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## Original article

# Translation and validation of Neck Bournemouth Questionnaire to Brazilian Portuguese



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### ABSTRACT

**Objective:** To translate the Neck Bournemouth Questionnaire to Brazilian Portuguese, cross-culturally adapt, and to verify its validity and its reliability.

**Methods:** The development of the Brazilian version of Neck Bournemouth Questionnaire (Brazil-NBQ) was based on the guideline proposed by Guillemin. The applied process consisted of translation, back-translation, committee review and pre-test. Sixty-one volunteers presenting neck pain participated in this study. Thirty-five of them participated during pre-testing phase to verify the instrument comprehension, and the remaining 26 took part during psychometric analysis. Psychometric evaluation included interrater and intrarater reliability and construct validity (correlation among Brazil-NBQ, SF-36, Numerical rating score and Neck Disability Index).

**Results:** Some terms and expressions were changed to obtain cultural equivalence for Brazil-NBQ during the translation phase. The NBQ showed an intrarater ICC of 0.96 and interrater ICC of 0.87. Construct validity analysis showed moderate correlations with SF-36 and strong correlation with Numerical rating score and Neck Disability Index.

**Conclusion:** Neck Bournemouth Questionnaire was translated and culturally adapted to Portuguese language, and it demonstrated to be valid and reliable to evaluate patients' neck pain.

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### Tradução e validação do Neck Bournemouth Questionnaire para o português do Brasil

### RESUMO

**Objetivo:** Traduzir o Neck Bournemouth Questionnaire para o português do Brasil, adaptá-lo culturalmente e verificar a sua validade e confiabilidade.

**Métodos:** O desenvolvimento da versão brasileira do Neck Bournemouth Questionnaire (NBQ-Brasil) foi baseado nas diretrizes propostas por Guillemin. O processo aplicado consistiu em tradução, retrotradução, revisão por um comitê e pré-teste. Participaram deste estudo 61

#### Palavras-chave:

Tradução

Questionário

Cervical

Avaliação de desfecho

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voluntários que apresentavam dor cervical; 35 deles participaram durante a fase de pré-teste para verificar a compreensão do instrumento e os 26 restantes durante a análise psicométrica. A avaliação psicométrica incluiu a análise da confiabilidade interavaliadores e intra-avaliador e da validade do construto (correlação entre o NBQ-Brasil, o SF-36, a Escala Numérica de Dor e o Neck Disability Index).

**Resultados:** Alguns termos e algumas expressões foram alterados para se obter equivalência cultural com o NBQ-Brasil durante a fase de tradução. O NBQ mostrou uma CCI intra-avaliador de 0,96 e CCI interavaliadores de 0,87. A análise da validade do construto mostrou correlações moderadas com o SF-36 e correlação forte com a Escala Numérica de dor e o Neck Disability Index.

**Conclusão:** O Neck Bournemouth Questionnaire foi traduzido e adaptado culturalmente para o idioma português e demonstrou ser válido e confiável para avaliar a dor cervical dos pacientes.

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## Introduction

Pathologies that cause neck pain are frequently treated by health professionals and they are found in 22–70% of the population showing higher predominance in older people. Around 30% of the patients presenting chronic symptoms, which means symptoms lasting longer than six months, and about 5% of the symptomatic patients become incapable of working leading to work faults and higher treatment costs.<sup>1-3</sup>

A wide analysis of the disease requires standardized tools that measure patient conditions with precision and quality to follow the clinic progression and to verify treatment efficacy and quality of life related to self-perspective of health. Among measurement tools, questionnaires and functional scales are important for clinical practice and scientific research due to their subjective information that measure in an efficient and trustful manner with low cost.<sup>4-6</sup>

Questionnaires created in other languages must be translated and culturally adapted to the environment in which they will be used. Later, psychometric properties of the questionnaire must be evaluated to ensure this tool possesses exactly the same characteristics, validity and reliability of the original version.<sup>7</sup>

Complex and subjective nature of neck pain comprises more than just a response to a nociceptive stimulus to a tissue lesion, but also a multidimensional experience described by the biopsychosocial model that includes pain, disability, cognitive and affective domains.<sup>4,8</sup>

Neck Bournemouth questionnaire (NBQ) was created by Bolton and Humphreys<sup>4</sup> due to the necessity of an evaluation measure to various health domains, such as pain, function, incapacity and psychological and social aspects of patients with neck pathologies. This tool is easily applied, reproducible and responsive to clinical alterations, which makes it adequate to be used for scientific research and clinical practice to monitor the pathology progression and to assist treatment planning.<sup>9-11</sup> Original version of this tool is written in English, however, it has been translated, culturally adapted and largely used as an evaluation tool in several studies and in different countries such as Germany, Denmark, Netherlands and France.<sup>8,12-14</sup> However, this questionnaire had not been

translated to Portuguese and, in order to be used in Brazil, it is necessary to be translated and culturally adapted.

In this context, the aim of the present study is to translate and culturally adapt Neck Bournemouth questionnaire to Brazilian Portuguese, and to evaluate its reliability and validity to be applied in neck pain Brazilians' patients.

## Materials and methods

### Participants

Sixty-one volunteers with neck pain participated in this study. Thirty-five of them participated during pre-testing phase and the remaining 26 took part during psychometric properties analysis. Participants were eligible to participate in the study if they had neck pain and aged 18–60 years. Volunteers using immobilization on upper limb or presenting any cognitive and neurological disorders that would impair on questionnaire appliance were excluded from the study.

questionnaire original version author authorized this study and confirmed the originality by electronic correspondence. This study received approval from the Human Research Ethics Committee of the Universidade Paulista (CAAE: 31477314.0.0000.5512) and written consent clarifying the experimental protocol was obtained from each volunteer.

### Procedures

The procedures followed translation, cultural adaptation and validation processes according to Guillemin and Bombardier<sup>15</sup> and Beaton and Bombardier<sup>7</sup> which consisted of translation, back-translation (the translation back to its original language), committee analyses and pre-test (Fig. 1).

Neck Bournemouth questionnaire was translated to Portuguese by two independent, Brazilians and English fluent translators. Only one translator was aware of the concepts being examined by NBQ and the questionnaires new versions were elaborated in an independent manner (T1 and T2). These versions were compared and discussed by the committee, which was composed of: four specialized physical therapists

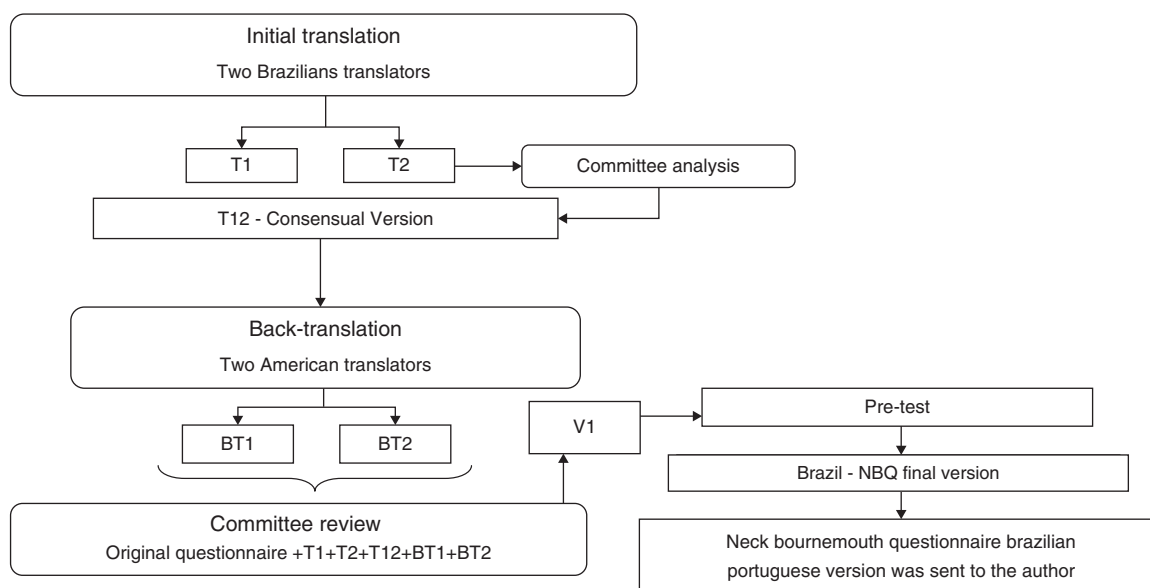


Fig. 1 – Study flowchart.

and another two English-fluent translators with no previous participation in this study. If there was any disagreement, alterations to elaborate the consensual Portuguese version (T12) were made, maintaining the main characteristics of the original questionnaire.

T12 version was translated back to English by two independent and English native translators (BT1 and BT2), who did not possess access to the original questionnaire.

In the sequence, committee members participated in a second meeting in which they pointed the differences among translated versions (T1, T2, T12, BT1 and BT2) and the original questionnaire. They verified semantics, idiomatic and cultural equivalence, and they modified or eliminated irrelevant, inadequate or ambiguous topics. The second meeting resulted in a pre-final version (V1) which was used for pre-test.

Pre-test was performed to verify the comprehension and acceptability of the questions and answers. Researcher read the content of the questionnaire out loud to each volunteer and they were asked to answer if they comprehended, to comment about what they understood and to suggest modifications in case there was any topic mistaken.<sup>16</sup> All the topics showed comprehension level higher than 90% by the volunteers. After pre-test phase, final version (Brazil-NBQ) was sent to the NBQ author for approval (Fig. 2).

### Score calculation

NBQ comprises seven questions, each representing a different dimension of the neck pain. The seven topics include (1) pain intensity, (2) functional status in daily living and (3) social activities, affective dimensions of (4) anxiety and (5) depression, cognitive aspects of (6) fear-avoidance behavior and (7) pain locus of control. Each topic of NBQ was scored using an 11-point Numerical Rating Scale, with total score ranging from 0 to 70, obtained by totaling the scores of each of the seven topics, with higher scores reflecting more pain and disability.<sup>4,11,14</sup>

### Reliability

Interrater and intrarater reliability analysis were performed in order to evaluate the reproducibility of the questionnaire. Brazil-NBQ was applied by a researcher and, after 1 h, it was applied by a second researcher (interrater). In a period of three to seven days, the first researcher applied once again the questionnaire (intrarater). Furthermore, internal consistency was evaluated, which appreciates the interrelation of different topics or domains of a tool, measuring the homogeneity of the related topics.

### Validation

Validity analysis was performed through association among Brazil-NBQ and other questionnaires that measure pain, quality of life and function.

The Short Form Health Survey 36 (SF-36) is an assessment tool that measures quality of life. It is composed of 36 topics divided into eight domains: Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role Emotional, and Mental Health.<sup>17</sup> The correlation among Brazil-NBQ topics and their domains was based on validity process of NBQ original version.<sup>4</sup>

The Neck Disability Index (NDI) is a tool composed of 10 topics that evaluate pain and disability in patients presenting neck pain. NDI is scored using a percentage of the maximal pain and disability score.<sup>18</sup>

Numerical Rating Scale (NRS) was used for neck pain assessment, and it is an 11-point scale consisting of numbers from 0 (No pain) through 10 (Worst imaginable pain).<sup>19</sup>

### Statistical analysis

Data analysis was performed using SPSS for Windows (version 18.0, SPSS Inc.). Continuous variables are shown by

Este questionário foi desenvolvido para saber sobre a sua dor no pescoço e como ela o afeta. Por favor, responda TODAS as questões circulando UM número em CADA pergunta que melhor descreve o que você sente:

1. Durante a última semana, qual foi o nível de dor do seu pescoço

Nenhuma dor 

0	1	2	3	4	5	6	7	8	9	10
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 Pior dor possível

2. Durante a última semana, quanto a sua dor no pescoço prejudicou nas suas atividades diárias (trabalho de casa, tomar banho, colocar roupa, levantar, ler e dirigir)?

Não prejudicou 

0	1	2	3	4	5	6	7	8	9	10
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 Incapaz de desenvolver atividades

3. Durante a última semana, quanto a sua dor no pescoço prejudicou nas suas atividades recreativas, sociais e familiares?

Não prejudicou 

0	1	2	3	4	5	6	7	8	9	10
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 Incapaz de realizar atividades

4. Durante a última semana, você sentiu-se ansioso (tenso, nervoso, irritado, com dificuldade para se concentrar/relaxar)?

Não ansioso 

0	1	2	3	4	5	6	7	8	9	10
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 Muito ansioso

5. Durante a última semana, você sentiu-se deprimido (“para baixo”, triste, pessimista, infeliz)?

Não deprimido 

0	1	2	3	4	5	6	7	8	9	10
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 Muito deprimido

6. Durante a última semana, quanto a sua dor no pescoço piorou (ou poderia ter piorado) com o trabalho (tanto em casa como fora)?

Não piorou 

0	1	2	3	4	5	6	7	8	9	10
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 Piorou muito

7. Durante a última semana, quanto você conseguiu controlar (reduzir) sozinho a sua dor no pescoço?

Controlei completamente 

0	1	2	3	4	5	6	7	8	9	10
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 Nenhum tipo de controle

**Fig. 2 – Final version of Neck Bournemouth questionnaire (Brazil-NBQ).**

mean and standard deviation and the categories are demonstrated in frequency and percentage.

Test-retesting reliability was evaluated by intraclass correlation coefficient (ICC) with 95% confidence intervals (95% CI). Interrater and intrarater relative reliability was evaluated. Internal consistency of Brazil-NBQ domains were measured by Cronbach's alpha coefficient. In order to evaluate the validity, Pearson's coefficient correlation was used to verify the relation among Brazil-NBQ with VAS, NDI and SF-36.

## Results

Modifications, made by the committee during the first meeting, focused on grammatical structure of the questions and adaptations to ensure equivalence among words and also focused on cultural context. As a result, following T1 and T2 versions analysis, T12 consensual version was elaborated (Table 1).

After back-translation, committee reunited in a second meeting to discuss the differences among all of the versions and the original questionnaire. Thus, V1 version was elaborated and then it was used at pre-test (Table 2). These

versions were sent to the original questionnaire author by electronic mail.

At pre-test phase, 22 women (62.8%) and 13 men answered the new version of the questionnaire (V1). Among these volunteers, four (11.4%) did not complete elementary school and seven (20%) completed it. Twenty (57.1%) of the volunteers completed high school and four (11.4%) had graduation degree. At this phase, there was no suggestion about the topics from the participants neither difficulties on topics comprehension. All of the questions showed comprehension level higher than 90%, with no necessary modifications.

Twenty-six volunteers participated at reliability and validity analysis phase. The volunteers aged  $33.6 \pm 13.4$  years; 18 of them (69.3%) were women; three (11.5%) had not completed elementary school, three (11.5%) completed elementary school, 17 (65.3%) completed high school and three (11.5%) graduated from college.

Brazil-NBQ showed an intrarater of total score ICC of 0.96 (95% CI, 0.91–0.98) and interrater ICC of 0.87 (95% CI, 0.73–0.93) (Table 3). Internal consistency showed Cronbach's alpha of 0.98. Correlation between Brazil-NBQ and SF-36 was moderate (Table 4), and among Brazil-NBQ and NRS and NDI was strong (Table 5).

**Table 1 – Translation and modification to the consensual version.**

Question topic	“T1 and T2”	Modification to “T12” consensual version
1. Over the past week, on average how would you rate your neck pain? No pain/worst pain possible	T1 – Durante a última semana, em média, como você classificaria sua dor no pescoço? Nenhuma dor/Pior dor possível T2 – Na última semana como é que, em média, você classifica o grau de dor que sentiu no pescoço? Nenhuma dor/Pior dor possível	Durante a última semana, qual foi o nível de dor do seu pescoço? Nenhuma dor/Pior dor possível
2. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, driving)? No interference/unable to carry out activities	T1 – Durante a última semana, quanto sua dor no pescoço interferiu nas suas atividades diárias (trabalho de casa, lavar, vestir, levantar, ler, dirigir)? Nenhuma interferência/Incapaz de desenvolver atividades T2 – Na última semana, em que medida a sua dor cervical (pescoço) interferiu em suas atividades diárias (limpar a casa, tomar banho, vestir-se, levantar, ler e dirigir)? Nenhuma interferência/Incapaz de realizar atividades	Durante a última semana, quanto a sua dor no pescoço prejudicou nas suas atividades diárias (trabalho de casa, tomar banho, colocar roupa, levantar, ler e dirigir)? Não prejudicou/Incapaz de desenvolver atividades
3. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities? No interference/unable to carry out activities	T1 – Durante a última semana, quanto sua dor no pescoço interferiu com sua capacidade de tomar parte em atividades recreativas, sociais e familiares? Nenhuma interferência/Incapaz de desenvolver atividades T2 – Na última semana, em que medida, a sua dor cervical (pescoço) interferiu nas suas atividades recreativas, sociais e familiares? Nenhuma interferência/Incapaz de realizar atividades	Durante a última semana, quanto a sua dor no pescoço prejudicou nas suas atividades recreativas, sociais e familiares? Não prejudicou/Incapaz de realizar atividades
4. Over the past week, how anxious (tense, uptight, irritable, difficulty in concentrating/relaxing) have you been feeling? Not at all anxious/extremely anxious	T1 – Durante a última semana, quão ansioso(a) (tenso(a), nervoso, irritável, dificuldade em se concentrar/relaxar) você tem se sentido? Nada ansioso(a)/Extremamente ansioso(a) T2 – Na última semana, sentiu-se ansioso (tenso, nervoso, irritado, com dificuldades para se concentrar/relaxar)? Não ansioso/Extremamente ansioso	Durante a última semana, você sentiu-se ansioso (tenso, nervoso, irritado, com dificuldade para se concentrar/relaxar)? Não ansioso/Muito ansioso
5. Over the past week, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, unhappy) have you been feeling? Not at all depressed/extremely depressed	T1 – Durante a última semana, quão depressivo(a) (deprimido(a), triste, melancólico(a), pessimista, infeliz) você tem se sentido? Nada deprimido (a)/Extremamente deprimido (a) T2 – Na última semana, sentiu-se deprimido (“pra baixo”, triste, pessimista, infeliz)? Não deprimido/Extremamente deprimido	Durante a última semana, você sentiu-se deprimido (“para baixo”, triste, pessimista, infeliz)? Não deprimido/Muito deprimido
6. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain? Have made it no worse/have made it much worse	T1 – Durante a última semana, como você sentiu que seu trabalho (tanto dentro como fora de casa) afetou (ou afetaria) sua dor no pescoço? Não fez piorar/Tornou muito pior T2 – Na última semana, sentiu que o seu trabalho (tanto em casa como fora) piorou (ou poderia ter piorado) a sua dor cervical (pescoço)? Não piorou/Piorou	Durante a última semana, quanto a sua dor no pescoço piorou (ou poderia ter piorado) com o trabalho (tanto em casa como fora)? Não piorou/Piorou muito
7. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own? Completely control it/no control whatsoever	T1 – Durante a última semana, quanto você foi capaz de controlar (reduzir/ajudar) por si mesmo(a) sua dor no pescoço? Controlei completamente/Nenhum controle absolutamente T2 – Na última semana, conseguiu controlar (reduzir) sozinho(a) sua dor cervical (pescoço)? Controle total/Nenhum tipo de controle	Durante a última semana, quanto você conseguiu controlar (reduzir) sozinho a sua dor no pescoço? Controlei completamente/Nenhum tipo de controle

T1, first translation; T2, second translation.

## Discussion

Neck pain is a common condition that leads to disability, however, there are few measurement tools to evaluate these patients, and the existing ones measure only pain intensity

and incapacity level.<sup>4,20</sup> NBQ is a short multidimensional instrument developed from biopsychosocial model and it includes questions on pain, disability, cognitive and affective domains. Translation and cross-cultural methods used in this study will allow NBQ utilization in the assessment of



**Table 2 – Back-translation phase. Differences between BT1 and BT2 and the original version.**

Neck Bournemouth questionnaire	Differences between BT1 and BT2 versions
1. Over the past week, on average how would you rate your neck pain?	BT1: In the past week, what was pain level of your neck? BT2: Over the past week, how would you rate your neck pain?
2. Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading, driving)? No interference/unable to carry out activities	BT1: In the past week, how much did your neck pain affect your activities of daily living (housework, taking a bath, washing clothes, standing up, reading and driving)? Not at all/Unable to perform activities BT2: Over the past week, how much has your neck pain interfered with your daily activities (housework, washing, dressing, lifting, reading and driving)? No interference/Unable to carry out activities
3. Over the past week, how much has your neck pain interfered with your ability to take part in recreational, social, and family activities? No interference/unable to carry out activities	BT1: In the past week, how much did your neck pain affect your recreational, social and family activities? Not at all/Unable to perform activities BT2: Over the past week, how much has your neck pain interfered with your recreational, social and family activities? No interference/Unable to carry out activities
4. Over the past week, how anxious (uptight, irritable, difficulty in concentrating/relaxing) have you been feeling?	BT1: In the past week, did you feel anxious (irritate, with difficulty concentrating/relaxing)? BT2: Over the past week, how anxious have you felt (irritated, with difficulty in concentrating/relaxing)?
5. Over the past week, how depressed (down-in-the dumps) have you been feeling? Not at all depressed/extremely depressed	BT1: In the past week, did you feel depressed (“low”)? Not depressed/Very depressed BT2: Over the past week, how depressed (“down”) have you felt? Not depressed/Very depressed
6. Over the past week, how have you felt your work (both inside and outside the home) has affected (or would affect) your neck pain? Have made it no worse/have made it much worse	BT1: In the past week, how much did your neck pain get worse (or could have become worse) with work (inside or outside the home)? Did not get worse/Got very much worse BT2: Over the past week, how much has your neck pain worsened (or could it have worsened) with work (both at home and away from home)? Did not worsen/Worsened a lot
7. Over the past week, how much have you been able to control (reduce/help) your neck pain on your own?	BT1: In the past week, to what extent were you able to control (reduce) your neck pain by yourself? BT2: Over the past week, how much have you managed to control (reduce) your neck pain by yourself?
BT1, first back-translation; BT2, second back-translation.	

neck symptoms in Brazilian patients in research and clinical practice.

The cross-cultural adapted questionnaire to use in another country, culture and language requires the use of a unique method to guarantee equivalence between the original questionnaire and the new adapted version. Measurements that are applied in different cultures, require to be translated linguistically well and culturally adapted to maintain the validity of the tool content at a conceptual level across

different cultures.<sup>7</sup> The translation and the cross-cultural adaptation methods used in this study have been consolidated in literature and applied in several studies,<sup>7,15</sup> including other versions of NBQ that are used in other countries.<sup>8,12</sup>

Beaton and Bombardier<sup>7</sup> recommend that at least two translated versions from the original language should be elaborated, whereas, one of the translators must be aware of the concepts being examined in the questionnaire in order to provide a reliable equivalency from a more clinical

**Table 3 – Intrarater and interrater reliability of Brazil-Neck Bournemouth questionnaire.**

Items	Intrarater		Interrater	
	ICC	95% IC	ICC	95% IC
NBQ 1	0.88	0.76–0.94	0.79	0.59–0.9
NBQ 2	0.91	0.81–0.95	0.87	0.73–0.94
NBQ 3	0.91	0.82–0.96	0.86	0.72–0.93
NBQ 4	0.92	0.84–0.96	0.87	0.74–0.94
NBQ 5	0.93	0.85–0.96	0.89	0.78–0.95
NBQ 6	0.83	0.67–0.92	0.62	0.31–0.81
NBQ 7	0.77	0.55–0.89	0.66	0.37–0.83
Total score	0.96	0.91–0.98	0.87	0.73–0.93

NBQ, Neck Bournemouth questionnaire; ICC, intraclass correlation coefficient; CI, confidence intervals.

**Table 4 – Correlation between Brazil-Neck Bournemouth questionnaire and SF-36.**

Brazil-NBQ	SF-36 scales	Pearson's coefficient correlation	
		r	p-value
NBQ 1	Bodily pain	-0.665	0.001
NBQ 2	Physical functioning	-0.439	0.025
NBQ 3	Social functioning	-0.502	0.009
NBQ 4	Role-emotional scale	-0.460	0.017
NBQ 5	Mental health scale	-0.509	0.008
NBQ 6	Question 8	-0.587	0.002
NBQ 7	General health scale	-0.443	0.024

NBQ, Neck Bournemouth questionnaire; SF-36, Short Form Health Survey 36.

**Table 5 – Correlation among Brazil-Neck Bournemouth questionnaire, Numerical Rating Scale and Neck Disability Index.**

Variables	Neck Bournemouth questionnaire	
	r	p
Numerical rating score	0.70	0.001
Neck Disability Index	0.79	0.001

perspective. The second translator should neither be aware nor informed of the concepts in order to offer a translation that reflects the language used by the population, highlighting ambiguous meanings in the original questionnaire. The back translation phase is a validity process that the translated version is reflecting the same topic content as the original version and it highlights gross inconsistencies or conceptual errors in the translation.

In the translation initial phase of Brazil-NBQ version, T12 consensual version was elaborated in order to avoid ambiguous or hard-comprehensible words such as 'média', 'interferência', 'melancólico' and 'extremamente', which were present in at least one of the translations. In the back-translation phase, there was no difference between translation meanings with the original version, indicating that the adaptations performed at initial phase did not alter topics meanings. In the pre-test phase, all of Brazil-NBQ topics obtained comprehension higher than 90%, which indicates that this questionnaire new version is easily understood.

After translation and cultural adaptation of a questionnaire, it is essential to evaluate psychometric properties of the translated version. The Brazil-NBQ showed resembling psychometrics proprieties than other versions of NBQ. Test-retest reliability of original NBQ has Intraclass Correlation Coefficient (ICC) of 0.65, while the Dutch version NBQ ranged from 0.83 to 0.99, French version showed an ICC of 0.9, Danish ICC was 0.96 and German ICC was 0.99. The internal consistency of original NBQ was Cronbach's alpha coefficient of 0.9 and the German version was 0.79 and Danish was 0.89.<sup>8,12-14</sup> Clinically significant improvement of NBQ was verified by Bolton,<sup>21</sup> who found for the total score 13 or more points, knowing that a percentage change in the scores of 36% or more were associated with clinically

significant improvement. Futures studies should verify the responsiveness of NBQ Brazilian Version.

## Conclusion

Neck Bournemouth questionnaire was translated and culturally adapted to Portuguese language in a comprehensive version, that demonstrated to be quick, easy to understand, valid and reliable to evaluate patients' neck pain.

## Conflicts of interest

The authors declare no conflicts of interest.

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