Pain Management Nursing xxx (xxxx) xxx

Contents lists available at ScienceDirect

Pain Management Nursing

journal homepage: www.painmanagementnursing.org

Original Research

Spanish Validation of Pediatric Nurses Knowledge and Attitudes Survey Regarding Pain

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ARTICLE INFO

Article history:
Received 3 July 2022
Received in revised form 5 September 2022
Accepted 24 September 2022
Available online xxx

ABSTRACT

Background: Although pain is considered a sign/symptom codified by ICD-10, it is not frequently found in the clinical reports of children who have suffered pain due to disease or interventions. It has a negative effect on their well-being, affecting different spheres of their life. Having questionnaires adapted and validated in different languages makes it possible to compare results between different centers and countries, as well as to adapt training to the deficits found in a given population.

Aim: To validate the Spanish version of Pediatric Nurses Knowledge and Attittudes Survey Regarding Pain.

Method: A translation and back-translation process was carried out by bilingual staff. Subsequently, a test-retest was carried out among nursing professionals in the pediatric area of a third level public center of the Spanish National Health System, to analyze its internal consistency, reliability and discriminant validity.

Results: Chronbach's alpha of the test was 0.701 and Pearson's r was 0.703, intraclass correlation coefficien was 0.783. Neonatal intensive care professionals obtained a higher score (59.52%) than those working in pediatric intensive care, emergency and hospitalization, this difference being statistically significant. Likewise, professionals with a specialistś degree obtained a higher score (62.09%) compared with the rest of the professionals (56.07%).

Conclusions: The Spanish version of the Pediatric Nurses Knowledge and Attitudes Survey Regarding Pain is a valid tool to determine the knowledge and attitudes about pain of nursing professionals.

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The International Association for the Study of Pain (IASP) defines the term pain as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" (Raja et al., 2020).

This originates from sensory stimuli and is identified by children as the most stressful or distressing aspect of the illness or hospitalization process. It has a negative effect on their well-being, being related to longer hospital stays, inactivity, prolonged bed rest, poor adherence to treatment and chronic pain. It can also lead to short- and long-term emotional disturbances (Ellis et al., 2007; Hua et al., 2019; Lobete Prieto et al., 2015; Vagnoli et al., 2019).

In the early stages of life, children are not able to express the pain they feel verbally, and therefore, health care professionals, parents, and other responsible persons must be aware of its signs in order to alleviate suffering in the most appropriate way in each case (von Lützau et al., 2011). In this aspect, nursing professionals play an essential role in their identification and relief in hospitalization services (Hovde et al., 2012). Ability to obtain medical history from children continues to be one of the key elements in assessing the level of pain, since the child is the best informant of the degree of pain experienced (Ekim & Ocakcı, 2013). On the other hand, pain continues to be evaluated on many occasions in an inconsistent manner and without protocol (Espinosa Fernández et al., 2021). Although pain is considered a sign/symptom coded by International Classification of Diseases (ICD)-10 as R-52, it is not frequently found in the clinical reports of children who have

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https://doi.org/10.1016/j.pmn.2022.09.007
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Please cite this article as: D. Zuazua-Rico, A. Maestro-Gonzalez, C. Cano-García et al., Spanish Validation of Pediatric Nurses Knowledge and Attitudes Survey Regarding Pain, Pain Management Nursing, https://doi.org/10.1016/j.pmn.2022.09.007

suffered pain due to illness or interventions (Ortiz & de Noriega, 2019).

The American Academy of Pediatrics (AAP) and the American Pain Society (APS) relate the lack of knowledge about pain management and the underestimation of infant pain to the myths that exist on this subject: infants and young children feel less pain because of an underdeveloped nervous system, do not remember it in the long term, or it cannot be evaluated in a real way (AAP, 2001; Bice et al., 2014; Ekim & Ocakcı, 2013). Multiple studies show how nursing professionals have a lack of knowledge about pain, its assessment, and treatment (Ekim & Ocakcı, 2013; Ellis et al., 2007; Huth et al., 2010; Kusi Amponsah et al., 2020; Manworren, 2001; Rieman et al., 2007; von Lützau et al., 2011; Zuazua-Rico et al., 2019). To evaluate their competence in this aspect, McCaffery and Ferrell designed in 1987 a questionnaire on knowledge of pain management, Nurses' Knowledge and Attitude Survey Regarding Pain (KASRP) (Ferrell & McCaffery, 2014). It analyzes aspects related to the assessment of pain, its pharmacologic and non-pharmacologic treatment, side effects of medications, and the interdisciplinary work involved in the comprehensive care of the patient with pain. It has been uploaded and validated in several languages such as Italian, Greek, Icelandic, and Spanish (Bernardi et al., 2007; Gretarsdottir et al., 2011; Tafas et al., 2002; Zuazua-Rico et al., 2019). In 2001 Manworren adapted the questionnaire to assess the knowledge of pediatric nurses, the Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PKNAS) (Manworren, 2001), which has been validated only in Norwegian (Hovde et al., 2012). Unlike the adult version, this one contains specific items on pain in neonates, children, and adolescents, as well as a dosage adaptation in the items related to pharmacologic aspects.

It consists of 42 questions distributed as follows: 25 true/false items; 13 multiple-choice questions; and 2 clinical cases with 2 questions each. In its original version, construct validity (Chronbach's alpha 0.72) and reliability (Pearson's r 0.62) were established through the study of nursing professionals in a pediatric hospital center; in addition, the need to analyze it in global terms was established, not focusing on knowledge or attitude domains because there are questions that interrelate both domains. Although initially no minimum cut-off score was established, the authors later considered 80% of correct answers as an adequate level of knowledge (McCaffery & Robinson, 2002). On the other hand, having questionnaires adapted and validated in different languages makes it possible to compare results between different centers and countries, as well as to adapt training to the deficits found in a given population. Therefore, before generalizing the use of a questionnaire, it is necessary to evaluate its reliability and validity for the language and specific population in order to avoid making the mistake of cultural differences that may exist (Argimón Pallás & Jiménez Villas, 2013). Because there is currently no specific tool for the assessment of pain knowledge in pediatric nursing professionals in our country, the aim of the study was to translate, adapt, and validate the questionnaire, Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain, into Spanish in order to analyze its psychometric properties, providing a suitable tool for the assessment of pain.

Method

Design

This study was a validation and transcultural adaptation of the PKNAS.

Procedure

We conducted a two-step procedure for the development. The first step was a content and linguistic validation from English to Spanish. The second step was a construct and reliability validation using a test-retest procedure.

Content and Linguistic Validity

The original version of the questionnaire was translated and back-translated according to the method adapted from Brislin (Jones et al., 2001), which ensures conceptual and semantic equivalence with the original version. This procedure was carried out by 6 bilingual translators with knowledge of health care. In a first step, the original document was sent to two translators. These produced two Spanish versions that were sent to two different translators for back-translation into English. Subsequently, the four were brought together to reach a consensus on both versions by clarifying terms and giving the intended meaning to items that might be confusing in Spanish. Once a common document was obtained, two new translators carried out a new round of translation. Finally, the 6 professionals were brought together in order to obtain a final version of the questionnaire. Using this version, a pretest was carried out with 10 health professionals (5 physicians, 5 nurses) to identify words, terms, or concepts that might not be understood or interpreted systematically, as well as to suggest revisions in the wording of the questions or the structure of the questionnaire. For this purpose, the Spanish version was given to them individually, and they were urged to suggest changes in the text in writing and with justification; no changes were necessary with respect to the original text. The final version of the questionnaire can be found in Appendix 1.

Construct Validity and Reliability

The construct validity and reliability of the final questionnaire in Spanish was evaluated by means of a test-retest in nursing professionals in the pediatric area of a third level center of the Spanish public health system, between the months of October 2020 and May 2021. The participants were grouped according to the service where they carried out their professional activity, these being: hospitalization, emergency department, pediatric intensive care, and neonatal intensive care.

In the test phase, each participant was contacted individually and the objective of the study was explained in order to resolve any doubts raised by the participants. The anonymous and voluntary nature of the study was also emphasized. After their acceptance, they were given an individual envelope with the final version in Spanish, as well as a space for them to self-identify the questionnaire with a personal password for the retest phase. Completion and return of the questionnaire was considered to imply acceptance of participation. For the retest phase, the delivery of questionnaires was spaced 14 to 21 days apart in order to avoid the memory effect among the participants (Argimón Pallás & Jiménez Villas, 2013). Again, the participants of the test phase were approached and offered the questionnaire, and were asked to identify it with their personal password in order to be able to contrast it with that of the test phase.

Likewise, data were collected on age, experience as a nurse, experience as a pediatric nurse, frequency of pain treatment, and academic level (bachelorś, university expertś, master's degree, specialistś) in order to compare our results with other studies. As in other similar studies (Hovde et al., 2012; Hua et al., 2019; Lobete Prieto et al., 2015), it was not considered appropriate to

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Table 1
Socio-Demographic Variables (n = 65).

Variable				
Age (years)	30- 39 (36.9%)	40- 49 (26.2%)	20- 29 (23.1 %)	>50 (13.8%)
Division	Hospitalization (33.8%)	PICU (27.7%)	NICU (23.1%)	ED (15.4%)
Work experience (years)	0-5 (23%)	6-10 (9.2%)	11-20 (49.2%)	>20 (18.5%)
Pediatric work experience (years)	0-5 (41.5%)	6-10 (27.7%)	11-20 (21.6%)	>20 (9.2%)
Academic degree	Bachelorś (29.2%)	Expertś (10.8%)	Masterś (21.5%)	Specialist (38.5%)
Pain treatment frequency	Several times/week (53.8%)	>1 more/day (33.8%)	1 time/week or less (12.3%)	

PICU = pediatric intensive care unit; NICU = neonatal intensive care unit; ED = emergency department.

study the variable "Sex". It was not considered that this characteristic or condition could or should influence intellectual or knowledge issues.

Statistical Analysis

First, an analysis of the study population was performed. For this, the total PKNAS score was calculated by assigning a score of 1 to each correct response and 0 to each incorrect or unanswered response, with a minimum score of 0 and a maximum score of 42, subsequently expressing the score as a percentage. A descriptive analysis was also performed for each variable, providing the frequency distribution for qualitative variables, and measures of position such as mean and standard deviation in the case of quantitative variables.

Second, the psychometric properties of the questionnaire were analyzed.

Internal consistency and correlation coefficient were analyzed using Cronbach's alpha and Pearson's *r*, respectively, in order to compare our data with different validations in other languages, and the intraclass correlation coefficient (ICC) was calculated to provide greater reliability to the study. Construct validity was assessed by comparing quantitative variables using the Kruskal-Wallis test and Tukey's post hoc test to explore the discriminant validity of the questionnaire after studying the normal distribution of each variable using the Kolmogorov-Smirnov test. A significance level of 0.05 was used. Statistical analysis was performed with SPSS for Windows version 22.

Ethical Considerations

This study was designed in accordance with the principles established in the Declaration of Helsinki, the Belmont Report, the CIOMS Guidelines, and the provisions of Organic Law 3/2018, of December 5, on Personal Data Protection and Guarantee of Digital Rights. The study was authorized by the Regional Ethics and Research Committee of the Principality of Asturias (protocol no. 2021.001) as well as by the nursing management of the center.

Results

A total of 119 questionnaires were submitted, of which a total of 65 (response rate of 54.6%) were collected in the test phase and 29 in the retest phase (response rate of 24.4%). The mean total score of correct answers was 23.72 points (standard deviation [SD] = 4.47) for the test phase, and 24.68 points (SD = 4.34). The sociodemographic characteristics of the test phase are shown in Table 1. Tables 2 and 3 show the best and worst responded items.

Internal Consistency and Reliability

Cronbach's alpha was 0.701. Pearson's correlation coefficient was calculated between the test and retest phase, obtaining a value of $r = 0.703$ ($p < .001$). The intraclass correlation coefficient was 0.783 (95% confidence interval [CI] = 0.537-0.898).

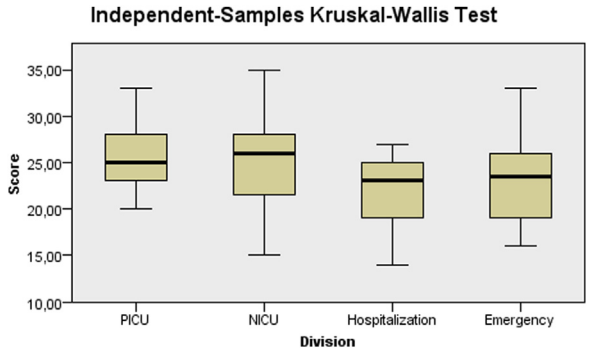

Figure 1. Distribution of correct answers by division (N = 65).

Construct Validity

Comparison of the different groups surveyed showed that the professionals in the neonatal intensive care group scored higher (59.52%, SD = 5.78) than the pediatric intensive care (59.23%, SD = 3.51), emergency (55.71%, SD = 5.10). and hospitalization (51.28%, SD = 3.66) (Fig. 1), these differences being statistically significant between the neonatal intensive care and hospitalization ($p = .012$), and pediatric intensive care and hospitalization ($p = .022$) groups.

Comparing the academic degree of the professionals, we observed that the specialistś group obtained a higher score (62.09%, SD = 3.46) compared with the master's degree (55.76%, SD = 4.71), bachelorś (50.85%, SD = 4.85), and university expertś (49.3%, SD = 2.49). We found statistically significant differences between the group specialistś and Bacherlorś ($p = .003$), and the group specialistś and university expertś ($p = .019$) (Fig. 2 and Table 4).

We found no statistically significant differences between the PKNAS score and the variables age ($p = .417$), nursing experience ($p = .727$), pediatric nursing experience ($p = .185$), and frequency of pain management ($p = .493$).

Discussion

The main purpose of this study was to evaluate the validity and reliability of the PKNAS in its Spanish version. The internal consistency of the questionnaire ($\alpha = 0.701$) is in line with that of the original version ($\alpha = 0.72$) (Manworren, 2001) and its validation to Norwegian ($\alpha = 0.71$) (Hovde et al., 2012). We can also consider that the Spanish version of the questionnaire has adequate reliability, our test-retest correlation (r = 0.703) being higher than that of the original questionnaire (r = 0.67) (Manworren, 2001) and lower than that of the Norwegian version (r = 0.83) (Hovde et al., 2012). Likewise, the intraclass correlation coefficient data (ICC = 0.783) indicate that the PKNAS is a reliable instrument.

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Table 2
Items best answered (n = 65).

Item	Question (correct answer)	% correct
5	Comparable stimuli in different people produce the same intensity of pain. (False)	90.8
14	Parents should not be present during painful procedures. (False)	84.6
18	The child/adolescent with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure. (False)	98.5
22	After the initial recommended dose of opioid analgesic, subsequent doses should be adjusted in accordance with the individual patient's response. (True)	89.2
23	The child/adolescent should be advised to use non-drug techniques alone rather than concurrently with pain medications. (False)	92.3
30	Analgesics for post-operative pain should initially be given: (around the clock on a fixed schedule)	95.4
33	The most likely explanation for why a child/adolescent with pain would request increased doses of pain medication is (The child/adolescent is experiencing increased pain)	89.2
36	Which of the following describes the best approach for cultural considerations in caring for child/adolescent in pain: (Children/adolescents should be individually assessed to determine cultural influences on pain)	83.1

Table 3
Items worst answered (n = 65).

Item	Question (correct answer)	% correct
1	Observable changes in vital signs must be relied upon to verify a childś/adolescentś statement that he has severe pain. (False)	1.5
4	Infants/child/adolescent may sleep in spite of severe pain. (True)	10.8
7	Non-drug interventions (e.g., heat. music. imagery, etc.) are very effective for mild-moderate pain control, but are rarely helpful for more severe pain. (False)	30.8
8	Children who will require repeated painful procedures (e.g., daily blood draws), should receive maximum treatrnent for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures. (True)	32.3
9	Respiratory depression rarely occurs in children/adolescents '"who have been receiving opioids over a period of months. (True)	35.4
10	Acetaminophen 650 rmg PO is approxirnatelv equal in analgesic effect to codeine 32 mg PO. (True)	26.2
12	The usual duration of analgesia of morphine IV is 4-5 hours. (False)	16.9
13	Research shovvs that promethazine (Phenergan®) is a reliable potentiator of opioid analgesics. (False)	20.0
31	A child with chronic cancer pain has been receiving daily opioid analgesics for 2 months. These doses increased during this time period. Yesterday the child was receiving morphine 20 mg/hour intravenously. Today he has been receiving 25 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is (Less than 1%)	40.0
38	Narcotic/opioid addiction is defined as psychological dependence accompanied by overwhelming concern with obtaining and using narcotics for psychic effect, not for medical reasons... (Less than 1%)	23.1
39A	Andrew is 15 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and... (8)	30.8
39B	Patient A: Your assessment, above, is made 2 hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, ... (Administer morphine 3 mg IV now)	10.8
40B	Patient B: Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, ...(Administer morphine 3 mg IV now)	20

Table 4
Post hoc analysis of differences of the PKNAS scores (n =65).

Sample 1 – Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
Expertś – Bachelorś	3.808	8.320	0.458	0.647	1.000
Expertś – Masterś	-13.107	8.711	-1.505	0.132	0.794
Expertś – Specialistś	23.751	8.046	2.952	0.003	0.019
Bachelorś – Masterś	-9.299	6.628	-1.403	0.161	0.964
Bachelorś – Specialistś	-19.943	5.727	-3.482	0.000	0.003
Masterś – Specialistś	10.644	6.281	1.695	0.090	0.541

Each row tests the null hypothesis that the sample 1 and sample 2 distributions are the same. Asymptotic significance (2-sided tests) is displayed. The significance level is .05.
Std Error = standard error; Sig. = significance; Adj. = adjusted.

The study carried out reveals that the knowledge of the pediatric nursing professionals of the center under study (University of Oviedo and Hospital Universitario Central de Asturias) is low, with no questionnaire exceeding the 80% of correct answers considered adequate. Nevertheless, the mean percentage of correct questions in the Spanish version of the PKNAS (56.07%) was higher than in similar studies carried out in Spain (51.7%), Iran (47.14%), Turkey (38.2%), Ghana (36.7%), and China (35.43%) (Ekim & Ocakcı, 2013; Hua et al., 2019; Kusi Amponsah et al., 2020; Lobete Prieto et al., 2015; Parvizy et al., 2020). Likewise, they were lower than studies carried out in Norway (72%) and the United States (66%) (Manworren, 2001; Smeland et al., 2018).

The statistically significant relationships obtained between the test score and academic degree, and the more specific work services within the field of children, confirm the discriminant validity of the Spanish version of the PKNAS, making it possible to discern between levels of knowledge as effectively as the original adult version (Ferrell & McCaffery, 2014) and its Spanish version

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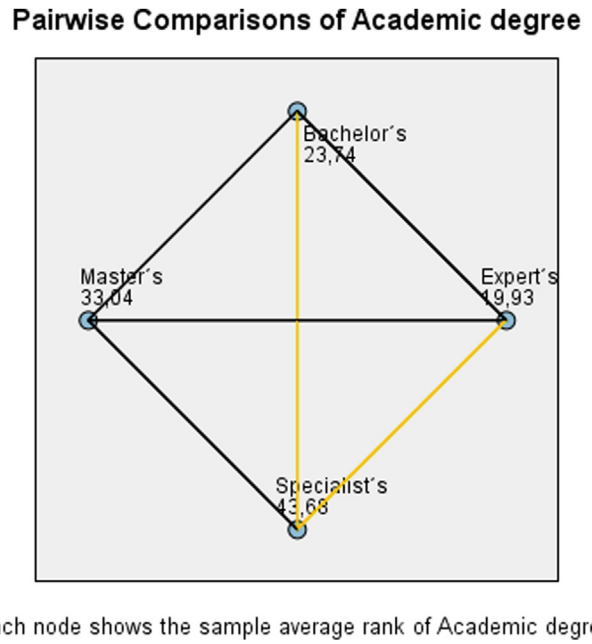

Figure 2. Post hoc analysis of differences of the Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain between nurses´academic degree (N=65).

(Zuazua-Rico et al., 2019). These differences correspond to those obtained in other studies in the United States and China (Hua et al., 2019; Manworren, 2001), which show how intensive care personnel had a higher level of knowledge. Similarly, we agree with the results from Norway (Smeland et al., 2018), since, having a similar training to that of Spain, its professionals categorized as "specialists" have better knowledge of pain than the rest of the groups related to academic training. In the case of Spain, specialistś and masterś degree have a broader theoretical and practical training exclusively for pediatric patients than professionals with generalist training. It should also be noted that other authors from non-European continents have also found significance in those with higher or specific training (Hua et al., 2019), however, an exact comparison could not be established because of the differences in the academic models that separate these countries.

Regarding the relationship between the PKNAS and the variables "experience as a general nurse" and "experience as a pediatric nurse", our results coincide with studies carried out in China, Spain, and Iran, which also found no relationship between these variables (Hua et al., 2019; Lobete Prieto et al., 2015; Parvizy et al., 2020), in contrast to the study by Smeland et al. in Norway (Smeland et al., 2018), in which they found a relationship between having more work experience as a nurse and the level of knowledge about pain. As in other studies (Hua et al., 2019; Kusi Amponsah et al., 2020; Parvizy et al., 2020; Smeland et al., 2018), we also found no significant relationships in the variables "age" and "frequency of pain treatment". The reflection of Ekim et al. (2013) could explain our results, since it refers to the advances that have taken place in recent years in terms of specialized academic training in nursing.

The best answered questions were those related to general concepts of pain. This attitude of avoiding children's suffering is common in several professionals who have participated in other studies worldwide (Kusi Amponsah et al., 2020; Smeland et al., 2018), so it seems that nursing is sensitized to children's pain. It is striking that 84.6% considered that parents should be present during painful procedures, which is very satisfactory since it has been demonstrated that their presence reduces the suffering of children (Angel Solà et al., 2015; Martínez Moreno et al., 2012). The responses with the worst percentage of correct answers, as in other studies (Ekim & Ocakcı, 2013; Kusi Amponsah et al., 2020), were mainly related to pharmacology (items: 4, 12, 13, 39B, 40B). The stigma of fear of adverse effects of opioids including respiratory depression and addiction also continues among a large part of our sample (AAP, 2001). On the other hand, it is striking that only 1.5% responded correctly to the concept that changes in vital signs are not a method of verifying the presence of severe pain and that only 10.8% knew that children and adolescents can sleep even with high levels of pain, so it seems that another of the shortcomings among our staff is the correct identification of pain. These data are not surprising given that in Spain the prescription of drugs has so far been the exclusive responsibility of the medical profession.

Several authors (Ekim & Ocakcı, 2013; Kusi Amponsah et al., 2020; Manworren, 2001; Parvizy et al., 2020; Smeland et al., 2018) agree on the poor results reported in clinical cases. This means that the professionals do not correctly evaluate the pain referred by the patient, but rather their own evaluation is conditioned by the appearance that the child may have or show at that moment. It is in the second case, in which the child appears more prostrate or affected, where the number of correct answers increased, referring to the belief that pain in children cannot be evaluated in a real way (AAP, 2001; Bice et al., 2014). It is important to remember that this is an individual experience that not everyone externalizes in the same way, so we should not be concerned about self-interpretations, since on many occasions we unintentionally cause potentially avoidable suffering.

Limitations

As limitations to the study, we found a low response rate between the test phase and the retest, however, we exceeded the data from the original validation of the questionnaire by more than 100% (Manworren, 2001).

Conclusions

The Spanish version of the PKNAS is a valid tool to determine the knowledge and attitudes about pain of nursing professionals and thus be able to focus future training actions in areas in which a low level of knowledge is detected.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.pmn.2022.09.007.

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Please cite this article as: D. Zuazua-Rico, A. Maestro-Gonzalez, C. Cano-García et al., Spanish Validation of Pediatric Nurses Knowledge and Attitudes Survey Regarding Pain, Pain Management Nursing, https://doi.org/10.1016/j.pmn.2022.09.007