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Original Article

Validation of the Spanish Version of the Pain Assessment in Advanced Dementia Scale (PAINAD-Sp) in Hospitalized Patients with Neurologic Disorders and Oncologic Patients Unable to Self-Report Their Pain

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ABSTRACT

Background: Pain has a significant impact on hospitalized patients and is a quality indicator for nursing care. The Pain Assessment in Advanced Dementia (PAINAD) scale measures pain in people with communication disorders and advanced dementia, but it has not been validated in any other population.
Aims: The aim of this study was to validate the Spanish version (PAINAD-Sp) in hospitalized patients with neurologic disorders and in end-of-life cancer patients with difficulty self-reporting.
Design: The study had two phases: (1) analysis of the content by a committee of experts and (2) a cross-sectional study.
Settings: We collected phase 2 data from January 2017 to December 2017 in four hospitals in Barcelona: Hospital Germans Trias i Pujol, Institut Català d'Oncologia, Hospital Vall d'Hebron, and Hospital de Bellvitge.
Participants/Subjects: We included all adults who had either a neurological disorder affecting language or an oncological disease with an end-of-life prognosis and difficulty self-reporting pain. We excluded patients with a diagnosis of dementia.
Methods: The cross-sectional study included 325 patients who were simultaneously evaluated by two observers both at rest and in movement. We analyzed psychometric properties in terms of construct validity, reliability, and sensitivity to change.
Results: We obtained Cronbach $\alpha > .70$ in both situations and an inter-rater reliability of 0.80. Confirmatory factor analysis indicated that the model adjusted adequately to a unidimensional structure. In

The study was approved by the Clinical Investigation Ethics Committee of the Hospital Germans Trias i Pujol, Institut Català d'Oncologia, Hospital Vall d'Hebron and Hospital Universitari Bellvitge. The participants were informed about the authorship and purpose of the investigation and were ensured that all the data obtained would remain anonymous and confidential.

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terms of sensitivity to change, the mean difference was greater in movement than at rest (difference in means was 1.15).
Conclusions: The PAINAD-Sp_Hosp scale had good psychometric qualities in terms of validity and reliability in neurology and oncology patients unable to self-report pain.

Pain has a great impact on health, function, and quality of life (Langley, 2011). Multidimensional, complex, and subjective (Herr, Coyne, McCaffery, Manworren & Merkel, 2011; Merskey & Bogduk, 2012), pain is defined by the International Association for the Study of Pain (IASP) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Merskey & Bogduk, 2012). The American Society of Pain Quality of Care Committee has set pain as the fifth vital sign of which health care professionals need to be aware (Molony, Kobayashi, Holleran & Mezey, 2005).

Pain is a universal human experience and a very important public health problem worldwide. Although both the IASP and the World Health Organization have asserted that pain relief is a fundamental human right (Lipman, 2005), less than half of adult patients with acute or chronic pain achieve it (Imani & Safari, 2011), with implications in both the health care and socioeconomic domains (Gaskin & Richard, 2012). Despite available guidelines and efforts to improve pain management, pain remains prevalent in hospitals (Maier et al., 2010; Vallano, Malouf, Payrulet, Baños, & Catalan Research Group, 2006). In hospitals in the United States accredited by the Joint Commission, postoperative patients reported an intense degree of pain (mean [M] = 7.4; standard deviation [SD] = 2.7) (Chapman, Stevens, & Lipman, 2013).

In the clinical setting, many people in pain cannot communicate it orally, in writing, or by any other means, either for physiological or for pathological reasons (Pasero & Mccaffery, 2011). At present, the working instructions for public hospitals in Catalonia (Spain), issued by the Institut Català de la Salut (Catalan Health Institute) and the Institut Català d'Oncologia (Catalan Oncology Institute), recommend and include the Pain Assessment in Advanced Dementia (PAINAD) Scale in their nursing care plans (Juvé-Udina et al., 2013) for assessing pain in adult patients unable to self-report. The aim of the present study was to validate the Spanish version of the PAINAD scale (PAINAD-Sp) (García-Soler et al., 2014) in hospitalized patients with neurological disorders and oncological patients unable to self-report their pain.

Inpatients with Difficulty Communicating Pain

Adults with advanced dementia, newborns and infants, children who have not yet developed language, the critically ill and unconscious, people with neurologic or language-related disorders, those with an intellectual impairment, and people with terminal illnesses at the end of their life are all among the patients who are unable to report their pain.

One highly prevalent pathologic condition associated with neurologic disorders is stroke, with approximately 795,000 stroke events every year in the United States alone (Benjamin et al., 2018). Stroke survivors may present motor, sensory, and visual deficits along with language disorders such as aphasia, which produces the loss or deterioration of language as a result of lesions on the left side of the brain—the areas involved in speaking, reading, writing, and comprehension skills (Basso, Forbes, & Boller, 2013). In the acute phase of a stroke event, aphasia can affect 21%-38% of patients admitted to hospital (Elman & Bernstein-Ellis, 1999).

People at the end of their life constitute another population at risk for experiencing pain without being able to report it. Although there is no standard definition of "end of life" in the literature, one systematic review applied the concept to patients with a progressive, life-limiting disease with a survival prognosis of no more than 1 month (Hui et al., 2014). Given their functional situation—often characterized by impaired consciousness, lack of mobility, and oral intolerance—most patients who are hospitalized at the end of their life receive sedation or morphine. However, opioid treatment does not obviate the need to systematically monitor pain, and there is a need for instruments to assess pain to adjust management strategies to conform to the recommendations of the American Society for Pain Management Nursing and the Hospice and Palliative Nurses Association (Coyne, Mulvenon, & Paice, 2018).

Whether because of cognitive, developmental, or physiologic reasons or as a consequence of a medication-induced state, patients' inability to communicate pain hinders clinicians' ability to assess and control it. A number of pain studies have concluded that these populations are at greater risk for undetected pain and inadequate treatment (Herr et al., 2011; McHugh, Miller-Saultz, Wuhrman, & Kosharskyy, 2012).

Inpatient Evaluation Instruments

Health care institutions strive to meet their own goals of providing safe, high-quality care and fulfilling criteria for service quality set by accrediting organizations. Pain is one indicator for evaluating the quality of nursing care, and it forms part of the care plans prepared for inpatients (Joint Commission International, 2017).

Nursing professionals play a fundamental role in detecting and managing pain because of their frequent, close contact with patients. In line with international guidelines and recommendations, nurses should guarantee optimal pain assessment, especially in people with communication impairments (Registered Nurses' Association of Ontario, 2013; Vallerand, Musto & Polomano, 2011).

According to the literature, at present there is no recognized protocol for assessing pain in hospitalized patients with verbal and motor limitations. The scales used must be simple, with psychometric properties that have been validated in specific population and context (validity, reproducibility, and the capacity to detect change, among other measures) (Streiner, Norman, & Cairney, 2015).

One systematic review of pain assessment tools in people with cognitive impairment found only two instruments that met reliability and validity criteria across a range of studies: the PAINAD scale and the Discomfort Scale Dementia of Alzheimer (Stolee et al., 2005). Another systematic review of 12 staff-administered behavioral pain assessment tools also highlighted the PAINAD, together with the PACSLAC (Pain Assessment Checklist for Seniors with Limited Ability to Communicate), DOLOPLUS2, and ECPA (*L'échelle Comportementale pour Personnes Agées*), as the instruments with the best psychometric qualities (Zwakhalen, Hamers, & Berger,

2006). A third study, this time a meta-review, stopped short of endorsing a single pain assessment instrument, but review authors included the PAINAD among the best candidates for use (Lichtner et al., 2014).

The PAINAD was created for patients with advanced dementia who have difficulty communicating. It is based on categories and behaviors from the Face, Legs, Activity, Cry, Consolability Scale (Merkel, Voepel-Lewis, Shayevitz, & Malviya, 1997), the Discomfort Scale in patients with Advanced Dementia of the Alzheimer Type (Hurley, Volicer, Hanrahan, Houde, & Volicer, 1992), the Checklist of Nonverbal Pain Indicators (Nygaard & Garland, 2006), and the Proxy Pain Questionnaire (Fisher et al., 2002). It is a simple scale that includes five nonverbal items: breathing (independent of vocalization), negative vocalization (e.g., nonverbal expression of pain, moans, groans), facial expression, body language, and consolability (inability to be consoled). Each item is evaluated by means of an ordinal scale with three levels: 0 (absence of pain), 1 (moderate pain), and 2 (severe pain). The total score (ascending from 0 to 10) is the overall estimation of the pain experience.

Since its original publication (Warden, Hurley, & Volicer, 2003), the PAINAD has been translated and assessed for its psychometric properties in several countries: Brazil (cultural adaptation, into Brazilian Portuguese) (Pinto, Minson, Lopes, & Laselva, 2015), Spain (García-Soler et al., 2014), the United Kingdom (Jordan, Hughes, Pakresi, Hepburn, & O'Brien, 2011), China (Lin, Lin, Shyu, & Hua, 2010), the United States (DeWaters et al., 2008), Germany (Schuler et al., 2007), Italy (Costardi et al., 2007), Singapore (Leong, Chong, & Gibson, 2006), and the Netherlands (Zwakhalen, Hamers, & Berger, 2006). Most validations have been in very small samples of patients diagnosed with advanced dementia. However, it has not been validated in other populations, such as those with neurologic disorders and oncology patients unable to self-report their pain.

Methods

Design

This validation study was developed in two phases.

Phase 1: Content Validation, Pilot Testing, and Structure of the PAINAD-Sp_Hosp Scale

Content Validation. Phase 1 took place from September to December 2016.

The most commonly used procedure for validating content is the method of consensus by a committee of experts (Lynn, 1986). Although the literature does not specify the precise number of committee members who should participate, most studies recommend 5-10 (Hyrkäs, Appelqvist-Schmidlechner, & Oksa, 2003; Zamanzadeh et al., 2015). Our content validation committee involved 10 experts with research and professional experience in the field of study from various areas of specialization: a nurse, a neurologist, and a neuropsychologist from the department of neurosciences; two palliative internists and two nurses from the palliative care unit of the department of oncology; and two nurses and an anesthesiologist from the pain clinic of the anesthesiology department.

Each expert evaluated the five items of the scale in terms of clarity and relevance according to a four-point descriptive scale (1 = not appropriate, 2 = somewhat appropriate, 3 = moderately appropriate, 4 = completely appropriate). We employed a content validity index to verify that at least 80% of the consulting experts assigned a score of 3 or 4. All items received scores over this threshold: breathing (0.81), vocalization (0.87), facial expression (0.91), body language (0.82), and consolability (0.86). The committee then revised the items for breathing and body language (Table 1), which had received the two lowest scores. The final version proposed as a pain scale for patients with neurologic disorders and cancer patients unable to self-report was dubbed the PAINAD-Sp_Hosp.

Pilot Testing and Structure of the PAINAD-Sp_Hosp Scale. Following the recommendations of Warden et al. (2003), the researchers collaborating in the validation study took part in a 2-hour theoretical-practical training session.

The teaching unit of our hospital regularly collaborates with professional actors who perform clinical simulations. In our study we decided to make use of this resource to create teaching material for the practical training as a way to achieve high assessment homogeneity. We recorded one video per score and item to illustrate the scoring criteria in the five domains covered by the scale.

In addition to viewing the explanatory video, research trainees underwent a practical test. Six videos were recorded to show different clinical scenarios in which the patient would have difficulty reporting pain: two on each end of the spectrum of pain (no pain and severe pain) and four showing mild to moderate pain that involved different evaluation items (breathing, vocalization, facial expression, body language, and consolability).

Afterward a pilot test was carried out with the PAINAD-Sp_Hosp scale in 33 inpatients at the Hospital Germans Trias i Pujol and the Institut Català d'Oncologia in Badalona (Barcelona) with neurologic disorders or cancer and who were unable to self-report their pain.

Each assessment took 5 minutes. Researchers then gave feedback with regard to the adequacy of their training to prepare them for assessing pain in the patients. No changes were needed either in format or content.

Phase 2: Validation of the Psychometric Properties of the PAINAD-Sp_Hosp Scale

We collected phase 2 data from January 2017 to December 2017 in four hospitals in Barcelona: Hospital Germans Trias i Pujol, Institut Català d'Oncologia, Hospital Vall d'Hebron, and Hospital de Bellvitge.

Sample. For the confirmatory factor analysis, we followed the recommendations of Hair et al. (Hair, Black, Babin, & Anderson, 2014), who considered a sample size of 200 to be adequate in noncomplex models. Moreover, we calculated a required sample size of at least 325 with an α of .05, to detect a minimum Cronbach α coefficient of .70 at a confidence level of 95%.

Participants. We included all adults (aged $\geq$18 years) who had either a neurologic disorder affecting language or an oncologic disease with an end-of-life prognosis and difficulty self-reporting pain. All participants or their family or legal representative provided written informed consent. We excluded patients with a diagnosis of dementia.

Procedure. Each patient was assessed on a single occasion by two observers, who each completed two consecutive evaluations independently: once when the participant was at rest and then in movement. Study movement was defined as a postural change, sitting in bed, or sitting in a chair. There was no pharmacologic intervention between the two observations.

Variables and Source of Information. We recorded the score for each item and patient, along with the total score on the PAINAD-Sp_Hosp scale (0-10). We also recorded sociodemographic and clinical variables: sex, age, diagnosis, and prognosis (end-of-life or no).

Table 1
PAINAD-Sp Scale vs. PAINAD-Sp_Hosp Scale

Item	PAINAD-Sp			PAINAD-Sp_Hosp		
	0	1	2	0	1	2
Breathing (independent of verbalization-vocalization of pain)	Normal	Breathing occasionally labored Short periods of hyperventilation	Labored, noisy breathing Long periods of hyperventilation Cheyne-Stokes breathing	Normal	**Light or moderate effort in breathing, shortness of breath**	**Severe respiratory effort and/or hyperventilation**
Vocalization (negative verbalization)	Normal	Occasional moaning and groaning Speaks softly or with disapproval	Agitated, repetitive cries Loud moaning and groaning Crying	Normal	Occasional moaning and groaning Speaks softly or with disapproval	Agitated, repetitive cries Loud moaning and groaning Crying
Facial expression	Smiling or inexpressive	Sad Fearful Frowning	Grimacing with disapproval and displeasure	Smiling or inexpressive	Sad Fearful Frowning	Grimacing with disapproval and displeasure
Body language	Relaxed	Tense Walks painfully Hands don't stop moving	Rigid Clenched fists Bent knees Grabs or pushes Physical aggressiveness	Relaxed	Tense Walks painfully (NA EOL) Hands don't stop moving	Rigid Clenched fists Bent knees (NA EOL) Grabs or pushes Physical aggressiveness (NA EOL)
Consolability	No need to console	Distracted or calmed by being spoken to or touched	Impossible to console, distract, or calm	No need to console	Distracted or calmed by being spoken to or touched	Impossible to console, distract, or calm

PAINAD = Pain Assessment in Advanced Dementia; Sp = Spanish-language version; Hosp = hospitalized patients; NA = not applicable; EOL = end-of-Life situation.
In bold: elements changed from the original version.

Statistical Analysis

Data analyses were performed using SPSS for Windows Version 22 (IBM Corp., Armonk, NY, USA).

Reliability

We measured reliability by means of internal consistency using Cronbach α coefficient (Cronbach, 1951) and considering an α of .70 as acceptable (Nunnally & Bernstein, 1994).

We also calculated the corrected item-total correlation, accepting a minimum correlation of 0.30 (Clark & Watson, 1995).

We assessed inter-rater reliability using a weighted Cohen κ coefficient for each item (Cohen, 1968). This coefficient yields values between −1 and +1, with higher values indicating better inter-rater reliability (Cohen, 1960, 1968; Landis & Koch, 2008). We also calculated the intraclass correlation coefficient for the total score.

Validity

The construct validity of the PAINAD-Sp_Hosp scale was determined using confirmatory factor analysis (CFA). CFA models were estimated using structural equation modeling (EQS 6.1 for Windows, Multivariate Software, Inc., Encino, CA, USA).

To analyze the construct validity of the PAINAD-Sp_Hosp scale, we undertook a CFA using the generalized least squares method to determine whether the scores reproduced the unidimensional structure on which the original scale was based (Warden et al., 2003). This method has the same properties as the method of maximum likelihood, although under less rigorous considerations of multivariate normality because it is usually applied to items of ordinal measurement (Rial, Varela, Abalo, & Lévy, 2006). In this study we used the following global adjustment indexes: normalized χ^2, defined as the ratio of the χ^2 value and the number of degrees of freedom (χ^2/df); adjusted goodness-of-fit index (AGFI), comparative fit index, Bentler-Bonnet non-normed fit index, and root mean standard error of approximation. The criterion adopted for a good global fit was that obtained with the following adjustment values: χ^2/df between 2 and 6 (Hu & Bentler, 1998), adjusted goodness-of-fit index, comparative fit index, Bentler-Bonnet non-normed fit index > 0.95, and root mean standard error of approximation < 0.08 (Brown, 2015; Schermelleh-Engel, Moosbrugger, & Müller, 2003).

Sensitivity to Change

Sensitivity to change was analyzed by a comparison of the mean total scores for the PAINAD-Sp_Hosp scale according to whether the patient was at rest or in movement. For this analysis we used the Wilcoxon signed-rank test.

Ethical Considerations

The clinical research ethics committees of the four participating centers approved the study (CEIC PI-16-062: Hospital Germans Trias i Pujol and the Institut Català d'Oncologia; PR(AG)166/2016: Hospital Vall d'Hebron, and PR099/17: Hospital de Bellvitge). Family members or legal representatives were informed of the authorship and purpose of the research and of the confidentiality of the data. Before carrying out the study, we obtained permission to use the PAINAD-Sp scale from its authors (García-Soler et al., 2014).

Table 2
Patient Characteristics (N = 325)

	n	%
Participating Center		
Hospital de Bellvitge	36	11.1
Hospital Germans Trias	115	35.4
Hospital Vall d'Hebron	70	21.5
Institut Català d'Oncologia	104	32.0
Mean age in years	71.1 (SD 13.4)	
Sex		
Female	136	41.8
Male	189	58.2
Diagnosis		
Neurologic	197	60.6
Neurosurgic	24	7.4
Oncologic	104	32.0
End-of-life prognosis		
Yes	116	35.7
No	209	64.3

SD = standard deviation.

Table 3
Frequency Table for Items on the PAINAD-Sp_Hosp Scale, at Rest and in Movement

Item	At Rest						In Movement					
	0		1		2		0		1		2	
	n	%	n	%	n	%	n	%	n	%	n	%
Breathing	207	63.7	103	31.7	15	4.6	177	54.5	116	35.7	32	9.8
Vocalization	254	78.2	64	19.7	7	2.2	186	57.2	120	36.9	19	5.8
Facial expression	194	59.7	110	33.8	21	6.5	126	38.8	132	40.6	67	20.6
Body language	211	64.9	101	31.1	13	4.0	150	46.2	138	42.5	37	11.4
Consolability	269	82.8	46	14.2	10	3.1	229	70.5	78	24.0	18	5.5

PAINAD-Sp_Hosp = Pain Assessment in Advanced Dementia, Spanish-language version, for hospitalized patients.

Results

We included 325 inpatients admitted to the four participating centers. Table 2 presents their sociodemographic and clinical characteristics. Mean age was 71.1 years (SD 13.4), and 58.2% were men. More than half the participants (60.6%) had a neurologic diagnosis, and 32.0% had an oncological diagnosis and were in an end-of-life stage.

Item Analysis

Most participants were assessed with a score of 0 (no pain) across domains, both at rest and in movement. The items presenting scores of 1 (moderate pain) most often were breathing, facial expression, and body language (Table 3).

Reliability

The Cronbach α internal consistency coefficient for the total scale was .72 at rest and .75 in movement. We also calculated the α values, excluding each item from the scale in turn, finding that this did not improve the internal consistency of the questionnaire in a relevant way. The corrected item-total correlation was greater than 0.30 for all items (Table 4).

Inter-rater Reliability

Inter-rater reliability was good (weighted $\kappa > 0.80$) in assessments both at rest and in movement and across all items. The intraclass correlation coefficient for the total scale was 0.97 at rest and 0.98 in movement (Table 5).

Construct Validity

The standardized solution of the unifactorial model constructed is presented in Figure 1 and the global adjustment indexes in Table 6. These results are presented both for the situation of the patient at rest and the patient in movement.

The χ^2 test gave statistically significant results, but the adjustment reason was 5.74 for the at rest situation and 5.34 in movement, which fall between the values of 2 and 6 needed for a reasonably good fit (Rial et al., 2006). In addition, the other indexes of absolute fit as well as the incremental fit and the parsimony fit analyzed indicated the same tendency, so we may conclude that the model fit was adequate for both assessment situations.

Sensitivity to Change

We verified the instrument's sensitivity to change by comparing the total score obtained when the patient was in movement versus at rest, finding a statistically significant difference ($p < .001$) between observations. The mean of the differences was greater in movement than at rest (difference of means = 1.15 points).

Discussion

This study assessed the psychometric properties of the PAINAD-Sp_Hosp scale in patients hospitalized with neurologic disorders and oncologic patients unable to self-report their pain. We found the tool adequate in terms of construct validity, internal consistency, inter-rater reliability, and sensitivity to change.

Strengths of this study include its sample size, with 325 participants, and its multicenter design, with four participating hospitals. Thus the study is considerably larger than the studies used to validate the PAINAD scale in other clinical settings, which have involved 12-128 patients across the original study and in the Chinese, Italian, German, Dutch, Portuguese, and Spanish validations (Basler et al., 2006; Batalha & Duarte, 2012; Costardi et al., 2007; García-Soler et al., 2014; Lin et al., 2010; Pinto et al., 2015; Schuler et al., 2007; Warden et al., 2003; Zwakhalen et al., 2006).

In terms of reliability, the scale yielded a Cronbach α of .72 for assessments at rest and .75 in movement. These values are adequate (Nunnally & Bernstein, 1994; Waltz, Strickland, & Lenz, 2010) and higher than those obtained by Pinto et al. (2015) and Lin et al. (2010).

Some of these studies found that the Cronbach α coefficient increased on eliminating the breathing item from the scale (García-

Table 4
Internal Consistency Coefficient (Cronbach α) for the PAINAD-Sp_Hosp Scale

Items	At Rest		In Movement	
	Correlation Item Total Corrected	Cronbach α of the Scale without Item	Correlation Item Total Corrected	Cronbach α of the Scale without Item
Breathing	.36	.72	.45	.73
Vocalization	.42	.69	.58	.68
Facial expression	.52	.65	.53	.70
Body language	.57	.63	.58	.68
Consolability	.53	.65	.44	.73
α total	*.72*		*.75*	

PAINAD-Sp_Hosp = Pain Assessment in Advanced Dementia, Spanish-language version, for hospitalized patients.

Table 5
Inter-rater Agreement for the PAINAD-Sp_Hosp Scale

	At Rest		In Movement	
Item	Weighted κ	95% CI	Weighted κ	95% CI
Breathing	0.86	0.80-0.91	0.90	0.86-0.95
Vocalization	0.83	0.76-0.90	0.87	0.82-0.92
Facial expression	0.87	0.82-0.92	0.83	0.78-0.88
Body language	0.85	0.80-0.19	0.83	0.78-0.88
Consolability	0.86	0.79-0.92	0.82	0.76-0.88
	At rest		In movement	
	ICC	95% CI	ICC	95% CI
Total scale	0.97	0.96-0.97	0.98	0.97-0.98

PAINAD-Sp_Hosp = Pain Assessment in Advanced Dementia, Spanish-language version, for hospitalized patients; ICC = intraclass correlation coefficient; CI = confidence interval.

Soler et al., 2014; Lin et al., 2010) because of the difficulty in its assessment. However, in our study this was not the case, perhaps in part because this item had already been modified in the Spanish reference version (García-Soler et al., 2014) to discriminate among normal, light, moderate, and great efforts in breathing, and in part because the evaluators had received prior training for assessing this item as an indicator of pain, which could have improved the consistency.

Only a few of the studies reviewed indicate the temporal stability of the PAINAD scale. In the adaptation to Portuguese (Batalha et al., 2012), the κ coefficient for temporal stability was 0.49-0.78. The German (Basler et al., 2016; Schuler et al., 2007) and Italian (Costardi et al., 2007) versions had adequate temporal stability, with a Pearson correlation coefficient ranging from 0.88 to 0.90. Meanwhile, DeWaters et al. (2008), García-Soler et al. (2014), Lin et al. (2010), and Pinto et al. (2015) obtained intraclass correlation coefficients ranging from 0.59 to 0.88 for the total scale score. In our study both the κ value for each item and the intraclass correlation coefficient for the total scale were higher than the values found in all the other published studies at the time of writing.

No previous validation study of the PAINAD scale has included CFA. To date they have included only exploratory factor analyses, examining the main components in the original scale and in the Chinese, German, and Portuguese adaptations (Basler et al., 2006; Lin et al., 2010; Pinto et al., 2015; Schuler et al., 2007; Warden et al., 2003). The percentage of variance explained in all of these ranged from 46.5% to 63.5%, with a unifactorial scale. In our study we carried out CFA using the method of the generalized least squares with the aim of determining whether the scores reproduced the unidimensional structure underlying the original scale for assessments both at rest and in movement. In both cases, CFA indicated statistically significant values for all items and an adequate factor load. In terms of the adjustment indexes analyzed for the model, we can conclude that we have a good model fit.

Sensitivity to change was verified by comparing the mean scores of two different observations (at rest and in movement), which indicated a statistically significant difference between the two time points. These results are similar to those reported by García-Soler et al. (2014) and Lin et al. (2010).

Limitations

Our study has some limitations. First, there is an inherent problem in applying the instrument because evaluators require prior training. However, in our experience appropriate audiovisual materials can make this training straightforward and rapid.

Our study is the first to validate the PAINAD-Sp_Hosp scale in patients hospitalized with neurologic disorders and oncologic patients unable to self-report their pain. Therefore this adapted scale may not be generalizable to other population or patient groups.

Conclusions

The PAINAD-Sp_Hosp scale is a valid and reliable instrument for monitoring pain in hospitalized patients with neurologic disorders and oncologic patients unable to self-report their pain.

Implications for Nursing Education, Practice, and Research

Nurses play an important role in pain management, and their education should explore the practice of pain management in depth so that nurses are able to effectively assess their patients' pain. Reliable validated instruments are needed for neurologic and oncologic patients, who have difficulty communicating the pain they are experiencing verbally or gesturally. Validating this scale

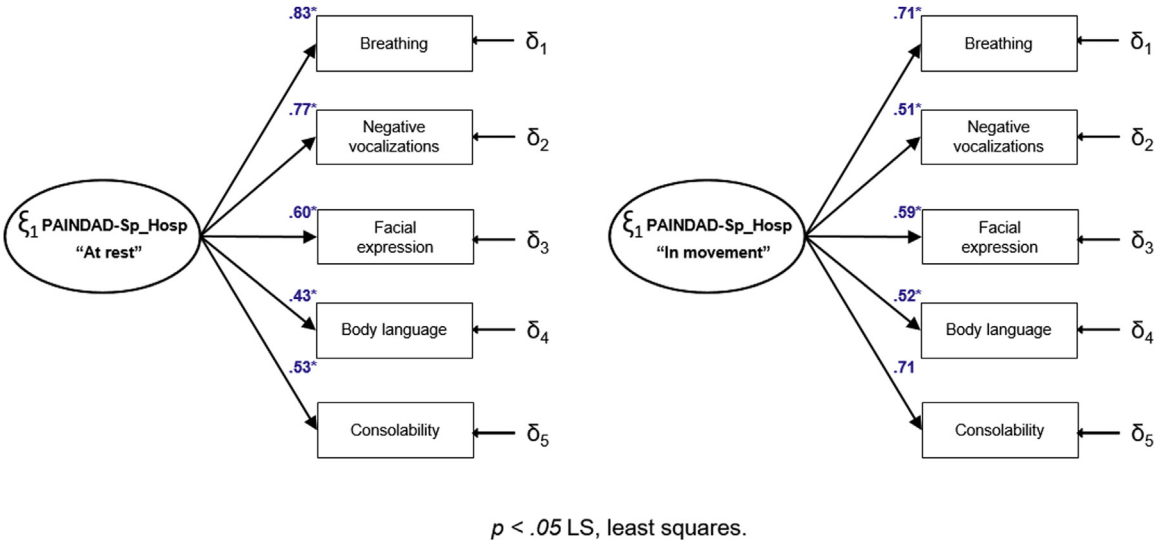

Figure 1. Factor loadings derived from the least squares (LS) estimation confirmatory factor analysis (λij). PAINAD-Sp_Hosp = Pain Assessment in Advanced Dementia, Spanish-language version, for hospitalized patients.

Table 6
Goodness of fit Indexes of the Confirmatory Model

Index	Value at Rest	Value in Movement
BBNNFI	0.94	0.97
CFI	0.97	0.98
AGFI	0.96	0.99
RMSEA	0.05	0.04
Cronbach α	.72	.75
Adjusted goodness test	$\chi^2(5) = 28.70$; $p < .001$	$\chi^2(5) = 26.74$; $p < .001$
Adjustment reason	$\chi^2/df = 5.74$ of 2-6	$\chi^2/df = 5.34$ of 2-6

BBNNFI = Bentler-Bonnet non-normed fit index; CFI = comparative fit index; AGFI = adjusted goodness of fit index; RMSEA = root mean standard error of approximation.

and implementing its use in this population would improve the quality of care, reducing the variability of clinical practice with respect to the assessment, recording, and treatment of pain.

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