
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<tr>
<th>لا يوجد</th>
<th>خفيف</th>
<th>متوسط</th>
<th>ممتع</th>
<th>أسوأ</th>
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PPI

<table>
<thead>
<tr>
<th>NO PAIN</th>
<th>WORST POSSIBLE PAIN</th>
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</table>

<table>
<thead>
<tr>
<th>0</th>
<th>NO PAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MILD</td>
</tr>
<tr>
<td>2</td>
<td>DISCOMFORTING</td>
</tr>
<tr>
<td>3</td>
<td>DISTRESSING</td>
</tr>
<tr>
<td>4</td>
<td>HORRIBLE</td>
</tr>
<tr>
<td>5</td>
<td>EXCRUCIATING</td>
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Appendex (III)

Lexikon
Certified Translation Services
Member of Egyptian Translation Association
Accredition No. 13214

CERTIFIED TRANSLATION FROM THE ENGLISH LANGUAGE

We hereby confirm that the above translation is in full conformity with the original document presented to us in the English language.
Shebin Al Kom, 30.09.2015
File No.: 301/15

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Email: info@lexikon4trans.com, Website: www.lexikon4trans.com

Appendex (IV)

Preliminary Initial Translated Version
A.15/1;clty5V

We hereby confirm that the above translation is in full conformity with the original document presented to us in the English language.
Shebin Al Kom, 30.09.2015
File No.: 301/15
### Appendix (V)
**Backward Translation 1**

Summary formula for the pain Questionnaire (MC Gill)
Ronald Milzak

<table>
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<th>Patient Name / Date</th>
<th>Patient Name / Date</th>
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<tr>
<td>No Found</td>
<td>Low</td>
</tr>
<tr>
<td>Pulsating pain</td>
<td>0)</td>
</tr>
<tr>
<td>Megaligia</td>
<td>0)</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>0)</td>
</tr>
<tr>
<td>Sharp</td>
<td>0)</td>
</tr>
<tr>
<td>Cramping</td>
<td>0)</td>
</tr>
<tr>
<td>Nibbling</td>
<td>0)</td>
</tr>
<tr>
<td>Hot Burning</td>
<td>0)</td>
</tr>
<tr>
<td>Aching</td>
<td>0)</td>
</tr>
<tr>
<td>Heavy</td>
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</tr>
<tr>
<td>Thin</td>
<td>0)</td>
</tr>
<tr>
<td>Fatigue</td>
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</tr>
<tr>
<td>Nausea</td>
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</tr>
<tr>
<td>Sickness</td>
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<td>Fear</td>
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### Appendix (VI)
**Backward Translation 2**

Summary formula McGill pain Questionnaire
Ronald Milzak

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<th>Patient Name / Date</th>
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</thead>
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<td>Worst possible</td>
</tr>
<tr>
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<td>No Pain Found</td>
</tr>
<tr>
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<td>Low</td>
</tr>
<tr>
<td>2</td>
<td>Disturbing</td>
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</tr>
<tr>
<td>4</td>
<td>Frightening</td>
</tr>
<tr>
<td>5</td>
<td>Tormenting</td>
</tr>
</tbody>
</table>

---

No Pain | The worst possible pain
---|---
0 | None |
1 | Light |
2 | Discomforting |
3 | Painful |
4 | Erthingen |
5 | Painful |