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Psychometric Properties of the Spanish Version of the Pain Anxiety Symptoms Scale-20 (PASS-20-SV)

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Abstract

Background: The PASS-20 is a general measure of pain-related anxiety and fear. The aim of the present study was to adapt the questionnaire for use in Spanish-speaking populations. **Methods:** Sample 1 comprised 216 individuals with chronic spinal pain (114 women and 102 men); sample 2 comprised 85 individuals with acute spinal pain (62 women and 23 men). The dimensionality of the PASS-20-SV items was evaluated using Exploratory Factor Analysis and an optimal implementation of Parallel Analysis (robust maximum likelihood). Data from sample 1 was used to analyse internal consistency and convergent validity. Estimated test-retest stability and predictive validity were based on data from the sample 2 participants, who completed the first administration (T1) and a second administration (T2, 6 months later). **Results:** The PASS-20-SV comprises two factors: pain-related anxiety and apprehension, and pain-related fear and avoidance. It has good to excellent reliability and adequate test-retest stability. The results support its convergent and predictive validity. **Conclusions:** The Spanish Version of the PASS-20 is a valid, reliable measure of pain-related anxiety and pain-related fear in Spanish-speaking patients.

Keywords: Pain anxiety, fear of pain, PASS-20, assessment, psychometric properties.

Resumen

Propiedades Psicométricas de la Versión Española de la Pain Anxiety Symptoms Scale-20 (PASS-20-SV). **Antecedentes:** el PASS-20 es una medida general de la ansiedad y el miedo relacionados con el dolor. El objetivo del presente estudio fue adaptar el cuestionario para su uso en población española. **Método:** la muestra 1 incluyó 216 personas con dolor crónico de espalda (114 mujeres y 102 hombres); la muestra 2 comprendió 85 personas con dolor agudo de espalda (62 mujeres y 23 hombres). La estructura factorial del PASS-20-SV se evaluó mediante un análisis factorial exploratorio y un análisis paralelo (máxima verosimilitud). Los datos de la muestra 1 se utilizaron para analizar la fiabilidad y la validez convergente. La estabilidad estimada de la prueba y la validez predictiva se basaron en los datos de los participantes de la muestra 2, que completaron el instrumento en dos momentos (T1 y T2, 6 meses después). **Resultados:** la versión española del PASS-20 se compone de dos factores: ansiedad y aprehensión al dolor, y miedo y evitación del dolor, con buena consistencia interna y adecuada estabilidad. Los resultados apoyan la validez convergente y predictiva del instrumento. **Conclusiones:** la versión española del PASS-20 es una medida válida y fiable para evaluar la ansiedad y el miedo al dolor.

Palabras clave: ansiedad y miedo al dolor, PASS-20, evaluación, propiedades psicométricas.

According to the biopsychosocial model of pain, psychological factors such as pain-related anxiety contribute to the onset and progression of both pain and disability (Gatchel et al., 2007). Thus, pain-related anxiety represents the cognitive, emotional, behavioural, and physiological reactions to the anticipation and experience of pain (McCracken & Dhingra, 2002), which reflects the tendency of an individual to respond with anxiety or fear to actual or potential pain experiences (McCracken et al., 1992).

Originally, pain-related anxiety was typically assessed using the Pain Anxiety Symptoms Scale (PASS, McCracken et al., 1992), a self-report measure comprising 40 rationally derived items distributed across four components of pain-related anxiety: (a) fear of pain, (b) cognitive anxiety, (c) physiological symptoms of anxiety, and (c) escape-avoidance behaviour. A shorter 20-item version of the PASS (PASS-20) was derived from the original scale in a sample of individuals with chronic pain to make the assessment of pain-related anxiety more accessible in clinical and research settings (McCracken & Dhingra, 2002). The PASS-20 supported the four-factor model of the PASS and showed good internal consistency, criterion validity, and construct validity.

The PASS-20 has been adapted into other languages, such as Korean (Cho et al., 2010), German (Kreddig et al., 2015), and Arabic (Tashani et al., 2017). There are also two Chinese versions, which were derived from a study conducted in Hong-Kong (Wong et al., 2012) and another in Shanghai (Zhou et al., 2017). These different versions of the PASS-20 have shown appropriate internal consistency. There is also empirical evidence on the convergent and predictive validity of the PASS-20 in different pain samples. Most of these validation studies were conducted using samples of

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individuals with chronic pain, among whom low back pain was the most frequent primary pain location. A German study (Kreddig et al., 2015) included a small proportion of individuals with acute and subacute pain: however, the analyses were performed without distinguishing between these samples, and the main sample comprised individuals with chronic pain.

Even though there is evidence supporting the reliability and cross-cultural validity of the PASS-20, factor analyses across studies has yielded inconsistent findings on the number of factors and items that comprise it. Although most of the studies provide a four-factor structure, there are some exceptions. For example, the Korean version of the PASS-20 consisted of three factors but with different items included in each factor. The German PASS-20 study conducted Parallel Analysis (PA), which indicated that one factor should be retained. The Shanghai Chinese study conducted a second-order four-factor model confirmatory factor analysis of the PASS-20. The results showed that the covariation of errors of several items belonging to different factors was allowed, which would suggest an overlap between the content of these items.

Up to now, a Spanish version of the PASS-20 has not been available, although a preliminary study conducted in a Spanish sample of individuals with chronic pain patients obtained a two-factor solution (López-Martínez et al., 2011). There is a need for well-validated instruments to measure pain-related anxiety for the purposes of research and clinical interventions in Spanish-speaking populations. Therefore, the aim of this study was threefold: (1) to analyse the factor structure of the Spanish PASS-20 (PASS-20-SV), (2) to examine its reliability (internal consistency and test-retest stability), and (3) to examine its convergent, divergent, and predictive validity.

Methods

Participants

Sample 1: Chronic pain sample. The participants consisted of a consecutive sample of 216 individuals with chronic spinal pain (114 women and 102 men) who were referred by physicians and physiotherapists from primary care health centres and from a pain unit of a general hospital in Spain. Participants were eligible for the study if they met the following conditions: continuous or intermittent back pain of benign origin of at least 3 months duration, with an intensity of 3 or above on the Composed Pain Intensity Index of 10 points (Jensen et al., 1999), and which appears 5 or more days per week. Exclusion criteria were as follows: a) severe injuries that required immediate surgery, b) major psychiatric illness, c) presence of other chronic diseases involving disability, and d) insufficient knowledge of the Spanish language to understand the instructions and the questionnaires.

All participants were Caucasian. The patients' mean age was 48.50 years (*SD* = 13.61; age range = 18-78) and mean pain duration was 73.22 months (*SD* = 90.45). At the time of the study, 72 % were married or cohabiting. Regarding their work status, 40% were active workers, 28% were retired, and 8% were unemployed. In total, 68% had completed primary education, 24% had completed high school, and 8% had a university degree. All participants were Spanish.

Sample 2: Acute pain sample. This sample comprised 85 individuals with spinal pain (62 women and 23 men) who were referred by physicians from a rehabilitation service in Spain. Participants were considered suitable for the study if they had experienced continuous or intermittent spinal pain of non-oncological origin for less than 1 month and who had been free of this pain during the 6 months preceding the current episode. The exclusion criteria for this sample were the same as those described for the chronic pain participants.

All participants were Caucasian. Their mean age was 48.62 years (*SD* = 16.26; age range = 18-77) and mean pain duration was 22.41 days (*SD* = 10.81). In total, 57% were married or cohabitating, 40% were active workers, 12% were retired, and 13% were unemployed. In total, 68% had completed primary education, 23% had completed high school, and 9% had a university degree. All the participants in this sample were also Spanish.

Instruments

Pain Anxiety Symptoms Scale (PASS-20). The PASS-20 (McCracken & Dhingra, 2002) is a 20-item measure of anxiety and fear of responses associated with the experience of chronic or recurrent pain. Each item is rated on a 5-point scale from 0 (*never*) to 5 (*always*). It consists of four subscales measuring (a) cognitive anxiety responses, (b) escape and avoidance, (c) fearful thinking, and (d) physiological anxiety responses. A forward-backward translation method was used to adapt this scale to the final Spanish version. Two native Spanish speakers independently translated the material from English into formal Spanish. The translations were compared and discussed to construct the first version of the Spanish PASS-20. Subsequently, two native English speakers, who were blinded to the original English instrument, independently translated the Spanish translation back into English. This backtranslation was compared to the original English PASS-20 to assess conceptual and literal similarities.

Pain Catastrophizing Scale (PCS). The PCS (Sullivan et al., 1995) is composed of 13 items on 5-point scale, ranging from 0 (*not at all*) to 4 (*all the time*), with higher scores indicating higher levels of catastrophizing. The items describe different thoughts and feelings that individuals may experience when they are in pain. The PCS was developed to assess three components of catastrophizing: rumination, magnification, and helplessness. Only the total score of the Spanish version (Muñoz & Esteve, 2005) was used in this study. The total scale showed excellent reliability for the sample used in the present study (Cronbach's alpha = .97).

The Pain Vigilance and Awareness Questionnaire (PAVQ). The PAVQ (McCracken, 1997) was developed to measure awareness, vigilance, preoccupation, and observation of pain. The PAVQ consists of 16 items that assess two components of pain vigilance: active vigilance and passive awareness. The Spanish version (Esteve et al., 2013) shows good internal consistency, test-retest reliability, and construct validity. The total scale showed good reliability for the sample used in the present study (Cronbach's alpha = .84).

The Hospital Anxiety and Depression Scale (HADS). The HADS (Zigmond & Snaith, 1983) is a 14-item self-reporting scale comprising two 7-item Likert subscales, one for anxiety and one for depression. The Spanish version of the scale used in this study has suitable reliability and validity, and the internal consistency of both subscales is high (Quintana et al., 2003). In this study, depression and anxiety had Cronbach's alphas of .88 and .83, respectively.

The Impairment and Functioning Inventory-Revised (IFI-R). The IFI-R (Ramírez-Maestre & Esteve, 2015) was developed to measure daily functioning and pain-related disability. This scale

is a 30-item measure that assesses specific activity associated with autonomous behaviour, household activities, social relationships, and leisure in individuals with chronic pain. The participants indicate how many times they performed an activity during the previous week on a 5-point scale ranging from 0 (*never*) to 4 (*10 or more times*). Functioning and impairment were respectively calculated by summing the frequencies of each activity and the total number of activities that the participant did not perform because of pain. In this study, daily functioning had Cronbach's alphas of .91 and .83 for sample 1 and sample 2, respectively. Cronbach's alpha for pain-related impairment was .93 and .83 for samples 1 and 2, respectively.

Pain intensity. In line with the recommendations of Jensen et al. (1999), patients were asked to rate their mildest, moderate, and strongest pain during the previous week, as well as their current pain, on a scale ranging from 0 (*not at all*) to 10 (*extremely painful*). The mean of these four scores was calculated to obtain a composite pain intensity score. Cronbach's alpha for the composite score was .82 and .92 for samples 1 and 2, respectively.

Procedure

Prior to data collection, the researchers held a meeting with the participating doctors in which the eligibility criteria were explained and the procedures were decided on. At the end of their medical visit, each patient who fulfilled the eligibility criteria was informed by their doctor of the study aims and their participation was requested. Over 30% of individuals refused to participate in the study. The participants who accepted were contacted by telephone to make an appointment. Of these, none refused participation.

Participants were informed of the study aims, confidentiality was assured, and written informed consent was obtained in accordance with the Declaration of Helsinki. This study formed part of a larger research project aimed at investigating the role of key psychological variables as predictors of pain chronification (PSI2008-01803, HUM-566, P07-SEJ-3067) that was approved by the Ethics Committees of the health district to which the health centres belonged. Each participant completed a battery of questionnaires in the same order in an oral semi-structured interview format with a trained psychologist. All individuals were interviewed at their clinic. As part of the procedure of the extensive research project of which this study is a part, participants in sample 2 were invited to attend a second interview 6 months later at their clinic to complete the battery of questionnaires again.

Data analysis

The percentage of missing data was acceptable (3%). Thus, in all analyses the missing data were assumed to be missing at random and were replaced by using the multiple imputation method. As recommended in the literature (Gottschall et al., 2012; Mazza et al., 2015), data were imputed at the item level prior to computing the scale scores.

Data from sample 1 were used to analyse the factor structure of the PASS-20-SV. Descriptive statistics and the distributional properties of the items were calculated. Raw item-rest correlations were checked to identify items with relatively smaller multiple correlations with other items for possible exclusion in further analyses. The number of dimensions was assessed using indices based on PA. Thus, following the recommendations (Lloret-Segura et al., 2014) the dimensionality of the PASS-20-SV items was evaluated using an optimal implementation of PA (Timmerman & Lorenzo-Seva, 2011) using exploratory robust maximum likelihood (RML), which is indicated for small samples of around 200 subjects (Lloret-Segura et al., 2014) and an Exploratory Factor Analysis (EFA) - maximum likelihood method – . Goodness-of-fit was evaluated using the following indices: standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Non-Normed Fit Index (NNFI). Model fit was defined according to the following criteria (Hu & Bentler, 1999): an RMSEA value equal to or less than .06 indicates a good fit, .08 an acceptable fit, and equal to or more than .10 a poor fit; an SRMR value close to or less than .08 indicates an acceptable fit; and CFI and TLI values close to or more than .95 indicate an acceptable fit.

Data obtained from the first administration of the questionnaire to sample 1 participants was used as a basis to assess internal consistency (i.e. Cronbach's alpha coefficient for each of the subscales and the overall scale) and convergent validity. Convergent validity was assessed by calculating Pearson correlations between the PASS-20-SV total score and subscale scores and scores on pain catastrophizing, pain vigilance, depression and anxiety symptoms, daily functioning, pain-related impairment, and pain intensity. We followed the guidelines proposed by Evers et al. (2013) for interpreting correlations, according to which validity values can be considered inadequate ($r < .20$), adequate ($.20 \leq r < .35$), good ($.35 \leq r < .50$), or excellent ($r \geq .50$).

Test-retest stability estimates and predictive validity were based on data from sample 2 participants who completed the first and second administration (6 months later). The intraclass correlation coefficient (ICC) for test-retest reliability was calculated using baseline and 6-month post-assessment scores, with values less than .50, between .50 and .75, between .75 and .90, and values greater than .90 being indicative of poor, moderate, good, and excellent reliability, respectively (Koo & Li, 2016). The paired sample *t* test was used to examine mean differences between PASS-20-SV total scores measured at Time 1 and Time 2.

Predictive validity was assessed using three hierarchical multiple regressions on daily functioning, pain-related impairment, and pain intensity (measured at Time 2) with the PASS-20-SV total score (measured at Time 1) as the criterion variable. To control for potential confounding, age and sex (coded as man = 0 and women = 1) were entered in the first block. The PASS-20-SV total score was entered in the second block.

Statistical analyses were performed using the SPSS software version 25.0. Parallel analysis was conducted using with the FACTOR statistical programme version 10.10.02 (Lorenzo-Seva & Ferrando, 2013).

Results

Preliminary analyses

Missing values were replaced using the multiple imputation method. The remaining analyses were conducted on the imputed data set. The within-groups Mahalanobis distance showed that there were 10 multivariate outliers (Mahalanobis distance $p < .001$). Consequently, one and nine participants were eliminated from samples 1 and 2, respectively, leaving 215 participants in sample 1 (chronic pain) and 76 in sample 2 (acute pain).

Parallel analysis

The PA using exploratory RML indicated a two-factor structure. The results of the test based on χ^2 were significant ($p < .001$) but χ^2/df (268.63/133) was < .3. The RMSEA (.06), SRMR (.07), CFI (.98), and NNFI (.97) values indicate an acceptable fit.

Factor structure

The Kaiser-Meyer-Olking (KMO) index was .91. The subject-to-item ratio was 10.8:1, indicating that EFA was adequate for this sample.

The EFA analysis yielded three factors with eigenvalues > 1. However, factor 3 had only two items, which did not meet the required minimum of three to four items per factor (Lloret-Segura et al., 2014). Therefore, the EFA analysis was repeated forcing a two-factor solution.

This solution accounted for 52.56% of the variance (with factors 1 and 2 explaining 43.03 and 9.53 of the variance, respectively), and with eigenvalues of 8.11 and 1.33 for factor 1 and factor 2, respectively. All loadings were greater than .30 and communalities were between .33 and .75, except for item 8 (communality .21). Pearson correlation coefficient between factors was .67. Factor 1 consisted of 12 items measuring pain-related anxiety and Factor 2 comprised eight items measuring avoidance and cognitive responses to pain. Thus, Factor 1 was named Pain-related anxiety and apprehension, and Factor 2 was named Pain-related fear and avoidance. Table 1 shows the descriptive statistics for items and the EFA results. Item means range from 3.97 to 1.17 (items 8 and 3, respectively). All items had skewness less than ±1 except for item 8 (-1.42). All items had kurtosis more or less than zero, but there was no item with a highly leptokurtic distribution.

Internal consistency

Cronbach's alpha was calculated for the PASS-20-SV and its two subscales. The total score of the questionnaire showed excellent internal consistency ($\alpha = .93$). The internal consistency for the Pain-related anxiety and apprehension subscale was $\alpha = .92$ with a mean inter-item correlation of $r = .48$. The internal consistency of the Pain-related fear and avoidance subscale was $\alpha = .84$ with a mean inter-item correlation of $r = .40$.

Test-retest reliability

Test-retests reliability was assessed using data from sample 2. The ICC for the test-retest reliability of PASS-20-SV (total and factors scores) was calculated using baseline and 6-month post-assessment scores. Measurements were repeated two times for each participant.

ICC test-retest reliability was moderate for the PASS-20-SV total score (0.71: 95% CI 0.53-0.82). The paired sample *t* test [$t(75) = 2.70$, $p < .01$] showed significant differences in mean values between PASS-20-SV total scores at T1 ($M = 20.79$, $SD = 13.03$) and at T2 ($M = 17.24$, $SD = 11.61$). ICC test-retest reliability was also moderate for Pain-related anxiety and apprehension factor scores (0.73: 95% CI 0.57-0.83). Significant differences [$t(75) = 2.07$, $p < .05$] were also found in mean values between scores on this factor at T1 ($M = 5.63$, $SD = 6.79$) and T2 ($M = 4.01$, $SD = 5.89$). ICC test-retest reliability was also moderate for Pain-related fear and avoidance factor scores (0.59: 95% CI 0.36-0.74). Significant differences [$t(75) = 2.49$, $p < .01$] were found in mean values between scores on this factor at T1 ($M = 15.16$, $SD = 7.64$) and T2 ($M = 13.22$, $SD = 7.26$).

Table 1
PASS-20-SV Items: Descriptive Statistics and Factor Loading after Oblique (Promax) Rotation

PASS-20 item	Descriptive statistics				Factor loadings		
	M	SD	Skewness	Kurtosis	1	2	h^2
1. I think that if my pain gets too severe, it will never decrease	2.70	1.64	-.08	-1.24	.10	**.42**	.33
2. When I feel pain, I am afraid that something terrible will happen	1.50	1.49	.80	-.29	**.88**	-.04	.73
3. I immediately go to bed when I feel severe pain	1.17	1.47	.47	-.62	**.49**	.17	.44
4. I begin trembling when engaged in activity that increases pain	1.22	1.37	.97	.06	**.78**	-.17	.47
5. I cannot think straight when I am in pain	2.01	1.53	.27	-.82	**.45**	.18	.50
6. I will stop any activity as soon as I sense pain coming on	2.40	1.49	.13	-.78	-.01	**.74**	.57
7. Pain seems to cause my heart to pound and race	1.74	1.54	.58	-.55	**.69**	.04	.55
8. As soon as pain comes on I take medication to reduce it	3.97	1.34	-1.42	1.38	-.13	**.49**	.21
9. When I feel pain, I think that I may be seriously ill	1.32	1.40	.97	.16	**.96**	-.18	.71
10. During painful episodes, it is difficult for me to think of anything else besides the pain	1.79	1.56	.47	-.70	**.53**	.19	.59
11. I avoid important activities when I hurt	2.11	1.60	.22	-.94	.10	**.79**	.75
12. When I sense pain, I feel dizzy or faint	2.06	1.55	.22	-.83	**.49**	.24	.65
13. Pain sensations are terrifying	1.67	1.57	.65	-.61	**.81**	-.01	.65
14. When I hurt, I think about the pain constantly	2.14	1.64	.28	-.06	**.39**	.33	.54
15. Pain makes me nauseous (feel sick)	1.36	1.33	.99	.55	**.44**	.08	.47
16. When pain comes on strong, I think I might become paralyzed or more disabled	1.58	1.51	.70	-.43	**.77**	-.01	.61
17. I find it hard to concentrate when I hurt	2.45	1.52	.14	-.77	.22	**.50**	.47
18. I find it difficult to calm my body down after periods of pain	2.81	1.55	-.09	-.96	.06	**.56**	.45
19. I worry when I am in pain	2.87	1.60	-.01	-1.20	-.08	**.68**	.49
20. I try to avoid activities that cause pain	2.43	1.50	.14	-.73	-.03	**.74**	.52

Note: Sample 1. $N = 215$

Convergent validity

The PASS-20-SV, Pain-related anxiety and apprehension, and Pain-related fear and avoidance subscales all showed good to excellent criterion validity in relation to pain catastrophizing, pain vigilance, depression and anxiety symptoms, pain-related impairment, and pain intensity. The PASS-20-SV total score and subscale scores on the aforementioned variables obtained Pearson's *r* values of between .17 and .66. The lowest association was found between Pain-related fear/ avoidance and depression symptoms and the highest association was found between PASS-20-SV total score and catastrophizing. A negative low-to-moderate significant association was found between the daily functioning score and PASS-20-SV total score (Pearson's $r = -.48, p < .001$) and Pain-related anxiety and apprehension score (Pearson's $r = -.38, p < .001$). A negative high significant association was found between Pain-related fear and avoidance and daily functioning (Pearson's $r = -.52, p < .001$) (see Table 2).

Predictive validity

Table 3 shows the results of the hierarchical multiple regression analyses (data from sample 2) that predict daily functioning, pain-related impairment, and pain intensity (measured at T2), after controlling for age and sex (entered in step 1).

Regarding daily functioning, only sex ($\beta = .54, p < .001$) was entered in the first step in the equation, but PASS-20-SV scores ($\beta = -.23, p < .05$) made a significant contribution to the criterion variable (R^2 change = 0.05, $p < .05$): the higher the PASS-20-SV scores for women, the lower the daily functioning scores. In addition, PASS-20-SV ($\beta = -.59, p < .001$) was the only variable that significantly contributed to pain intensity scores (adjusted $R^2 = 0.36, p < .001$): the higher the PASS-20-SV scores, the higher the pain intensity scores. Although both sex ($\beta = .55, p < .001$) and age ($\beta = -.21, p < .05$) were entered in the first step in the equation, PASS-20-SV scores did not make a significant contribution to pain-related impairment.

Table 3
Hierarchical Regression Analyses with Pain-related Impairment, Daily Functioning, and Pain Intensity as Dependent Outcomes (Measured at Time 2), and Age, Sex, PASS-20-SV as Predictors (Measured at Time 1)

	R^2	ΔR^2	F	95% CI		β
				LL	UL	
Daily functioning						
Step 1	.303		13.94**			
Age				-.26	.01	-.19
Sex				8.48	17.71	.53*
Step 2	.341	0.05				
PASS-20-SV				-.37	-.03	-.23**
Pain-related impairment						
Step 1	.312		14.59**			
Age				-.30	-.02	-.21**
Sex				9.61	19.78	.55*
Step 2						
PASS-20-SV						.13
Pain intensity						
Step 1	.053		22.48**			
Age						.08
Sex						.13
Step 2	.364	0.32				
PASS-20-SV				.08	.15	.60*

Note: Sample 2. $N = 76$. CI = confidence interval; LL = lower limit; UL = upper limit.
* $p < .05$; ** $p < .001$

Discussion

The aim of this study was to examine the factor structure of a Spanish language version of the PASS-20. We also analysed its convergent, divergent, and predictive validity as well as its reliability (internal consistency and test-retest stability). The PASS-20-SV showed good internal consistency, adequate stability, and adequate convergent, divergent, and predictive validity. However, the results of the present study yielded a two-factor structure rather than the four-factor model of the original PASS-20 (McCracken & Dhingra, 2002), which was supported by other studies. The present results are similar to those obtained in a preliminary Spanish study (López-Martínez et al., 2011) in which a two-factor model was also obtained. The percentage of variance obtained from the present analyses was 53%. This percentage is quite similar to those obtained in previous studies using EFA. The PA also confirmed the

Table 2
Descriptive Statistics and Correlations between the PASS-20-SV Total and/or Subscale Scores and Outcome Measures for Convergent Validity

Variable	Range	M	SD	Subscale 1	Subscale 2	PASS-20-SV total score
Pain catastrophizing	13 - 52	27.45	11.44	.57	.66	.67
Pain vigilance	0 - 45	25.90	8.72	.45	.46	.49
Depression symptoms	7 - 26	19.82	3.61	.26	.17	.25
Anxiety symptoms	7 - 27	17.88	4.29	.39	.32	.39
Pain-related impairment	0 - 30	5.68	7.01	.39	.42	.44
Daily functioning	0 - 87	39.06	16.12	-.38	-.52	-.48
Pain intensity	0 - 10	5.78	1.72	.36	.38	.40
Pain-related anxiety/ apprehension (Subscale 1)	0 - 60	20.11	12.99	–	.67	.94
Pain-related fear/ avoidance (Subscale 2)	5 - 40	21.73	8.50		–	.87
PASS-20-SV total score	5 - 96	41.84	19.64			–

Note: Sample 1. $N = 215$.All correlations are significant at $p<.001$, except for the correlation between depression symptoms and Pain-related fear and avoidance subscales ($p < .05$)

two-factor structure. It should be noted that some studies have used PA and also obtained fewer factors, although the authors decided to maintain the four-factor structure. Thus, Kreddig et al. (2015) obtained one-factor solution under PA in a study that analysed the psychometric properties of the German version of the PASS-20. The mean PASS-20-SV total score matched that of the Hong Kong study (Wong et al., 2012); however, it was slightly lower than that of the Korean study (Cho et al., 2010), and was slightly higher than those of the original PASS-20 and the German (Kreddig et al., 2015) studies. Moreover, a recent study with a large sample of nonclinical participants (Rogers et al., 2020) obtained results which suggest that a higher-order model fitted the data better than the four-factor model; that is, pain-related anxiety as measured by PASS-20 is composed of four lower-order factors that load on a single higher-order factor.

Indeed, although two factors were obtained in this study, it should be noted that high values were obtained for their inter-correlation, and that very similar values were obtained for their correlations with the criteria variables used for validity analysis. The first factor derived from the analyses of the present study was named Pain-related anxiety and apprehension. This subscale included items belonging to all the four factors of the original PASS-20. Four items correspond to the original "fear of pain" subscale of the PASS-20, and another four belong to the original "physiological anxiety" subscale. It also includes three items belonging to the original "cognitive anxiety" subscale, as well as one item belonging to the original "escape/avoidance" subscale. The factor common to all these items was anxiety arising in the face of a threatening stimulus, such as pain for which the individual feels no response, thus leading to helplessness. The second factor, named Pain-related fear and avoidance, comprised items also belonging to the four original PASS-20 factors, although most of them corresponded to the "escape/avoidance" factor. In addition, two items corresponded to the "cognitive" factor of the PASS-20: one corresponded to the "fear" subscale, and the other to the "physiological anxiety" subscale. The factor common to all these items was fear of pain and the need to avoid it.

The two factors obtained in the present study differentiate between anxiety and fear as distinct although related emotional systems. Thus, anxiety has been conceptualized as an emotional response to fear, whereas fear has been defined as a cognitive response to threat (Lippold et al., 2020). Therefore, these emotions differ in relation to the avoidance alternatives that the individual perceives, even though they share similar underlying processes (Öhman, 2008). A sustained state of hyperarousal characteristic of anxiety entails apprehension, rumination, and hypervigilance, whereas fear is characterized by avoidance (Lippold et al., 2020).

The PASS-20-SV total score showed excellent reliability, which is equivalent to those reported in most language adaptation studies of the PASS-20. A very high score was obtained for the reliability of the Pain-related anxiety and apprehension subscale (Cronbach's alpha = .91), and a slightly lower but adequate score was obtained for the reliability of the Pain-related fear and avoidance scale (Cronbach's alpha = .84). Although fewer factors were obtained in the present study, these values are also comparable to those obtained in other studies. Regarding the stability of the PASS-20-SV, it should be noted that the time between the assessments at T1 and T2 was 6 months, which was much longer than that reported in other studies that analysed the test-retest reliability of the measure. It is therefore unsurprising that significant differences were obtained between T1 and T2 in the mean score of both the PASS-20-SV and the two subscales. It can also be assumed that many of the individuals in acute pain would have recovered from their condition 6 months after T1. In addition, the ICC values were more than .70 for the PASS-20-SV total score and Pain-related anxiety and apprehension subscale, confirming a satisfactory level of stability.

Correlations between PASS-20-SV and other related measurements supported good convergent and divergent validity. Low to moderate associations were found between anxiety symptoms, pain-related impairment, and pain intensity and the PASS-20-SV total score and the two-factor scores. These results are consistent with those obtained in other studies on the cultural adaptation of the PASS-20. As in other study (Kreddig et al., 2015), significant associations were found between pain catastrophizing, pain vigilance and the PASS-20-SV total score and the two subscales. However, low correlations, although significant, were found between depression symptoms and the PASS-20-SV total score and subscales. In fact, the values were lower than those found in studies also using the HADS to assess this variable (Wong et al., 2012; Zhou et al., 2017). It should be noted that the mean duration of pain in the chronic pain sample was considerably higher than that reported in other studies that also used the HADS-depression subscales. Moreover, the mean depression scores obtained in the present study were much higher than those obtained in studies that also used the HADS-depression subscale, which could be explained by the fact that the level of depression in individuals with long-term chronic pain increases over time especially when pain remains and no treatment can fully control it. Thus, although anxiety and depression could be concomitant disorders in persons with chronic pain, their trajectory over time could be different. As hypothesized, a negative moderate association was found between the PASS-20-SV factors and the total score of the scale and daily function, with the strongest correlation between functional status and the Pain-related fear and avoidance subscale. These findings are consistent with previous results showing that pain-related fear leads to avoidance, which in turn decreases daily activities (Geisser et al., 2004).

Regarding the predictive validity of the PASS-20-SV, it should be noted that outcomes variables were measured at T2 (6 months later). As far as we know, the present study on adapting the PASS-20 is the only one to have conducted a prospective analysis. Importantly, having empirical evidence available regarding the prospective impact of pain-related anxiety on pain and functional outcomes would enable the use of this variable in clinical decision making in order to conduct appropriate interventions (Rogers et al., 2020). Thus, the findings of our study showed that the PASS-20-SV total score of individuals with acute spinal pain significantly predicted both daily functioning and pain intensity. Of note, the results indicated that higher pain-related anxiety in women predicted a lower functional outcome, which is consistent with past research describing sex differences in pain adjustment (Fillingim, 2000). It should be emphasized that PASS-20-SV was able to predict more than 36% of the reported pain variance 6 months after T1. These results are relevant because they point to the need to treat pain-related anxiety symptoms when pain episodes begin. In this way, the severity of pain could be reduced to some extent.

However, although age and sex were shown to predict pain-related impairment in the sense that an association was found between being a younger woman and higher impairment (e.g.

see Stubbs et al., 2010), the PASS-20-SV did not prove to be a significant predictor of this variable. A possible explanation for this result is that pain-related impairment, as measured on the study questionnaire, refers to perceived decreases in activity levels over time due to chronic pain (Ramírez-Maestre & Esteve, 2015). Whereas pain-related anxiety can reduce activity levels to avoid harm, impairment is the result of comparing what was done before pain to what had to be stopped because of pain. It should also be taken into account that over such a short period (6 months) an individual with acute pain would not have given up very many activities because of the pain, even though the frequency of these activities would have been reduced.

All the aforementioned results have some limitations that should be considered. Firstly, the results concerning the factor structure of the PASS-20-SV are clearly different from those obtained in most of the studies that have adapted the questionnaire into other languages. Future research should replicate these results using a larger sample that is not limited to patients with chronic spinal pain. In relation to the latter aspect, although the PA confirmed the EFA results, confirmatory factor analysis is required. Secondly, the findings should not be generalized to other pain diagnosis. Finally, the results on test-retest reliability also warrant future studies using a shorter period between assessments.

Despite these limitations, the results of the present study provide clinicians and researchers with access to a valid and reliable measure of pain-related anxiety and pain-related fear for Spanish-speaking patients with pain. Recently, pain-related anxiety has been defined as a transdiagnostic individual difference factor (Rogers et al., 2020). Reductions in this variable have been linked to improved treatment outcomes for people with pain (Zale et al., 2013). For these reasons, PASS-20-SV could be a useful tool in clinical decision making and in interventions targeting the psychological treatment of Spanish people with pain conditions.

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