Translation and cultural adaptation of the Brief Michigan Hand Questionnaire to Brazilian Portuguese language

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Abstract

Purpose The use of patient-reported outcome questionnaires is recommended in orthopedic studies. However, validated tools are necessary to ensure the comparability of results across different studies, centers, and countries. The Brief Michigan Hand Questionnaire (BMHQ) can be used for outcome measures in self-evaluation after carpal tunnel release. This study aimed to translate the BMHQ to Portuguese to permit cross-cultural adaptation to Brazilians patients.

Methods We translated the Brief Michigan Hand Questionnaire from the original version (English) to Brazilian Portuguese. The translation and cultural adaptation of the content of this tool consisted of six stages, according to the methodology proposed by medical literature: (1) initial translation of the questionnaire by two independent translators; (2) synthesis of translations and reconciliation; (3) back-translation to English of the reconciled version; (4) verification of the cultural equivalence process by an expert committee; (5) pre-testing in a sample of patients to verify understanding of the items; and (6) development of a final version of the BMHQ.

Results The pre-final version of the tool was applied to 43 patients to verify its understanding. Pre-testing showed that the questions and options were satisfactorily understood. The number of items from the original English version was maintained in the Brazilian Portuguese version of BMHQ.

Discussion The Brazilian Portuguese version of the BMHQ is easily understood by patients and will be useful to clinicians and researchers.

Introduction

The Michigan Hand Questionnaire was developed based on strict psychometric testing and has been validated extensively in field studies in the United States and in another countries [4, 5]. To develop a brief version of the Michigan Hand Questionnaire, the authors used data gathered prospectively from patients with four distinct hand conditions, including distal radius fractures, carpal tunnel syndrome, rheumatoid arthritis, and thumb carpometacarpal arthritis [13]. The Brief Michigan Hand Questionnaire (BMHQ) has some advantages over the original questionnaire. The BMHQ is more time efficient, reduces responder burden, minimizes missing data, has psychometric properties similar to those of the original questionnaire, and demonstrates excellent reliability and validity.

For all questionnaires developed in English-speaking countries, researchers must also consider immigrant non-English speaking populations. Moreover, the number of multinational and multicultural research projects has increased in the last years. The term "cross-cultural adaptation" is used to encompass a process that examines language (translation) and cultural adaptation issues in the process of preparing a questionnaire for use in another setting [1].

The Brazilian Portuguese version of the Michigan Hand Outcome Questionnaire has been developed [12]. The

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objectives of the present study were to translate the BMHQ into Brazilian Portuguese and perform cross-cultural adaptation for Brazilian patients.

Material and methods

This study was performed at the University Hospital where we work and was approved by the Ethics in Research Committee Board. All patients provided written informed consent prior to participation. The copyright holder of the original BMHQ authorized the study.

The Brief MHQ contains 12 items with responses of a score of 1 (minimum score=poorest functioning) to 5 (maximum score=ideal functioning) regarding several aspects of hand function. Respondents needed to answer every question to calculate the BMHQ summary score. Eight of the items (questions 1, 2, 3, 4, 8, 9, 11, and 12) are reversed in the following way: 1=5, 2=4, 4=2, and 5=1. The 12 raw scores are then added to give a maximum score of 60 and a minimum score of 12. After averaging the items, the average score was then normalized to generate a score that was scaled from 0 (poorest function) to 100 (ideal function). The normalization is calculated using the formula: $100 \times ($Brief MHQ raw score$-1)/4$. For example, raw score of 60 yields an average score of 5. The value will be $(5-1)/4 \times 100=100$. Higher scores indicate better overall functioning and satisfaction (University of Michigan, http://sitemaker.umich.edu/mhq/brief_mhq). The BMHQ does not distinguish between hands.

Translation and cross-cultural adaptation of the original English version of the BMHQ were performed according to the recommendations of Beaton et al. [1]. First, translation into Brazilian Portuguese was performed independently by two Brazilian Portuguese native-speaking hand surgeons, producing two different Portuguese versions of the questionnaire (T1 and T2, respectively). The two translations were then compared, and a version combining both initial translations (T12) was written.

To allow verification of consistencies between the original English version and the T12 version of the questionnaire, two non-doctor translators totally blinded to the original version and whose native language is English translated the questionnaire back into the original language, producing the BT1 and BT2 documents. A committee of specialists consisting of the translators, four hand surgeons, and two physiotherapists revised the final version to account for discrepancies and finalized the Brazilian–Portuguese version of the BMHQ.

The pre-test version was applied by the authors to 43 patients with carpal tunnel syndrome to evaluate the understanding of the translated questionnaire by the target population. The target population was asked how much they understood each item. The completed questionnaires were evaluated to determine the presence of missing responses.

Finally, the questionnaire was revised item by item, and the final version of the Brazilian Portuguese BMHQ was created.

Results

Of the 43 adults in this study, 86 % were women. In terms of educational levels, 47 % answered "less than high school graduate" and 35 % answered "high school graduate". For economic status, 60 % reported to have a yearly family income of less than 10,000 USD and 35 % reported annual incomes in the range of 10,000–19,999 USD.

No difficulties were encountered during the process of translating the questionnaire to its Brazilian Portuguese version. Translated versions T1 and T2 were similar to each other, and their language and culture-specific peculiarities were solved by consensus, simplifying the development of the T12 version. The back-translations (BT1 and BT2) showed no major deviations from the original version, which demonstrated the accuracy of the initial translation.

During the cultural equivalence pre-testing, the questions and options were satisfactorily understood by all 43 participants. Consequently, the Brazilian Portuguese language version of the BMHQ did not require additional modifications in the number of items of the original English version (Table 1).

Discussion

The existence of appropriately translated instruments is important for the conduct of international multicenter studies. The lack of equivalence limits the comparability of responses across populations divided by language or by culture [1].

Carpal tunnel syndrome is one of the most common upper-extremity disorders [7].

The Boston Carpal Tunnel Questionnaire (BCTQ) is a well-recognized, validated, and disease-specific outcome assessment tool for carpal tunnel syndrome [8]. The BCTQ has two scales, the Symptom Severity Scale and the Functional Status Scale. The Symptom Severity Scale consists of 11 questions with multiple-choice responses. The Functional Status Scale includes eight items for assessing hand function during common daily activities [3]. The BCTQ was translated, and cultural equivalence and validation were performed for Brazilian Portuguese [2]. BCTQ has been used in Brazil for measurement of outcome after surgical treatment of carpal tunnel syndrome [9]. During application of the BCTQ, some difficulty in understanding frequently appears, and this is

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Table 1 The original BMHQ in English language and the Brazilian Portuguese language version of the BMHQ after translation and cultural adaptation

English	Portuguese
Instructions: This survey asks you for your views about your hands and your health. This information will help keep track of how you feel and how well you are able to do your usual activities.	Instruções: Essa pesquisa solicita sua opinião sobre a sua saúde e suas mãos. Essas informações vão ajudar a acompanhar como você se sente e o quanto é capaz de fazer suas atividades diárias.
Answer EVERY question by marking the answer as indicated.	Responda TODAS as questões marcando apenas uma resposta.
If you are unsure about how to answer a question, please give it the best answer you can. Please answer every question, even if you do not experience problems with the hand or wrist. Some questions may ask you about your ability to complete certain tasks. If you do not do a certain task, please estimate the difficulty with which you would have in performing it. Questions pertaining to work include occupational work, housework, and school work. Please circle one answer for each question.	Se você não tem certeza sobre como responder uma questão, por favor, tente responder da melhor maneira possível. Responda todas as questões, mesmo que você não tenha problemas nas mãos ou punhos. Algumas questões perguntam sobre sua capacidade para completar certas tarefas. Se você não realiza alguma dessas tarefas, por favor, imagine a dificuldade que você teria ao fazê-la. As perguntas sobre o funcionamento da sua mão incluem o trabalho profissional, doméstico e escolar. Por favor, marque uma resposta para cada pergunta.

1. Overall, how well did your hand(s) work during the past week?

Very good	Good	Fair	Poor	Very poor
1	2	3	4	5

1) No geral, como foi o funcionamento da(s) sua(s) mão(s) na última semana?

Muito bom	Bom	Regular	Ruim	Muito ruim
1	2	3	4	5

2. How was the sensation (feeling) in your hand(s) during the past week?

Very good	Good	Fair	Poor	Very poor
1	2	3	4	5

2) Qual foi a sensibilidade de sua(s) mão(s) na última semana?

Muito bom	Bom	Regular	Ruim	Muito ruim
1	2	3	4	5

3. How difficult was it for you to hold a frying pan during the last week?

Not at all difficult	A little difficult	Somewhat difficult	Moderately difficult	Very difficult
1	2	3	4	5

3) Qual foi o grau de dificuldade que você teve para segurar uma frigideira na última semana?

Nada difícil	Um Pouco	Razoavelmente difícil	Moderadamente	Muito difícil
1	2	3	4	5

4. How difficult was it for you to button a shirt or blouse during the past week?

Not at all difficult	A little difficult	Somewhat difficult	Moderately	Very difficult
1	2	3	4	5

4) Qual o grau de dificuldade você teve para abotoar uma camisa ou blusa na última semana?

Nada difícil	Um Pouco difícil	Razoavelmente difícil	Moderadamente difícil	Muito difícil
1	2	3	4	5

5. In the past 4 weeks, how often were you unable to do your work because of problems with your hand(s)/wrist(s)?

Always	Often	Sometimes	Rarely	Never
1	2	3	4	5

5) Nas últimas 4 semanas, com que frequência você não pôde trabalhar por causa de problemas com sua(s) mão(s) ou seu(s) punho(s)?

Sempre	Frequentemente	Às vezes	Raramente	Nunca
1	2	3	4	5

6. In the past 4 weeks, how often did you take longer to do tasks in your work because of problems with your hand(s)/wrist(s)?

Always	Often	Sometimes	Rarely	Never
1	2	3	4	5

6) Nas últimas 4 semanas, com que frequência você demorou mais do que o normal para realizar tarefas por causa de problemas com a(s) mão(s) ou punho(s)?

Sempre	Frequentemente	Às vezes	Raramente	Nunca
1	2	3	4	5

7. How often did the pain in your hand(s)/wrist(s) interfere with your daily activities (such as eating or bathing) in the past week?

Always	Often	Sometimes	Rarely	Never
1	2	3	4	5

7) Com que frequência a dor na(s) mão(s) ou punho(s) interferiu em suas atividades diárias (como comer ou tomar banho) na última semana?

Sempre	Frequentemente	Às vezes	Raramente	Nunca
1	2	3	4	5

8. Describe the pain in your hand(s)/wrist(s) in the past week?

Very Mild	Mild	Moderate	Severe	Very Severe
1	2	3	4	5

8) Descreva o grau de dor em sua(s) mão(s) / seu(s) punho(s), na última semana?

Muito fraca	Fraca	Moderada	Intensa	Muito intensa
1	2	3	4	5

Table 1 (continued)

English

9. I am satisfied with the look of my hand(s).

Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

10. In the past week, the appearance of my hand(s) interferes with my normal daily activities.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

1. In the past week, how satisfied are you with the motion of your fingers?

Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
1	2	3	4	5

1. In the past week, how satisfied are you with the motion of your wrist?

Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very dissatisfied
1	2	3	4	5

Respondents must answer every question in order to calculate the Brief MHQ summary score. For 1, 2, 3, 4, 8,9, 11 and 12 items, the responses must be reversed in the following way: 1=5, 2=4, 4=2, 5=1

Raw score range will have a minimum score [1] to maximum score [5]

After averaging the items, the raw score is then normalized to generate a score that is scaled from 0 (poorest function) to 100 (ideal function).

Normalization=100×(Brief MHQ raw score−1)/4

Portuguese

9) Eu estou satisfeito (a) com a aparência de minha(s) mão(s)

Concordo plenamente	Concordo	Não concordo nem discordo	Discordo	Discordo plenamente
1	2	3	4	5

10) Na última semana, a aparência de minha(s) mão(s) interferiu em minhas atividades diárias habituais.

Concordo plenamente	Concordo	Não concordo nem discordo	Discordo	Discordo plenamente
1	2	3	4	5

11) Na última semana, você ficou satisfeito(a) com o movimento de seus dedos?

Muito satisfeito	Satisfeito	Nem satisfeito nem insatisfeito	Insatisfeito	Muito insatisfeito
1	2	3	4	5

12) Na última semana, você ficou satisfeito(a) com o movimento de seu(s) punho(s)?

Muito satisfeito	Satisfeito	Nem satisfeito nem insatisfeito	Insatisfeito	Muito insatisfeito
1	2	3	4	5

Para o cálculo da pontuação final, todas as perguntas precisam ser respondidas. As perguntas 1, 2, 3, 4, 8, 9, 11 e 12 devem ter os escores revertidos da seguinte maneira: 1=5, 2=4, 4=2, 5=1

A pontuação bruta será obtida pela soma total de pontos, dividida pelo número de perguntas [12]. A pontuação mínima será 1 e a máxima será 5. A pontuação bruta é então normatizada para gerar a pontuação final, que varia de 0 (função prejudicada) a 100 (função ideal).

Normatização=100×(pontuação bruta do BMHQ−1)/4

solved by transforming the self-applied questionnaire into an instrument administered by interview. The process of transforming a self-applied questionnaire on application by interview has also been documented for other questionnaires translated into Brazilian Portuguese [6]. Orfale et al. [11] and Oku et al. [10] justify the interview to avoid the exclusion of patients by insufficient education or those with vision impairment.

To avoid this process of performing an interview, we examined the medical literature for a short questionnaire. We solved this issue by performing cross-cultural validation of the BMHQ to the Brazilian Portuguese language.

Previous studies showed that a shortened version of the Michigan Hand Questionnaire is a more attractive research instrument for population studies because it is more time-efficient, reduces responder burden, and can therefore minimize missing data. The Brazilian Portuguese version of the BMHQ was obtained in patients who mostly had low educational levels. During the process of cultural adaptation, we observed that patients included in this study didn't have difficulties to comprehend the questionnaire. Of the 12 original items, nothing was modified because they focused on situations with which most Brazilians are familiar.

The process of translation and cultural adaptation of the BMHQ was successfully performed and resulted in the Brazilian Portuguese version. We believe that the short version of the questionnaire favors the use in patients with low level of education.

The Michigan Hand Questionnaire was developed based on strict psychometric testing. It has been validated extensively in field studies in the United States and around the world. We believe that this instrument will be reliable and valid to use in Brazil.

References

1. Beaton DE, Bombardier C, Guillemin F, et al. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine. 2000;25:3186–91.
2. Campos CC, Manzano GM, Andrade LB, et al. Translation and validation of an instrument for evaluation of severity of symptoms and the functional status in carpal tunnel syndrome. Arq Neuro-Psiquiatr. 2003;61:51–5.
3. Chatterjee JS, Price PE. Comparative responsiveness of the Michigan Hand Outcomes Questionnaire and the Carpal Tunnel Questionnaire after carpal tunnel release. J Hand Surg Am. 2009;34:273–80.
4. Chung KC, Pillsbury MS, Walters MR, et al. Reliability and validity testing of the Michigan Hand Outcomes Questionnaire. J Hand Surg Am. 1998;23:575–87.
5. Chung KC, Hamill JB, Walters MR, et al. The Michigan Hand Outcomes Questionnaire (MHQ): assessment of responsiveness to clinical change. Ann Plast Surg. 1999;42:619–22.
6. Ciconelli RM, Ferraz MR, Santos W, et al. Translation to the Portuguese language and validation of the generic questionnaire for the quality of life SF-36 (Brasil SF-36). Rev Bras Reumatol. 1999;39:143–50.
7. Fernandes CH, Meirelles LM, Raduan Neto J, et al. Carpal tunnel syndrome with thenar atrophy: evaluation of the pinch and grip strength in patients undergoing surgical treatment. Hand. 2013;8:60–3.
8. Levine DW, Simmons BP, Koris MJ, et al. A self-administered questionnaire for the assessment of severity of symptoms and functional status in carpal tunnel syndrome. J Bone Joint Surg Am. 1993;75:1585–92.
9. Meirelles LM, Santos JBG, Santos LL, et al. Evaluation of the Boston questionnaire applied at late post-operative period of carpal tunnel syndrome operated with the Paine retinaculotome through palmar port. Acta Ortop Bras. 2006;14:126–32.
10. Oku EC, Andrade AP, Stadiniky SP, et al. Translation and cultural adaptation of the Modify-University of California at Los Angeles Shoulder Rating Scale to Portuguese language. Rev Bras Reumatol. 2006;46:246–52.
11. Orfale AG, Araújo PMP, Ferraz MB, et al. Translation into Brazilian Portuguese, cultural adaptation and evaluation of the reliability of The Disabilities of the Arm, Shoulder and Hand questionnaire. Braz J Med Biol Res. 2005;38:293–302.
12. Pinho N, Rafael A, Cardoso A, et al. Translation and cross-cultural adaptation of the Michigan Hand Outcomes Questionnaire. J Bras Psiquiatr. 2011;60:99–110.
13. Waljee JF, Kim HM, Burns BP, et al. Development of a Brief, 12-item version of the Michigan Hand Questionnaire. Plast Reconstr Surg. 2011;128:208–20.