SOCIEDADE BRASILEIRA DE ORTOPEDIA E TRAUMATOLOGIA

RBO REVISTA BRASILEIRA DE ORTOPEDIA

www.rbo.org.br

Original Article

The Brazilian version of the Constant–Murley Score (CMS-BR): convergent and construct validity, internal consistency, and unidimensionality☆

Rodrigo Py Gonçalves Barreto[a,*], *Marcus Levi Lopes Barbosa*[b], *Marcos Alencar Abaide Balbinotti*[c], *Fernando Carlos Mothes*[d], *Luís Henrique Telles da Rosa*[a], *Marcelo Faria Silva*[a]

[a] *Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA), Programa de Pós-Graduação em Ciências da Reabilitação, Porto Alegre, RS, Brazil*

[b] *Universidade FEEVALE, Novo Hamburgo, RS, Brazil*

[c] *Quebec University at Trois-Rivières, Trois-Rivières, Canada*

[d] *Irmandade Santa Casa de Misericórdia de Porto Alegre (ISCMPA), Grupo de Cirurgia do Ombro, Porto Alegre, RS, Brazil*

ARTICLE INFO

Article history:
Received 26 September 2015
Accepted 10 November 2015
Available online 26 May 2016

Keywords:
Clinimetrics
Assessment
Factor analysis
Validity
Shoulder

ABSTRACT

Objectives: To translate and culturally adapt the CMS and assess the validity of the Brazilian version (CMS-BR).

Methods: The translation was carried out according to the back-translation method by four independent translators. The produced versions were synthesized through extensive analysis and by consensus of an expert committee, reaching a final version used for the cultural adaptation. A field test was conducted with 30 subjects in order to obtain semantic considerations. For the psychometric analyzes, the sample was increased to 110 participants who answered two instruments: CMS-BR and the Disabilities of the Arm, shoulder and Hand (DASH). The CMS-BR and DASH score range from 0 to 100 points. For the first, higher points reflect better function and for the latter, the inverse is true. The validity was verified by Pearson's correlation test, the unidimensionality by factorial analysis, and the internal consistency by Cronbach's alpha.

Results: The explained variance was 60.28% with factor loadings ranging from 0.60 to 0.91. The CMS-BR exhibited strong negative correlation with the DASH score (−0.82, $p < 0.05$), Cronbach's alpha 0.85, and its total score was strongly correlated with the patient's range of motion (0.93, $p < 0.001$).

Conclusion: The CMS was satisfactorily adapted for Brazilian Portuguese and demonstrated evidence of validity that allows its use in this population.

☆ This study was performed at Universidade Federal de Ciências da Saúde de Porto Alegre (UFSCPA), Porto Alegre, RS, Brazil.

* *Corresponding author*.
E-mail: rodrigopyy@gmail.com (R.P.G. Barreto).

http://dx.doi.org/10.1016/j.rboe.2016.08.017

Versão brasileira do Constant-Murley Score (CMS-BR): validade convergente e de constructo, consistência interna e unidimensionalidade

Palavras-chave:
Clinimetria
Avaliação
Análise fatorial
Validade
Ombro

RESUMO

Objetivos: Traduzir e adaptar culturalmente o Constant-Murley Score (CMS) e verificar a validade da versão brasileira (CMS-BR).

Métodos: A tradução foi feita de acordo com o método de retrotradução por quatro tradutores independentes. As versões produzidas foram sintetizadas por análise extensiva e consenso de um comitê de especialistas e geraram uma versão final usada para a adaptação cultural. Fez-se um teste em campo com 30 sujeitos para observação de possíveis considerações em relação à semântica. Para a posterior análise psicométrica, ampliou-se a amostra para 110 participantes que responderam a dois instrumentos: CMS-BR e Disabilities of the Arm, Shoulder and Hand (DASH). O CMS-BR e o DASH variam de 0 a 100 pontos. Para o primeiro, altas pontuações refletem melhor função, para o segundo, o contrário. A validade foi verificada com o teste de correlação de Pearson, a unidimensionalidade com a análise fatorial e a consistência interna com o Alfa de Cronbach.

Resultados: A variância explicada foi de 60,28% com cargas fatoriais entre 0,60 e 0,91. O CMS-BR demonstrou correlação forte e negativa com o DASH (-0,82, $p < 0,05$), com o alfa de Cronbach de 0,85 e seu escore total teve correlação forte com a amplitude de movimento dos pacientes (0,93, $p < 0,001$).

Conclusão: O CMS-BR foi adaptado de forma satisfatória e demonstrou evidências de validade que permitem seu uso nessa população.

Introduction

Shoulder pain accounts for an expressive prevalence in consultations with a general practitioner or orthopedic surgeons.[1,2] These patients often present various complaints, like mobility deficits and pain,[3] which directly affect upper limb function. In order to perform an as comprehensive clinical assessment as possible is recommended that patient be assessed with instruments that allow inferences about function. The function is a construct, a latent variable that cannot be directly observed. Therefore, the utilization of functional scores is the adequate option to measure it.[4,5]

There are about 34 scores for shoulder function assessment but the Constant–Murley score (CMS), originally published in the English language, is one of the most used.[4,6,7] The CMS is a non-specific score that covers different domains of shoulder function (pain, activities of daily living, range of motion and power) being higher scores indicative of better function.[6–8] This instrument is a compound score containing four subscales: three self-reported subscales and one shoulder elevation strength subscale which is performed by an external assessor.[8] The nomenclature of the "power" subscale contained in the original version of the CMS was posteriorly changed to "strength", as well as the test position was changed to elevation in scapular plane.[9]

The appropriate use of an instrument of evaluation implies the correct verification of its validity.[10,11] The evidence of validity characterize the relationship among items of the score and between items and total score. It also indicates the extent in which the instrument explains the construct under assessment. This process ensures an adequate representation of the construct measured by the functional score.[12,13]

Psychometric properties of the original version of the CMS such as reliability, floor and ceiling effects, convergent and criterion validity have been verified. Despite the comprehensive investigation of the validity of the score, its dimensional structure was investigated before the adaptation of the strength subscale and the factor analysis evinced that the score was not unidimensional.[14] These aforementioned features could affect the interpretation of measurement of the construct.[5,12,15]

The use of an instrument of evaluation in another culture or language must be preceded by an appropriate process of translation and cultural adaptation. Furthermore, evidence of validity must be properly verified in the adapted version. Currently, a translated and adapted version of CMS is available only for the Danish[16,17] language. There is no version of CMS in the Brazilian Portuguese language. Therefore, the aim of this study was translate, culturally adapt and verify the convergent and construct validity, internal consistency and dimensional structure of the adapted version.

Methods

The process of translation was performed according the back-translation method[10,11] and following the COSMIN checklist for ensure the methodological quality of the psychometric analysis.[18]

The recommendations published by Constant et al.[9] were followed, excepting for the branding and model of the