CROSS-CULTURAL ADAPTATION AND PSYCHOMETRIC TESTING OF THE FRENCH VERSION OF THE KNOWLEDGE AND ATTITUDES OF PAIN (KNAP) QUESTIONNAIRE

Wouter Munneke [a] [b] [c], Margot De Kooning [a] [b], Jo Nijs [a] [b] [d], Julie Leclercq [c], Clara George [c], Nathalie Roussel [e], Stephen Bornheim [c], Anneke Beetsma [f], Iris Reynebeau [a] [b], Christophe Demoulin [c]

[a]*Department of Physiotherapy, Human Physiology and Anatomy, Faculty of Physical Education and Physiotherapy, Vrije Universiteit Brussel, 1090 Brussels, Belgium*

[b]*Pain in Motion International Research Group (PiM), Belgium*

[c]*Department of Sport and Rehabilitation Sciences, University of Liège, Liege, Belgium*

[d]*Institute of Neuroscience and Physiology, Department of Health and Rehabilitation, Unit of Physiotherapy, University of Gothenburg, Sweden*

[e]*Department of Physiotherapy and Rehabilitation Sciences (MOVANT), Antwerp, Belgium*

[f]*Department of Health Care Studies, School for Physiotherapy, Hanze University of Applied Sciences Groningen, the Netherlands*

Dear Editor,

The management of chronic pain by healthcare professionals (HCPs) is partly determined by their knowledge and attitudes towards pain, which predict their therapeutic decisions and treatment outcomes [1], [2], [3]. A stronger biomedical approach is associated with lower adherence to pain management guidelines, with poorer pain and disability outcomes compared with HCPs who use a biopsychosocial approach [1,2,4]. Therefore, it is important to both identify and differentiate between HCPs' knowledge, attitudes and beliefs [3].

Many questionnaires have been developed and used to evaluate the knowledge and attitudes of HCPs regarding chronic pain. Commonly used questionnaires include the Revised Neurophysiology of Pain Questionnaire (RNPQ) and the Pain Attitudes and Beliefs Questionnaire for Physiotherapists (PABS-PT) [5]. However, these questionnaires have several limitations. The PABS-PT is missing elements of modern pain science, eg, neuroplasticity and the pain neuromatrix, and the PABS-PT subscales have low discriminative abilities [6,7]. The RNPQ measures knowledge, but not attitudes, and is rated using true-false responses that do not reflect HCPs' convictions. Therefore, Beetsma et al. (2020) developed the Knowledge and Attitudes of Pain (KNAP) questionnaire [6]. This questionnaire assesses both HCPs'

knowledge about modern pain science and their biopsychosocial attitudes towards pain. It is scored on a 6-point Likert scale ranging from completely disagree to completely agree and has adequate measurement properties [6]. The original paper provided both a Dutch and an English version. However, a French version of this questionnaire has not yet been developed.

This study aimed to translate and cross-culturally adapt the KNAP into French and to test its psychometric properties in graduate and undergraduate HCPs.

This study involved two phases: a phase of translation and cultural adaptation and a phase of assessment of the measurement properties. The study was approved by the Liège University Hospital Ethics Committee (2021/421).

The translation and cultural adaptation phase was carried out in accordance with all 5 recommended stages described by Beaton and the COSMIN Study Design checklist for Patient-reported outcome measurement instruments [8,9]. (1) The English version of the KNAP was individually translated and culturally adapted by 2 English-French speaking experts (CD and VG, native French speakers). CD is an expert in chronic pain and VG is a professional translator who does not have a healthcare background. (2) Both translators reached a consensus on the synthesis of the French translations. (3) Two other English-French speaking experts (SB and AS, native English speakers), who were unfamiliar with the original version of the KNAP questionnaire, individually back-translated the questionnaire into English. (4) The 4 bilingual experts, plus an expert in chronic pain (NR) and a linguist reviewed the translations and reached a consensus for the prefinal version of the French KNAP questionnaire. In step four, 18 modifications were made during the expert meeting. One of the developers of the original questionnaire (AB) was contacted to ensure that the final translation reflected the original version of the questionnaire. (5) 20 native French-speaking participants (5 doctors, 5 physiotherapists, 5 medical students and 5 physiotherapy students) completed the questionnaire and were asked about any difficulties encountered during completion. After the testing of this pre-final version, the expert committee used the comments collected to make 3 more modifications to reach the final, consensual version of the French KNAP (KNAP-FR, Appendix 1).

The KNAP questionnaire consists of 30 items, each scored on a 6-point Likert scale, from "strongly disagree" to "strongly agree". In accordance with the calculation method of the original questionnaire, item scores were recoded into Rasch scores, 13 item scores were flipped, and the total scores were converted into scores ranging from 0 to 150. Higher scores indicate knowledge and attitudes that reflect modern pain neuroscience. Details of the scoring and recoding procedures are provided in the original article, Appendix A. Supplementary data [6].

To assess the measurement properties of the KNAP-FR, French-speaking graduate and undergraduate HCPs were recruited in Belgium between February and March 2022. Medical doctors and physiotherapists who treated people with chronic musculoskeletal pain were recruited in hospitals and different independent practices in Belgium. Furthermore, within the University of Liège, third- and fourth-year physiotherapy students and fourth- to sixth-year medical students were invited to participate. The exclusion criterion was age below 18 years.

In total, 101 participants were included: 21 doctors, 27 physiotherapists, 26 medical students, and 27 physiotherapy students. The characteristics of the participants and median scores (first; third quartile)

are shown in Table 1. Participants completed a battery of questionnaires including demographic characteristics, the KNAP-FR questionnaire, the French RNPQ and the adapted version of the French PABS-PT, either on paper or electronically. One week after completing the questionnaires, participants were invited to complete the KNAP-FR questionnaire again. Participants who had attended a chronic musculoskeletal pain course were excluded from the retest phases. Of the 101 participants, 53 participants completed the retest evaluation.

Table 1. Characteristics of the study sample.

|	Medical doctors (*n* = 21)	Physiotherapists (*n* = 27)	Medical students (*n* = 26)	Physiotherapy students (*n* = 27)	Total (*n* = 101)	Test-retest (*n* = 53)	p-value
Age, years	33 (27.5; 49.5)	25 (24; 30)	23 (22.75; 24)	23 (21; 24)	24 (23; 27.5)	24 (22.5; 26.5)	0.194
Sex,% female	52%	67%	85%	59%	66%	70%	0.720
Nationality:							
- Belgian	91%	63%	92%	74%	79%	77%	0.847
- French	/	37%	4%	26%	18%	21%	
- Other	9%	/	4%	/	3%	2%	
Current chronic musculoskeletal pain:							
- Yes	14%	4%	15%	11%	11%	8%	0.776
- No, but a history of it	19%	26%	12%	4%	15%	17%	
- No	67%	70%	73%	85%	74%	75%	
KNAP-FR total score	83.15 (80.57; 86.63)	86.21 (83.88; 92.84)	83.33 (81.65; 86.41)	85.00 (82.44; 89.26)	84.25 (81.74; 87.46)	83.88 (81.24; 88.12)	0.073
RNPQ total score	8 (8; 9)	8 (8; 10)	9 (8; 9)	9 (8; 10)	8 (8; 9)	9 (8; 10)	0.598
PABS-PT total score	21 (18; 23.5)	21 (18; 25)	17.5 (15; 20)	21 (18; 21)	20 (17; 22)	21 (17; 22.5)	0.479

KNAP-FR = French version of the Knowledge and Attitudes of Pain; *N* = number of participants; PABS-PT = Pain Attitudes and Beliefs Questionnaire for Physiotherapists; RNPQ = Revised Neurophysiology of Pain Questionnaire; / = none of the participants provided this response.
Data are proportions or median (Q1; Q3). The p-value was calculated between groups total and test-retest. A p-value < 0.05 was considered statistically significant.

The interpretability of the measurement properties was adequate. None of the participants scored the minimum or maximum overall scores, therefore, there was no floor or ceiling effect (<15% of the observations had a maximum or minimum overall score). Data were not missing for any items. The distribution of the scores per item is shown in Fig. 1.

The Cronbach α coefficient (0.71) was between 0.70 and 0.95, reflecting adequate internal consistency [10]. The test-retest reliability was determined by calculating the intraclass correlation coefficient (ICC) (ICC) using a single-measurement, absolute-agreement, two-way mixed effects model [11]. The ICC was 0.87 (95% CI, 0.79–0.93), reflecting good reliability [12]. The Mann-Whitney U test was used to analyse whether the test-retest group represented the total sample. No significant differences were found. The standard error of measurement (SEM) and minimal detectable change (MDC) were calculated from the test-retest reliability [13]. The SEM calculation was $SD \times \sqrt{(1 - ICC)}$ and the MDC with 90% CI was calculated as SEM $\times$ 1.65 $\times \sqrt{2}$. The SEM was 2.12 (95% CI, 1.58–2.73) and the MDC90 was 4.95 (90% CI, 3.69–6.37).

Figure 1. Distribution of the scores for each item of the KNAP-FR. Scores represent the percentage of responses per item. * = items that were flipped for scoring.
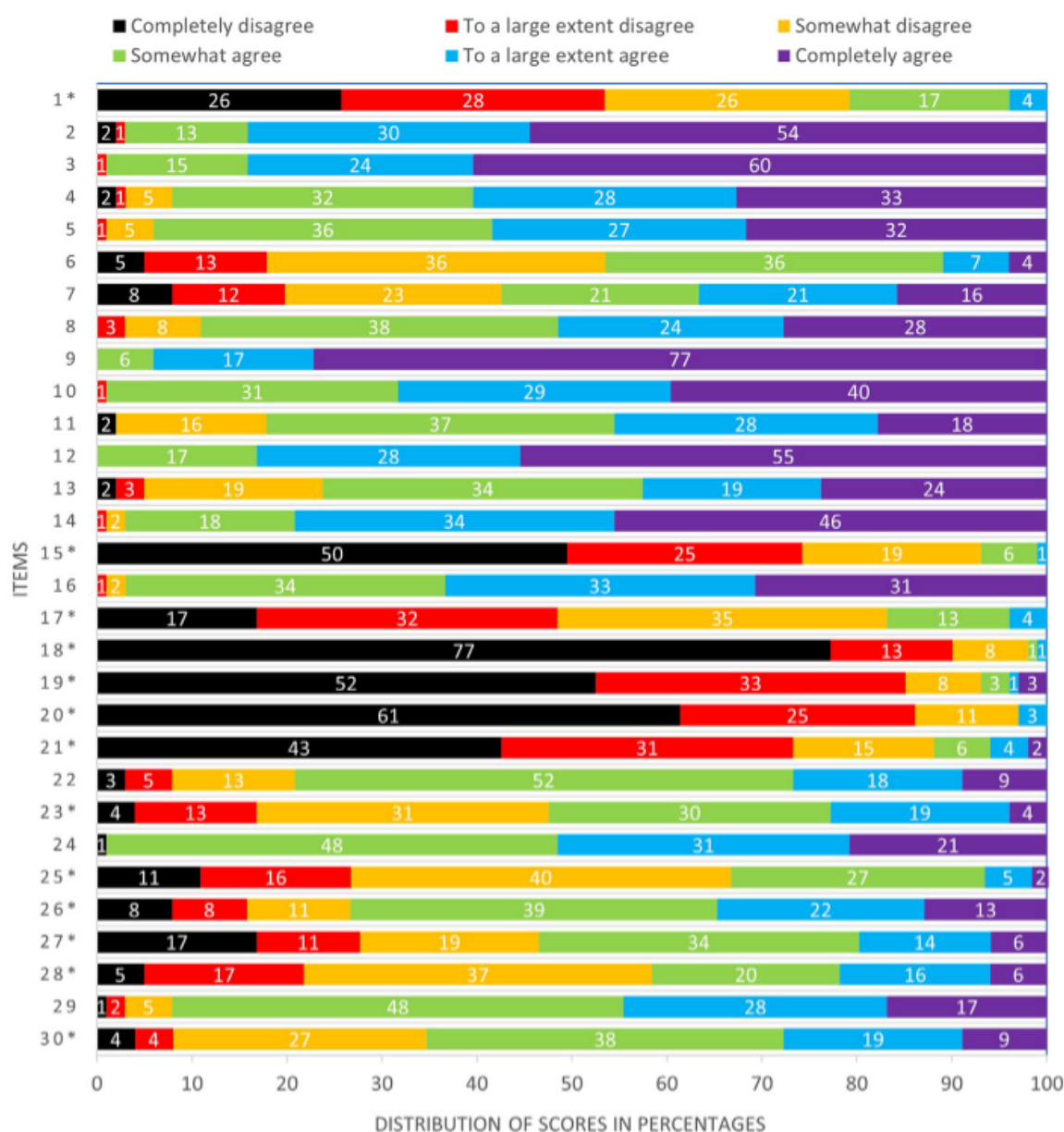
The construct validity of the KNAP-FR was evaluated by calculating the correlation coefficient between the KNAP-FR and the French RNPQ and the adapted French PABS-PT. A value <0.1 was considered as no correlation, >0.1 as weak, >0.3 as moderate and >0.7 as a strong correlation [14]. The RNPQ assesses HCPs' understanding of the neurophysiology of pain, with scores ranging from 0 to 12 [15]. Higher scores indicate better knowledge of pain. The PABS-PT was designed to assess therapists' attitudes and beliefs about low back pain. To avoid making the questionnaire battery too large, pain neurophysiology experts involved in the study selected 5 items of the 19-item version for use in the study (see Table 2). The scores of the biomedical-related items were flipped (ie, reversed) to calculate the total score (ranging from 5 to 30). A higher total score reflects stronger biopsychosocial attitudes and beliefs. The construct validity analysis found a moderate correlation between the KNAP-FR and

the adapted PABS-PT score (r(99) = 0.34, *p* < 0.001) and a weak but significant correlation with the RNPQ total score (r(99) = 0.24, *p* = 0.017).

Table 2. Adapted PABS-PT items.

Selected items	Subscale
1. Pain is a nociceptive stimulus, indicating tissue damage	Biomedical*
2. Patients with back pain should preferably practice only pain free movements	Biomedical*
3. Therapy may have been successful even if pain remains	Psychosocial
4. If patients complain of pain during exercise, I worry that damage is being caused	Biomedical*
5. Learning to cope with stress promotes recovery from back pain	Psychosocial

* Items with flipped scores.

These results are in line with the psychometric measurement properties found for the original KNAP questionnaire [6]. The original study reported similar reliability, with a Cronbach α coefficient of 0.78 and a test-retest ICC of 0.80 [6]. Furthermore, the MDC90 of 4.95, found in our study, is nearly identical to the 4.99 found in the original study [6]. Higher internal consistency was found in a validation study of the Japanese version (α = 0.92), but the MDC was larger [16]. This might result from the smaller sample size (*n* = 44) and different study population [16]. A sample size >100 is needed to ensure the stability of the variance [10]. The lack of a floor or a ceiling effect was also reported in the previous studies.

A limitation of this study is that the mean age of the medical doctors and physiotherapists was lower than the general population of HCPs. It is very likely that many HCPs in our sample graduated recently and therefore have similar median scores as students in the last semesters of their education. The narrow distribution and similar median scores between the subgroups could explain the weak and moderate correlations with the RNPQ and the adapted version of the PABS-PT. In addition, the selection of 5 items of the PABS-PT probably lowered its discriminative ability, which was already low, and weakened the correlation. Beetsma et al. (2020), who included students from the first to the fourth year, found stronger correlations with the RNPQ (*r* = 0.52) and PABS-PT (*r* = 0.58) [6]. A larger sample variance more similar to the general population of HCPs would likely have increased the construct validity, test-retest reliability and external validity [17].

The present study showed that the KNAP-FR developed in this study is acceptable, valid and has a good reliability in graduate and undergraduate medical doctors and physiotherapists.

The KNAP-FR is applicable in many health systems because French is the fifth most spoken language in the world, therefore, this study is clinically relevant. In addition, scientists and policymakers are demanding more interventions to address misconceptions concerning musculoskeletal pain in HCPs [18], [19], [20]. Valid tools to assess the effectiveness of these interventions are needed. The KNAP-FR questionnaire generates reliable and valid data for the assessment of pain knowledge and attitudes of French-speaking physiotherapists, medical doctors and undergraduate students within clinical research, education and health care management.

Future studies should assess the measurement properties, including the responsiveness to change and the minimally important differences of the KNAP-FR, within a large-scale study with a broader population of healthcare disciplines and non-HCPs, to explore the validity and the discriminative ability of the questionnaire to identify pain knowledge and attitudes in HCPs.

To conclude, the KNAP-FR is reliable and valid for the evaluation of the knowledge and attitudes of French-speaking physiotherapists, medical doctors and undergraduate students.

Data availability

Data will be made available on request.

Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.rehab.2023.101757.

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