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Original Article

Spanish Version of the Knowledge and Attitudes Survey Regarding Pain

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ABSTRACT

A variety of valid tools are available to assess staff knowledge and attitudes regarding pain, among which is the Knowledge and Attitudes Survey Regarding Pain. Although this instrument has been widely and successfully used, a valid and adapted Spanish version is yet to be developed. The purpose of this study was to validate the Spanish version of the Knowledge and Attitudes Survey Regarding Pain. After translating and back-translating this tool, we conducted a cross-cultural adaptation and construct validation with 102 participants, including nursing professionals (in palliative care, oncology, and intensive care) from five health centers and final-year nursing students. All participants were recruited in the Principality of Asturias, Spain. We also evaluated the internal consistency and test-retest correlations. Cronbach's α was .781, and Pearson's r and the intraclass correlation coefficient between the test and retest scores were .881 and .883, respectively. The mean questionnaire scores in the test and retest phases were 65.8% and 67.6%, respectively. Palliative care nurses had the highest score, 70.8%, which differed significantly from the rest of the groups. The Spanish version of the Knowledge and Attitudes Survey Regarding Pain can effectively differentiate nursing staff in terms of their pain expertise. The results indicate that Spanish nurses have a gap in pharmacologic knowledge that is comparable to that found in other countries, but their foundation in general pain concepts was solid.

Inappropriate pain management is known to lead to increases in health care costs and can have a negative impact on individuals' quality of life and even increase the risk of mortality (Dale et al., 2013; Robinson et al., 2008; Yamashita, Yamasaki, Matsuyama, & Amaya, 2017). Nowadays, pain management and relief are often considered the responsibilities of health care professionals who are in contact with suffering individuals (Dunwoody, Krenzischek, Pasero, Rathmell, & Polomano, 2008; Loeser, Butler, Chapman, Turk, & Bonica, 2003; Mosteiro Díaz & Graván Fernández, 2010). Nurses play a particularly crucial role in this regard because they normally spend much of their time with patients and establish a more intimate contact.

However, multiple studies in different countries and hospital settings have found that nurses tend to have relatively little knowledge of general pain concepts, pain evaluation, and correct treatment approaches (Al Qadire & Al Khalaileh, 2014; Eid, Manias, Bucknall, & Almazrooa, 2014; Erkes, Parker, Carr, & Mayo, 2001; Kubecka, Simon, & Boettcher, 1996; Latina et al., 2015; Martín et al., 2012; Salvadó-Hernández et al., 2009; Yildirim, Cicek, & Uyar, 2008). Other studies have reported the benefits of educational efforts in this field, particularly in the improvement of assessment and management of general pain (de Rond et al., 2000; Erkes et al., 2001; Keen et al., 2017; Machira, Kariuki, & Martindale, 2013; Schreiber et al., 2014; Zhang et al., 2008).

Ferrell and McCaffery developed the Knowledge and Attitudes Survey Regarding Pain (KASRP) in 1987 (Ferrell & McCaffery, 2014) to identify weaknesses in professionals' education regarding pain in order to improve their knowledge. In Europe the Greek version of the KASRP was validated in 2002 (Tafas, Patiraki, McDonald, & Lemonidou, 2002), the Italian version in 2006 (Catania et al., 2006), and the Icelandic version in 2011 (Gretarsdottir, Zoëga, Tomasson, & Gunnarsdottir, 2011). However, the KASRP has not been validated in Spain to date.

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Table 1
Sociodemographic Characteristics

	Students (n = 31) 30.4%	Intensive Care (n = 30) 29.4%	Oncology (n = 20) 19.6%	Palliative Care (n = 21) 20.6%
Age, M (SD)	25.8 (6.4)	40.4 (6.6)	38.1 (8.0)	46.2 (11.4)
Gender	3 men	4 men	3 men	1 male
	28 women	26 women	17 women	20 women
Academic degree	—	25 Bachelor	15 Bachelor	15 Bachelor
		5 Master	5 Master	6 Master
Years of professional experience, M (SD)	—	17.2 (6.5)	12.8 (7.4)	22.1 (10.9)
Work shifts	—	30 rotating	11 rotating	12 rotating
			9 fixed shift	9 fixed shift

M = mean; SD = standard deviation.

The KASRP comprises 39 items, 22 of which are true-or-false questions, 15 are multiple-choice questions, and 2 are clinical case studies with 2 questions each. This instrument has been used successfully and repeatedly over the years in various studies throughout the world because it is freely available for use and is based on the recommendations on analgesia by the World Health Organization, American Pain Society, and National Comprehensive Cancer Network Pain Guidelines (American Pain Society, 2016; Swarm, Gafford, & Rabow, 2018; World Health Organization, 2012).

In its original version, the construct validity was established by comparing the scores of nurses with various levels of expertise (i.e., students, newly graduated students, oncology nurses, and senior pain experts). Internal consistency (Cronbach's $\alpha > .70$) and test-retest reliability ($r > .80$) were also established for both the knowledge and attitude domains. However, the original authors recommended an analysis of the full scale (where the percentage of correct answers is calculated) without consideration of these separate domains because some questions mix both aspects (Ferrell & McCaffery, 2014). When the KASRP was originally developed, no pass mark was determined; however, in later studies, a passing score of 80% was set: If a nurse scored less than 80%, his or her ability to care for a patient experiencing pain was considered to be significantly compromised (McCaffery & Robinson, 2002). Moreover, the authors also allowed for modification of the questionnaire to better suit the needs of the particular service or institution.

The purpose of the study was to validate the Spanish version of the Knowledge and Attitudes Survey Regarding Pain to faithfully illustrate its psychometric properties. We did not modify the questionnaire, in order to get a comprehensive support tool to measure Spanish nursing pain knowledge.

Methods

Design

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

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 Validation

A translation and back-translation of the original version of the questionnaire according to an adaption of Brislin's model (Jones, Lee, Phillips, Zhang, & Jaceldo, 2001) was performed by six bilingual translators who had knowledge of health care to ensure a correct interpretation of terms; no modifications to the items were made. In the first step, the original document was sent to two translators. These translators each produced Spanish versions, which were subsequently sent to two different translators for back-translation (thus resulting in two new English-language questionnaires). All four translators then met to consolidate both versions by clarifying terms and give meaning to items that might be unclear in Spanish. Once a common document was obtained through consensus, two new bilingual translators conducted another round of translation and back-translation. Finally, all six translators met to fine tune the meaning of the final items. Using this version, we conducted a pretest with 10 health care professionals (5 doctors and 5 nurses) to evaluate and obtain semantic and cultural equivalence.

To ensure that the target population fully understood the KASRP, we slightly modified item 16 because the medication it cited was not available in Spain (Vicodin, the brand name for the combination of hydrocodone 5 mg and acetaminophen 300 mg). We contacted the Pharmacy Department of Hospital Universitario Central de Asturias to find an equivalent therapy in the Spanish market from a pharmacist's perspective. After this consultation, we chose a combination of tramadol 37.5 mg and acetaminophen 325 mg, which in Spain is known by the trade name Zaldiar, among others.

Construct Validity and Reliability

We evaluated the test-retest reliability by distributing 140 copies of the final Spanish version of the KASRP (Appendix A) to three nursing professional groups (oncology, palliative care, and intensive care) from five institutions belonging to the health care network of the Principality of Asturias, as well as to final-year nursing students at the University of Oviedo. Construct validity

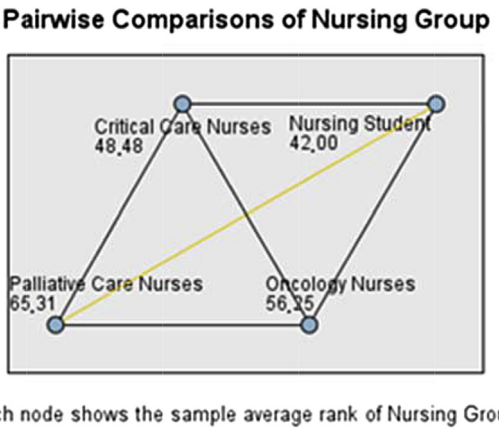

Figure 1. Post hoc analysis of differences of the Knowledge and Attitudes Survey Regarding Pain scores between nursing groups.

Table 2
Post Hoc Analyses of Differences of the Knowledge and Attitudes Survey Regarding Pain Scores (N = 102)

Sample 1–Sample 2	Test Statistic	SE	Standard Test Statistic	Sig.	Adj. sig.
Nursing students–critical care nurses	−6.483	7.551	−0.859	.391	1.000
Nursing students–oncology nurses	−14.250	8.456	−1.685	.092	.0552
Nursing students–palliative care nurses	−23.310	8.333	−2.797	.005	.031
Critical care nurses–oncology nurses	−7.767	8.511	−0.912	.362	1.000
Critical care nurses–palliative care nurses	−16.826	8.389	−2.006	.045	.269
Oncology nurses–palliative care nurses	−9.060	9.212	−0.983	.325	1.000

SE = standard error; Sig. = significance; Adj. = adjusted.
Note. 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.

was evaluated by discriminating validity, which shows differences between extreme groups. The survey was conducted between April and June 2017. The retest phase was conducted after an interval of 10-14 days to avoid memory bias. In addition to the KASRP, we collected data on age, gender, academic degree, years of nursing experience, and work shift type.

Permissions and Ethics

Regional Ethical Committee permission (No. 115/17) and written consents of all the institutions involved in the study were taken. The research team contacted all participating nurses, and informed consent was obtained from each participant after a full explanation of the study's purpose and nature was provided in a sealed envelope along with the questionnaire. To preserve their anonymity, they placed the survey back in the sealed envelope after completing it.

Statistical Analysis

We calculated the KASRP score by assigning a score of 1 to correctly answered questions and a score of 0 to incorrectly answered or unanswered questions. We then calculated the total percentage of correct answers in the questionnaire, without consideration of these separate domains. After the normal distribution of each variable had been assessed by the Kolmogorov-Smirnov test, the Kruskal-Wallis H test was used to compare KASRP scores according to demographic data and participant groups because of violation of normality assumption. We conducted post hoc analyses using the Tukey test. Statistically significant differences were indicated by $p < .05$.

The internal consistency and test-retest correlations were also assessed to evaluate the psychometric properties of the KASRP and facilitate comparison of our findings with those of the original and European versions of the tool. The data analysis was conducted using SPSS Statistics Version 22.

Results

A total of 102 questionnaires (72.8%) were completed at both the test and retest phases of the study. The sociodemographic characteristics of the respondents are shown in Table 1.

Internal Consistency

Cronbach's α of the Spanish version of the KASRP was .781.

Test-Retest Correlation

We calculated Pearson's correlation between the test and retest phase scores, which yielded a value of $r = .884$ ($p < .001$). We also calculated the intraclass correlation coefficient to ensure greater accuracy of the reliability, which yielded a value of .883 (95% confidence interval = .812-.928).

Descriptive Statistics and Construct Validity

The overall mean percentage of correct answers was 65.8% (standard deviation [SD] = 9.7) for the test phase and 67.6% (SD = 10.1) for the retest phase. The comparison of the different participant groups revealed that the palliative care group scored higher (70.8%, SD = 9.2) than did the oncology (67.3%, SD = 7), intensive care (64.7%, SD = 9.2), and student (62.4%, SD = 10.8) groups. The Kruskal-Wallis H test revealed significant group differences ($p < .034$), and post hoc testing revealed that the palliative care group and students group differed significantly ($p < .031$), as shown in Figure 1 and Table 2. We did not find significant differences in KASRP scores by gender, academic degree, age, or work shift, as shown in Table 3. When examining the responses to each item, we found that 13 items had scores <50% and 15 items had scores >80%, as shown in Table 4.

Discussion

The results of the Spanish KASRP version were similar to those of the original version. In fact, the internal consistency was greater than that of the original English survey (Cronbach's $\alpha > .70$) (Ferrell & McCaffery, 2014), positioning it among the Greek, Italian, and Icelandic versions (.88, .69, and .75, respectively) (Catania et al., 2006; Gretarsdottir et al., 2011; Tafas et al., 2002). The test-retest

Table 3
Relationships between KASRP and the Demographic Variables

Variable	Options	Mean	*p*
Gender	Men	27.73	.693
	Women	26.88	
Age group	18-30 years old	26.03	.054
	31-50 years old	27.00	
	>51 years old	30.50	
Academic degree	Bachelor	27.36	.278
	Master	28.00	
Work shifts	Fixed Shift	28.66	.123
	Rotating	27.04	
Years of professional experience	1-5 years	27.80	.742
	6-10 years	27.58	
	11-15 years	27.37	
	16-20 years	27.20	
	21-25 years	25.17	
	26-30 years	28.43	
	>30 years	30.00	
Professional group	Student	25.58	.034
	Intensive care	26.53	
	Oncology	27.60	
	Palliative care	29.05	

KASRP = Knowledge and Attitudes Survey Regarding Pain.

Table 4
Frequency Distribution

Item No.	Question (Correct Answer)	Correct Responses	
		n	%
True or false questions			
1	Vital signs are always reliable indicators of the intensity of a patient's pain. (False)	82	80.4
2	Because their nervous system is underdeveloped, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences. (False)	65	63.7
3	Patients who can be distracted from pain usually do not have severe pain. (False)	59	57.8
4	Patients may sleep in spite of severe pain. (True)	26	25.5
5	Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. (False)	47	46.1
6	Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. (True)	50	49
7	Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent. (True)	90	88.2
8	The usual duration of analgesia of 1–2 mg morphine IV is 4–5 hours. (False)	21	20.6
9	Opioids should not be used in patients with a history of substance abuse. (False)	70	68.6
10	Elderly patients cannot tolerate opioids for pain relief. (False)	97	95.1
11	Patients should be encouraged to endure as much pain as possible before using an opioid. (False)	101	99
12	Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the assessment of the parent's child's pain intensity. (False)	102	100
13	Patients' spiritual beliefs may lead them to think pain and suffering are necessary. (True)	100	98
14	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response. (True)	99	97.1
15	Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. (False)	68	66.7
16	Zaldiar (Tramadol 37.5 mg + acetaminophen 325 mg) PO is approximately equal to 5-10 mg of morphine PO. (True)	38	37.3
17	If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain. (False)	41	40.2
18	Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. (False)	72	70.6
19	Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment. (True)	56	54.9
20	Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. (True)	87	85.3
21	The term “equianalgesia” means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief. (True)	98	96.1
22	Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression. (True)	92	90.2
Multiple choice questions			
23	The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is. (Oral)	58	56.9
24	The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is. (Intravenous)	77	75.5
25	Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? (Morphine)	54	52.9
26	A 30 mg dose of oral morphine is approximately equivalent to. (Morphine 10 mg IV)	67	65.7
27	Analgesics for postoperative pain should initially be given. (Around the clock on a fixed schedule)	98	96.1
28	A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is. (Less than 1%)	34	33.3
29	The most likely reason a patient with pain would request increased doses of pain medication is. (The patient is increased pain)	98	96.1
30	Which of the following is useful for treatment of cancer pain? (All of the above)	76	74.5
31	The most accurate judge of the intensity of the patient's pain is. (The patient)	101	99
32	Which of the following describes the best approach for cultural considerations in caring for patients in pain. (Patients should be individually assessed)	94	92.2
33	How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? (5%-15%)	39	38.2
34	The time to peak effect for morphine given IV is. (15 min.)	82	80.4
35	The time to peak effect for morphine given orally is. (1-2 hours)	64	62.7
36	Following abrupt discontinuation of an opioid, physical dependence is manifested by the following. (Sweating, yawning, diarrhea and agitation…)	32	31
37	Which statement is true regarding opioid-induced respiratory depression. (Obstructive sleep apnea is an important risk factor)	50	49
Case studies			
38A	Case study: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record, you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain. (8)	30	29.4
38B	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, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is “morphine IV 1-3 mg q1h PRN pain relief.” Check the action you will take at this time. (Morphine 3 mg IV now)	19	18.6
39A	Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain: (8)	70	68.6
39B	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, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is “morphine IV 1-3 mg q1h PRN pain relief.” Check the action you will take at this time. (Morphine 3 mg IV now)	47	46.1

NSAID = nonsteroidal anti-inflammatory drug; IV = intravenously; BP = blood pressure; HR = heart rate; R = respirations; PRN = pro re nata (as needed).

correlation was also greater than that of the original version ($r > .80$), which again positions the Spanish version among the Greek and Italian versions (.69 and .97, respectively). Although we have no data available with regard to the intraclass correlation coefficient, the values obtained in this study reflect excellent reliability.

We also found that group differences were similar to the validated Italian version of the survey (Catania et al., 2006) and allow for clear discrimination between levels of pain-related expertise (Catania et al., 2006; Gretarsdottir et al., 2011). This supports the overall purpose of the KASRP. Unfortunately, we could not compare the intensive care group with these previous studies because the previous authors used other professional groups. The higher score of the palliative care group compared with the other groups (particularly the student group, with which the difference was significant) seems logical, given their greater proximity to end-of-life situations and focus on providing relief in difficult situations. The other groups might also lack education and experience at a professional technical level and, in the case of students, in emotional management.

We found higher KASRP scores than those of previous surveys conducted in other countries, such as Italy, Greece, Taiwan, Saudi Arabia, or China (Eid et al., 2014; Kiekkas et al., 2015; Lai et al., 2003; Latina et al., 2015; Samarkandi, 2018; Zhang et al., 2008), and the scores in our study were essentially the same as those found in samples from the United States and Iceland (Gretarsdottir, Zoëga, Tomasson, Sveinsdottir, & Gunnarsdottir, 2017; Kubecka et al., 1996). However, our scores were lower than those found in more recent studies conducted in the United States (Al-Shaer, Hill, & Anderson, 2011; Keen et al., 2017). Furthermore, none of the participants reached the minimum standard of correct answers of 80%, which indicated a general lack of education in pain.

The oncology group in this study had a higher KASRP score than that of the same group in studies conducted in other countries such as Turkey, Saudi Arabia, or Italy (Alqahtani & Jones, 2015; Bernardi, Catania, & Tridello, 2007; Yildirim et al., 2008), which is the same as found in Iran (Shahriary et al., 2015) and lower than in Norway (Utne, Småstuen, & Nyblin, 2018). Compared with students from Jordan, the student group had a higher score (Al-Khawaldeh, Al-Hussami, & Darawad, 2013), although our group had a similar score to that of students in the United States (Plaisance & Logan, 2006). As for the intensive care group, our results were lower than those obtained in other studies conducted in the United States, where a similar population of such nursing professionals had a mean score of 72.9% (Erkes et al., 2001), although a modified version of the survey was used.

As for the relationship between the KASRP and the assessed sociodemographic variables, the results of this study were consistent with those conducted in Italy, Greece, and the United States, where there was no relationship found between KASRP scores and age, academic degree, or professional experience (Erkes et al., 2001; Kiekkas et al., 2015; Latina et al., 2015). However, studies carried out in Turkey, Holland, Taiwan, and Iceland, and other studies conducted in the United States, found a statistically significant correlation between professional experience/academic degree and KASRP scores (Al-Shaer et al., 2011; Brunier, Carson, & Harrison, 1995; de Rond et al., 2000; Gretarsdottir et al., 2017; Lai et al., 2003; Yildirim et al., 2008). These discrepancies render the results inconclusive; thus, further studies are necessary to objectively address this question.

Items for which the correct answer rate did not reach 50% mainly related to pharmacologic concepts, which is consistent with a previous finding (Bernardi et al., 2007). In Spain, medications are prescribed by doctors, which is probably why nurses obtained lower scores. Furthermore, this indicates a need for further education about these concepts for nurses. The item that related to assessing a smiling patient's pain also had a lower score, both in terms of pain interpretation and therapeutic choice, which was in agreement with other studies that found nursing staff tend to underestimate it (Bernardi et al., 2007; Lai et al., 2003; Salvadó-Hernández et al., 2009; Yildirim et al., 2008). This could be related to a phenomenon of desensitization (Holl & Carmack, 2015; Manias, Bucknall, & Botti, 2005) or to a traditional view of pain as having only diagnostic value. Accordingly, a more specific study on this subject might be necessary. Moreover, participants had adequate knowledge of general concepts, with many of these items having a correct answer rate >80%.

Limitations

The results of this study must be interpreted within the context of the sample. That is, the findings cannot be extrapolated to other populations because of the specificity of the sample. Nevertheless, the Spanish version of the KASRP is a valid tool for focusing educational efforts on specific areas and will contribute to improving pain management.

Conclusions

The Spanish version of the KASRP is a valid and reliable tool for comprehensively measuring nursing staff's knowledge and attitudes regarding pain. This instrument can effectively discriminate between levels of expertise. This tool will help in providing a clear picture of where the educational gaps are and might simultaneously facilitate the channeling of activities to where they are most needed. Our findings highlight the need to provide more education on pain management during basic and continuing education for nurses.

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Supplementary Data

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.pmn.2018.12.007.

References

Al Qadire, M., & Al Khalaileh, M. (2014). Jordanian nurses knowledge and attitude regarding pain management. *Pain Management Nursing, 15*(1), 220–228.

Al-Khawaldeh, O. A., Al-Hussami, M., & Darawad, M. (2013). Knowledge and attitudes regarding pain management among Jordanian nursing students. *Nurse Education Today, 33*(4), 339–345.

Alqahtani, M., & Jones, L. K. (2015). Quantitative study of oncology nurses' knowledge and attitudes towards pain management in Saudi Arabian hospitals. *European Journal of Oncology Nursing, 19*(1), 44–49.

Al-Shaer, D., Hill, P. D., & Anderson, M. A. (2011). Nurses' knowledge and attitudes regarding pain assessment and intervention. *Medsurg Nursing, 20*(1), 7.

American Pain Society. (2016). *Principles of analgesic use* (7th ed.). Chicago: American Pain Society.

Bernardi, M., Catania, G., & Tridello, G. (2007). Knowledge and attitudes about cancer pain management: A national survey of Italian hospice nurses. *Cancer Nursing, 30*(2), E20–E26.

Brunier, G., Carson, M. G., & Harrison, D. E. (1995). What do nurses know and believe about patients with pain? Results of a hospital survey. *Journal of Pain and Symptom Management, 10*(6), 436–445.

Catania, G., Costantini, M., Lambert, A., Luzzani, M., Marceca, F., Tridello, G., Boni, L., & Bernardi, M. (2006). [Testing an instrument measuring Italian nurses' knowledge and attitudes regarding pain]. *Assistenza Infermieristica e Ricerca: AIR, 25*(3), 149–156.

Dale, C. R., Bryson, C. L., Fan, V. S., Maynard, C., Yanez, N. D., & Treggiari, M. M. (2013). A greater analgesia, sedation, delirium order set quality score is associated with a decreased duration of mechanical ventilation in cardiovascular surgery patients. *Critical Care Medicine, 41*(11), 2610–2617.

de Rond, M. E., de Wit, R., van Dam, F. S., van Campen, B. T. M., den Hartog, Y. M., & Klievink, R. M. (2000). A pain monitoring program for nurses: Effects on nurses' pain knowledge and attitude. *Journal of Pain and Symptom Management, 19*(6), 457–467.

Dunwoody, C. J., Krenzischek, D. A., Pasero, C., Rathmell, J. P., & Polomano, R. C. (2008). Assessment, physiological monitoring, and consequences of inadequately treated acute pain. *Pain Management Nursing, 9*(1), 11–21.

Eid, T., Manias, E., Bucknall, T., & Almazrooa, A. (2014). Nurses' knowledge and attitudes regarding pain in Saudi Arabia. *Pain Management Nursing, 15*(4), e25–e36.

Erkes, E. B., Parker, V. G., Carr, R. L., & Mayo, R. M. (2001). An examination of critical care nurses' knowledge and attitudes regarding pain management in hospitalized patients. *Pain Management Nursing, 2*(2), 47–53.

Ferrell, B., & McCaffery, M. (2014). Knowledge and Attitudes Survey Regarding Pain. Retrieved from http://prc.coh.org/Knowldege%20%20&%20Attitude%20Survey%207-14.pdf.

Gretarsdottir, E., Zoëga, S., Tomasson, G., & Gunnarsdottir, S. (2011). Psychometric properties of the Icelandic version of the Knowledge and Attitudes Survey Regarding Pain (K&A-SRP). *The Icelandic Journal of Nursing, 87*(4), 41–45.

Gretarsdottir, E., Zoëga, S., Tomasson, G., Sveinsdottir, H., & Gunnarsdottir, S. (2017). Determinants of knowledge and attitudes regarding pain among nurses in a university hospital: A cross-sectional study. *Pain Management Nursing, 18*(3), 144–152.

Holl, R. M., & Carmack, J. (2015). Complexity of pain, nurses knowledge, and treatment options. *Holistic Nursing Practice, 29*(6), 377–380.

Jones, P. S., Lee, J. W., Phillips, L. R., Zhang, X. E., & Jaceldo, K. B. (2001). An adaptation of Brislin's translation model for cross-cultural research. *Nursing Research, 50*(5), 300–304.

Keen, A., McCrate, B., McLennon, S., Ellis, A., Wall, D., & Jones, S. (2017). Influencing nursing knowledge and attitudes to positively affect care of patients with persistent pain in the hospital setting. *Pain Management Nursing, 18*(3), 137–143.

Kiekkas, P., Gardeli, P., Bakalis, N., Stefanopoulos, N., Adamopoulou, K., Avdulla, C., Tzourala, G., & Konstantinou, E. (2015). Predictors of nurses' knowledge and attitudes toward postoperative pain in Greece. *Pain Management Nursing, 16*(1), 2–10.

Kubecka, K. E., Simon, J. M., & Boettcher, J. H. (1996). Pain management knowledge of hospital-based nurses in a rural Appalachian area. *Journal of Advanced Nursing, 23*(5), 861–867.

Lai, Y. H., Chen, M. L., Tsai, L. Y., Lo, L. H., Wei, L. L., Hong, M. Y., Hsiu, L. N., Hsiao-Sheen, S. T., Chen, S. C., Kao, C. C., Huang, T. W., Chang, S. C., Chen, L., & Guo, S. L. (2003). Are nurses prepared to manage cancer pain? A national survey of nurses' knowledge about pain control in Taiwan. *Journal of Pain and Symptom Management, 26*(5), 1016–1025.

Latina, R., Mauro, L., Mitello, L., D'Angelo, D., Caputo, L., De Marinis, M. G., Sansoni, J., Fabriani, L., & Baglio, G. (2015). Attitude and Knowledge of Pain Management among Italian nurses in hospital settings. *Pain Management Nursing, 16*(6), 959–967.

Loeser, J. D., Butler, S. H., Chapman, C. R., Turk, D. C., & Bonica, J. J. (2003). *Bonica terapeútica del dolor.* México: McGraw-Hill.

Machira, G., Kariuki, H., & Martindale, L. (2013). Impact of an educational pain management programme on nurses' pain knowledge and attitudes in Kenya. *International Journal of Palliative Nursing, 19*(7), 341–345.

Manias, E., Bucknall, T., & Botti, M. (2005). Nurses' strategies for managing pain in the postoperative setting. *Pain Management Nursing, 6*(1), 18–29.

Martín, M., Losa Iglesias, M., Silva do Rosario, T., Salvadores Fuentes, P., Gómez-Arnáu, J. I., Casas Martínez, F., García-Martínez, R., & Altieri, P. (2012). Grado de conocimientos y actitudes de la enfermería de la Comunidad Autónoma de Madrid (CAM) ante el dolor: Diplomados en enfermería y profesionales. *Revista de la Sociedad Española del Dolor, 19*(6), 293–300.

McCaffery, M., & Robinson, E. S. (2002). Your patient is in pain—here's how you respond. *Nursing, 32*(10), 36–45.

Mosteiro Díaz, M. P., & Graván Fernández, C. (2010). *Dolor y cuidados enfermeros.* Madrid: Difusión Avances de Enfermería.

Plaisance, L., & Logan, C. (2006). Nursing students' knowledge and attitudes regarding pain. *Pain Management Nursing, 7*(4), 167–175.

Robinson, B. R. H., Mueller, E. W., Henson, K., Branson, R. D., Barsoum, S., & Tsuei, B. J. (2008). An analgesia–delirium–sedation protocol for critically ill trauma patients reduces ventilator days and hospital length of stay. *The Journal of Trauma: Injury, Infection, and Critical Care, 65*(3), 517–526.

Salvadó-Hernández, C., Fuentelsaz-Gallego, C., Arcay-Veira, C., López-Meléndez, C., Villar-Arnal, T., & Casas-Segala, N. (2009). Conocimientos y actitudes sobre el manejo del dolor por parte de las enfermeras de unidades de cirugía y oncología de hospitales de nivel iii. *Enfermería Clínica, 19*(6), 322–329.

Samarkandi, O. A. (2018). Knowledge and attitudes of nurses toward pain management. *Saudi Journal of Anaesthesia, 12*(2), 220–226.

Schreiber, J. A., Cantrell, D., Moe, K. A., Hench, J., McKinney, E., Preston Lewis, C., Weir, A., & Brockopp, D. (2014). Improving knowledge, assessment, and attitudes related to pain management: Evaluation of an intervention. *Pain Management Nursing, 15*(2), 474–481.

Shahriary, S., Shiryazdi, S. M., Shiryazdi, S. A., Arjomandi, A., Haghighi, F., Vakili, F. M., & Mostafaie, N. (2015). Oncology nurses knowledge and attitudes regarding cancer pain management. *Asian Pacific Journal of Cancer Prevention, 16*(17), 7501–7506.

Swarm, R. A., Gafford, E., & Rabow, M. W. (2018). NCCN guidelines index table of contents discussion. Retrieved from https://www.nccn.org/professionals/physician_gls/default.aspx.

Tafas, C. A., Patiraki, E., McDonald, D. D., & Lemonidou, C. (2002). Testing an instrument measuring Greek nurses' knowledge and attitudes regarding pain. *Cancer Nursing, 25*(1), 8–14.

Utne, I., Småstuen, M. C., & Nyblin, U. (2018). Pain knowledge and attitudes among nurses in cancer care in Norway. *Journal of Cancer Education*.

World Health Organization. (2012). Scoping document for WHO Guidelines for the pharmacological treatment of persisting pain in adults with medical illnesses. Retrieved from http://www.who.int/medicines/areas/quality_safety/Scoping_WHO_GLs_PersistPainAdults_webversion.pdf?ua=1.

Yamashita, A., Yamasaki, M., Matsuyama, H., & Amaya, F. (2017). Risk factors and prognosis of pain events during mechanical ventilation: a retrospective study. *Journal of Intensive Care, 5*(1).

Yildirim, Y. K., Cicek, F., & Uyar, M. (2008). Knowledge and attitudes of Turkish Oncology nurses about cancer pain management. *Pain Management Nursing, 9*(1), 17–25.

Zhang, C.-H., Hsu, L., Zou, B.-R., Li, J.-F., Wang, H.-Y., & Huang, J. (2008). Effects of a pain education program on nurses' pain knowledge, attitudes and pain assessment practices in China. *Journal of Pain and Symptom Management, 36*(6), 616–627.