Validation of the Brazilian version of Knowledge and Attitudes of Pain questionnaire

Validação da versão brasileira do questionário Knowledge and Attitudes of Pain

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ABSTRACT

BACKGROUND AND OBJECTIVES: Health professionals attitudes and beliefs about musculoskeletal pain have a negative influence on patient beliefs and outcomes. However, there is no gold standard for assessing knowledge and attitudes toward pain among these professionals. Thus, the objective of the present study was to translate, adapt and validate the Knowledge and Attitudes of Pain (KNAP) questionnaire into Brazilian Portuguese (KNAP-Br), apply the questionnaire and analyze the correlation of its results with the Neurophysiological Pain Questionnaire (NPQ).

METHODS: After being translated, back-translated and adapted, the NKAP-Br was applied to 60 physical therapy and medicine students for validation. The correlation between the results obtained by multiplying the scores of the questions of the NKAP-Br instrument and the NPQ was evaluated. To assess reliability, another 200 students responded to the initial KNAP-Br (T1), performed the Pain Education Program (PEP) in one week and one week after T1, the participants received access to answer the KNAP-Br end (T2).

RESULTS: Concurrent validity was assessed by the correlation between NPQ and the final KNAP-Br score. A significant correlation was found between the NPQ result (0.3 and p-value=0.0001) and the KNAP-Br score. Intragroups, 84% improved in the KNAP-Br score after studying PEP, 43.50% improved at or above the minimal detectable difference (MDD) and at or above the minimal important difference (MID).

CONCLUSION: The questionnaire was translated and adapted respecting the Brazilian population cultural aspects and presented satisfactory reliability and construct validity, being considered valid for the assessment of knowledge and the interpretation of pain by health professionals.

Keywords: Pain, Pain measurement, Physical therapy specialty.

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HIGHLIGHTS
• The Knowledge and Attitudes of Pain (KNAP) is a recently developed questionnaire for health care professionals.
• KNAP is recommended during clinical or scientific pain knowledge research.
• KNAP-Br has an appropriate measurement for use in Brazil, presenting reliability, internal consistency, and reproducibility.

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RESUMO

JUSTIFICATIVA E OBJETIVOS: As atitudes e as crenças dos profissionais de saúde sobre dor musculoesquelética têm influência negativa nas crenças e resultados dos pacientes. Entretanto, não existe um padrão ouro para avaliar o conhecimento e as atitudes relativas à dor entre esses profissionais. Dessa forma, o objetivo deste estudo foi traduzir, adaptar e validar o questionário *Knowledge and Attitudes of Pain* (KNAP) para a língua portuguesa brasileira (KNAP-Br), aplicar o questionário e analisar a correlação dos seus resultados com o Questionário Neurofisiológico de Dor (QND).

MÉTODOS: Após ser traduzido, retrotraduzido e adaptado, o KNAP-Br foi aplicado em 60 estudantes de fisioterapia ou medicina para validação. Foi avaliada a correlação entre os resultados obtidos pela multiplicação dos escores das questões dos instrumentos KNAP-Br e QND. Para avaliação da confiabilidade, outros 200 estudantes responderam o KNAP-Br inicial (T1), realizaram em uma semana o Programa de Educação em Dor (PED) e uma semana após T1 os participantes receberam acesso para responder o KNAP-Br final (T2).

RESULTADOS: A validade concorrente foi avaliada pela correlação entre QND e o escore final do KNAP-Br. Foi encontrada uma correlação significativa entre o resultado do QND (0,3 e valor de p=0,0001) e o escore do KNAP-Br. Intragrupos, 84% melhoraram no escore do KNAP-Br após estudar PED, 43,50% melhoraram igual ou acima da menor diferença detectável (MDD) e igual ou acima da diferença mínima importante (DMI).

CONCLUSÃO: O questionário foi traduzido e adaptado, respeitando os aspectos culturais da população brasileira, e apresentou satisfatória confiabilidade e validade de constructo, sendo considerado válido para avaliação do conhecimento e para a interpretação da dor por profissionais de saúde.

Descritores: Dor, Especialidade de fisioterapia, Medição da dor.

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INTRODUCTION

In Brazil, it is estimated that between 40% and 70% of the economically active population suffers with chronic pain, being an important factor in work absenteeism, which generates costs both to economy and to health sector[1]. Along with this data, the prevalence of musculoskeletal pain has also been increasing, since changes in life habits and stress development in the lives of active individuals are remarkable[2].

Attitudes and beliefs about musculoskeletal pain by health care professionals have a negative influence on patients' beliefs and outcomes[3-5]. Professional's ability to identify their beliefs about pain is crucial, given the significant role they can play in modifying patient's biopsychosocial beliefs about pain[5]. Thus, identifying health care professional's beliefs that may contribute to suboptimal clinical outcomes is a relevant prerequisite for improving the quality of pain patient care[6].

The Pain Education Program (PEP) is a cognitive-based intervention to teach people about the biology and physiology of pain and to not emphasize the issues associated with anatomical structures, focusing on the biopsychosocial factors that contribute to pain development[7]. Given the influence of health care professionals in the recovery of a pain patient by providing PEP and developing and testing other pain education programs, it is important to assess the knowledge and attitudes of these professionals about modern pain neuroscience, including undergraduate students[8]. PEP research is dominated by randomized clinical trials and systematic reviews, all aimed at exploring its effectiveness[9-12].

Currently, questionnaires that aim to evaluate knowledge, attitudes and beliefs of health professionals are available and these are encouraged in literature for enabling the construction of health values[5,6,13,14]. In general, pain assessment is based on a fragmented conception of the human being, which separates biological aspects from subjective and behavioral aspects, leading to protocolized and mechanized practices[15], being Pain Attitudes and Beliefs Scale for Physiotherapists (PABS)[16,17] and Neurophysiological Pain Questionnaire (NSQ)[18] considered secondary measures.

One of the most tested instruments is PABS[17], developed in 2003 and adapted into Brazilian Portuguese in 2012 (PABS-PT). Over time, it was shown that PABS-PT does not fully align with current pain neuroscience; relevant topics regarding pain biology and physiology such as pain system adaptation, central nervous system sensitization, the top-down and bottom-up systems, and the neuromatrix of pain are not included.

PABS-PT is composed of 19 questions grouped into two domains: biomedical orientation (composed of questions 1 through 10) and behavioral orientation (composed of questions 11 through 19) and aims to measure attitudes and beliefs, not current knowledge about pain, which is an important outcome measure in PEP. In addition, the assessment properties and accuracy are insufficient; information on interpretability and content validity is lacking, and the biopsychosocial subscale, as well as the separate PABS-PT scales, contains low discriminative ability[19,20]. Also, the Health Care Providers' Pain and Impairment

Relationship Scale (HC-PAIRS), in its translated version, has been used to evaluate physical therapists' pain knowledge[21]. This scale has four domains: functional expectancy, social, need for healing and projected cognition. However, the HC-PAIRS was developed from the Pain and Impairment Relationship Scale (PAIRS), which was originally created to evaluate the attitudes and beliefs of individuals with chronic low back pain[22].

NPQ[23] is a self-administered instrument, originally developed with 19 items that assess knowledge related to pain neurophysiology. After assessing NPQ psychometric properties, only 12 items were considered enough to achieve the same results as the original questionnaire[24]. The NPQ measures the knowledge, but not the attitudes, of health care professionals, and its psychometric properties have only been partially examined. Insufficient and psychometrically unnecessary NPQ items need further examination[24]. The nature of true-false questions in the questionnaire results is susceptible to interpretation, and therefore NPQ is limited in content validity.

Health professional's inadequate knowledge and wrong beliefs are among the main barriers to adequate pain control, since they cause patient's pain complaint underestimation, use of inappropriate analgesic regimens and maintenance of myths and misconceptions of patients and family members[25]. Team's perception about different attitudes of the patient in the face of pain is important, in the sense of contributing to planning quick and appropriate actions, aiming at considering patient's individuality, singularity, lifestyle, beliefs and cultural values[26].

In this sense, a questionnaire was recently developed and validated in English based on the modern neuroscience of pain, aiming at the evaluation of knowledge and conduct in cases of pain, the Knowledge and Attitudes of Pain (KNAP). It is a questionnaire with 30 items divided into two domains, in which the answer is given through a scale from 1 to 6, thus measuring to what extent the interviewee agrees or disagrees with the statement[3]. For the KNAP to be better applied, it is important to show its validity in different countries, as well as the correlation of its results with those of other pain knowledge assessment methods.

Given the above, the present study's objective was the translation and validation of KNAP instrument into Brazilian Portuguese language (KNAP-Br), which will allow a quick identification and better evaluation of the knowledge and conduct for pain cases in Brazil. This study proposed the KNAP questionnaire validation in Portuguese language, with the objective of making it available for use among Brazilian professionals.

METHODS

This is a methodological study aimed at the adaptation and validation of KNAP. Permission for the cross-cultural adaptation process was granted by the author Caroline Schnakers, via e-mail. The COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) recommendations were considered. This research was approved by the Federal University of Alfenas Research Ethics Committee (*Comitê de Ética em Pesquisa da Universidade Federal de Alfenas* - CAAE: 46178121.9.0000.5142).

Appliance

NPQ was used to assess knowledge about the neurophysiology of pain. It is a self-administered instrument, adapted to the Portuguese language, composed of 12 items, which assesses knowledge related to the neurophysiology of pain, in which each item presents three response options: true, false and undecided[23]. The result was described in absolute and relative values of items answered by the students. Scores of 65% or higher, in 90% of the participants, were considered satisfactory to evaluate the neurophysiological knowledge about pain.

The Brazilian Portuguese KNAP (KNAP-Br) was used to assess two domains: pain physiology and influencing factors; and pain management. The 30 self-administered questions (supplementary material) were developed from the translation of KNAP and rated on a scale from 1 to 6: 1. totally disagree; 2. strongly disagree; 3. partially disagree; 4. partially agree; 5. strongly agree; and 6. totally agree.

PEP was applied through 8 lessons of one minute each, from the section Understanding Pain of the Retrain Pain group (http://retrainpain.org/português). The topics covered in PEP were acceptance, pain as an alarm, sleep, relaxation, negative thoughts, return to pleasurable activities, relationships, and exercise.

Experimental procedure

The cross-cultural adaptation and validation process involved four stages: translation and cultural adaptation of the instrument; pilot test and retest in 10 physical therapy and medical students; validation in 60 physical therapy and medical students; and reliability in 200 physical therapy and medical students. All research participants signed the Free and Informed Consent Term (FICT) and received a copy by e-mail with the completed questionnaire. The inclusion criterion was being an undergraduate physical therapy or medical student. The exclusion criteria were not being a physical therapy or medical student and not completing the entire process.

Translation and cultural adaptation of the instrument

Initially, the translation and cultural adaptation of the KNAP instrument was carried out, duly authorized by the main author of the instrument. Two Brazilian translators, fluent in English and aware of the research objectives, carried out the procedure, one with scientific knowledge in the area and the other a lay translator. The two translations were compared and a consensus translation was obtained. From the translated version chosen by consensus, the back translation of the questionnaire into the original language was performed. This process was carried out by two British citizens living in Brazil. Both versions of this step were also harmonized in a final back-translated version, which proved to be grammatically and semantically equivalent to the original instrument.

Pilot test and retest

For the pilot test, 10 physical therapy and medical students were randomly selected to apply the instrument and ask about their understanding of the questions. The final version of KNAP-Br translated and adapted to Portuguese was then made

available. The reproducibility of the instrument was tested by its application in two different moments, with a one-week interval (test-retest), in 10 students selected for the pilot test.

Validation

Then, for validation, the correlation between the results obtained by multiplying the scores of the questions of the NKAP-Br and NPQ instruments in 60 physical therapy or medical students was evaluated. NPQ was chosen because it is a test of short duration and easy application, translated and adapted to Portuguese, used to evaluate the level of neurophysiological knowledge of pain in Brazilian patients[27].

Reliability

Finally, to study test-retest reliability, 200 physical therapy and medical students were selected. These students responded to initial KNAP-Br (T1) and were invited to fill PEP in one week. One week after T1, participants were given access to answer final KNAP-Br (T2). This research design was based on another paper[28].

A single question was added after studying the PEP course (T2), to assess the participant's own perception of knowledge and attitudes since the first response to the questionnaire (T1)[29,30]. The statement was: "after studying pain education I have…": 1) not improved in knowledge and attitudes toward pain, 2) improved a little in knowledge and attitudes toward pain, but this is not important, 3) improved in knowledge and attitudes toward pain, and 4) improved a lot in knowledge and attitudes toward pain.

Test-retest reliability was assessed by means of intraclass correlation coefficients (ICC - 2.1), with an ICC >0.75 considered adequate. Measurement errors were analyzed by calculating the Standard Error of the Mean (SEM= SD$\sqrt{1-ICC}$). The smallest detectable difference (SDD) was calculated as 1.96x$\sqrt{2}$xSEM. Data from T1 and T2, two weeks apart, were used to determine ICC, SEM and SDD.

KNAP-Br internal consistency was examined using Cronbach's α. The alpha value must be positive, ranging from zero to one, with values below 0.6 considered inadmissible; the higher the value, the more consistent the instrument is and the more homogeneous and congruent the scale is. An optimal value is considered when the result obtained is >0.7[31]. To verify the relationship between KNAP-Br and NPQ survey instruments, Pearson's correlation was performed, adopting a significance level of 0.05.

RESULTS

200 individuals participated in stage 4 of this research, 136 women (68%) and 64 men (32%), with a mean age of 25.8 years. Table 1 shows the participants' sociodemographic characteristics.

Table 2 presents the reliability and construct validity data, and the stability and criterion validity of this study.

To measure reliability, Cronbach α coefficient was used, a coefficient by which the reliability of instruments with dicho-

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Table 1. Characteristics of the study population regarding sociodemographic information.

Characteristics	Total=200 n (%)
Gender	
Male	66 (33.00)
Female	134 (67.00)
Age (Years)	
18–24	43 (21.50)
25–34	132 (66.00)
35–44	25 (12.50)
Ethnicity	
White	35 (17.50)
Mixed	134 (67.00)
Black	29 (14.50)
Other	2 (1.00).
Marital status	
Single	174 (87.00)
Married	20 (10.00)
Divorced	6 (3.00)
Family income	
Less than R$999	68 (34.00)
R$1.000 to R$1.999	91 (45.50)
R$2.000 to R$4.999	41 (20.50)

Table 2. Reliability study: internal consistency, stability and criterion validity between KNAP-Br and NPQ questionnaires.

	Cronbach's α coefficient	Pearson's correlation coefficient	Test-retest	Confidence interval (CI) (95%)
KNAP-Br and NPQ	0.71	0.74	0.91 0.95	0.89-0.95* 0.92-0.97*

Internal consistency was calculated using Cronbach α Coefficient. Values above 0.6 indicate consistency. Criterion validity was investigated using Pearson's correlation coefficient. Stability was tested by test-retest (intraclass correlation coefficient), with 95% CI and 5% significance level, p=0.05.

*p-value: 0.0001; KNAP-Br = Knowledge and Attitudes of Pain; NPQ = Neurophysiological Pain Questionnaire.

tomous items is estimated. Therefore, the present instrument presented a valid reliability (equal to 0.71) for this version.

Construct validity was assessed by the correlation between NPQ and the KNAP-Br final score; Pearson's correlation was used as the measurement method, which showed validation with the values found of 0.71 and p=0.0001.

To determine stability, the test-and-retest methodology was used, which allows for results with low significance variations when performed at different times[32], and KNAP-Br proved adequate with a confidence interval close to 95% and p=0.001.

The Minimal Important Difference (MID) in pain knowledge and interpretation after one week of PED is presented in Table 3. Intragroup, 84% of participants improved on KNAP-Br score after studying PED, 43.50% improved equal to or above Minimal Detectable Difference (MDD) and equal to or above MID.

For category 3, "improved," MID was 6.76 (95%-CI 1.89; 7.63), slightly below MDD, 90%: 4.99. For category 4, "greatly improved," MID was 8.34, above MDD, 90%.

Table 3. Minimal important difference in knowledge and interpretation of pain after one week of Pain Education Program

Category	n (%)	MID (n = 200)
1: no improvement	0 (0.0)	-
2: there was a small improvement but this is not important	32 (16.00)	5.54 (95%CI 2.24; 9.54)
3: improved	87 (43.50)	6.76 (95%CI 1.89; 7.63)
4: improved a lot	81 (40.50)	8.34 (95%CI 5.18; 10.32)

MID = Minimum Important Difference, n = sample, CI = confidence interval.

DISCUSSION

The results found showed that KNAP-Br has an appropriate measurement for use in Brazil, presenting reliability, internal consistency, and reproducibility, besides correlating positively with NPQ.

Compared to the survey used as reference[3], it can be noted that a parallel was drawn as to the results obtained, since the percentages are very close to those found in this study. In both surveys, the population that reports no knowledge evolution is null, and the population that says it does not see importance in the knowledge acquired is 6.6% in the initial study and 16% in the Brazilian version. On the other hand, the population that observed improvement or much improvement after PED application is, respectively, 50% and 43.4% in the reference study, and 43.5% and 40.5% in the present analysis. Given the above, KNAP-Br is eligible for detection of relevant clinical changes in the development and behavior of pain after PED, resulting in an improvement of 84% within the evaluated population[3].

In view of the problems involved in pain study and understanding, it is essential to develop instruments that correspond to the needs of modern clinical practice. Considering KNAP-Br, it is expected that its application will be a compass for the evaluation and a consequent adequate approach in pain management.

CONCLUSION

The KNAP-Br version was culturally adapted and showed satisfactory reliability and construct validity, being considered valid for assessment of knowledge and interpretation of pain in health professionals. Other measurement properties may be further analyzed in future studies.

AUTHORS' CONTRIBUTIONS

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Conceptualization, Research, Writing - Review and Editing, Validation
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Statistical Analysis, Funding Acquisition, Conceptualization, Resource Management, Project Management, Research, Writing - Preparation of the Original, Writing - Review and Editing, Supervision

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