

Factor Structure and Psychometric Properties of the Resilience Scale in a Spanish Chronic Musculoskeletal Pain Sample

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Abstract: The concept of resilience is receiving increasing attention in the field of chronic pain. It has been shown to play a protective role in patients with osteoarthritis, fibromyalgia, and rheumatoid arthritis. Despite this finding, no resilience measurements have been validated in chronic pain populations. The Resilience Scale (RS) is a well-known instrument that has been used to assess resilience in studies conducted in the general population. When used in chronic pain samples, this scale presented the highest internal consistency compared to other resilience scales. The main aim of this study was to provide data on the factor structure, reliability, and validity of the RS in a sample of chronic musculoskeletal pain patients (n = 300). Factor analyses revealed a single-factor solution of 18 items (RS-18), which accounted for 52.43% of the total variance of this scale. The RS-18 shows good reliability (internal consistency and stability) and construct validity. This scale has the advantage of excluding items closely related to functional disability and impairment. Furthermore, the RS-18 significantly correlated with several pain-related variables (ie, catastrophizing, pain acceptance, active and passive pain coping, anxiety, depression, pain-related anxiety, disability, functioning, impairment, and pain intensity). Clinicians and researchers are thus provided with a valid and reliable instrument to assess resilience in chronic pain populations.

Perspective: This article presents the first resilience questionnaire (RS-18) for chronic pain patients. The instrument obtained shows good reliability and validity. The results provide health-care professionals and researchers with a measure of resilience in chronic pain patients that excludes items related to functional disability.

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Key words: Resilience Scale, chronic pain, measurement, reliability, factor structure, validity.

Despite the extensive debate within the field of psychology on the concept and operationalization of the resilience construct, there is broad consensus that it is a dynamic process that involves overcoming the negative effects of exposure to risk, successfully coping with adverse experiences, and avoiding negative trajectories associated with risk.^{21,36,47}

Recent attention has focused on resilience as an important process in the experience of chronic pain. Sturgeon and Zautra³⁹ have suggested that its study can illuminate those factors that protect against pain distress and disability, and explain the sustainability of a good quality of life of chronic pain patients. In fact, resilience has been shown to play a protective role in patients with osteoarthritis,⁵⁰⁻⁵² fibromyalgia,^{51,52} and rheumatoid arthritis.³⁷ Current research suggests that it is a relevant variable for the prediction of chronic pain and physical functioning among chronic pain patients.³² Resilience has shown to be associated with higher levels of pain acceptance and active coping³² and to lower levels of pain intensity,²⁶ disability,¹⁷ catastrophizing,^{17,26} and emotional distress.^{32,37,48}

Despite its emergent popularity in the field of chronic pain, none of the current scales for assessing resilience in general populations have been validated in chronic pain samples. Improving resilient behavior could be an important target for the treatment of pain patients.²⁹

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Therefore, the validation of measurements that can evaluate the efficacy of interventions designed to promote resilience in this population is of great importance.

Three scales that focus on resilience at an individual level have been employed in studies with pain populations: The Ego-Resilience Scale (ER-89),^{4,26} the Connor-Davidson Resilience Scale (CD-RISC),^{7,9} and the Resilience Scale (RS).⁴⁶ The ER-89 was developed to measure ego-resiliency as a stable personality characteristic, but because it does not depend on risk or adversity, it has been argued that it would be incorrect to use it as an indicator of resilience.⁴⁹ The CD-RISC was developed as a measure of the ability to cope with stress. Although it shows adequate psychometrics properties, it has been determined that further theoretical clarification is needed because the conceptual decisions adopted in its development were not systematic.⁴⁹ The RS was developed with the aim of identifying the degree of resilience considered as a personality characteristic that promotes adaptation.⁴⁶ Although it has been criticized due to the way its items were derived,⁴⁹ it appears to have had the widest application.¹

Ong et al²⁶ used the ER-89 to assess resilience in a sample of 95 patients experiencing low back pain and osteoarthritis. Ramírez-Maestre et al³² used the RS to assess resilience in 299 spinal chronic pain patients. Catalano et al⁷ used the CD-RISC in a sample of 255 spinal cord injury patients. Cronbach's alpha for the ER-89 was .78,²⁶ whereas the alpha coefficients for each of the 3 factors of the CD-RISC ranged from .94 to .54.⁷ Although the RS presented the highest internal consistency reliability coefficient ($\alpha = .94$),³² it should be noted that the results of these studies are based on different pain patient samples and therefore they are not directly comparable.

The RS consists of 25 items that are worded positively and are rated on a 1 (Strongly disagree) to 7 (Strongly agree) scale.⁴⁶ It comprises 2 factors accounting for 44% of the total variance: Personal competence (17 items) and Acceptance of self and life (8 items). The strengths of the RS include its internal consistency, concurrent validity with established measures of adaptation, and construct validity.^{1,32,46} The good psychometric properties of this scale, together with its high internal consistency in chronic pain populations and the fact that it has been more widely applied in general populations, place the RS as the best candidate for validation and use in chronic pain populations. Therefore, the main purpose of this study was to provide data on the factor structure, reliability, and validity of the RS in a sample of chronic musculoskeletal pain patients.

Methods

Participants and Procedures

The sample comprised 300 chronic musculoskeletal pain patients (97 males and 203 females), who were referred by physicians and physiotherapists from several primary care health centers in Málaga, Spain. The patients' mean age was 46.80 years ($SD = 13.69$) and the mean pain duration was 6.90 years ($SD = 6.40$). Regarding diagnosis, 38% had low back pain, 32% had spinal disc

disease or cord clamping, and 30% suffered cervical pain. Sixty-three percent were married or cohabited, 58.7% were employed, and 79% had undergraduate degrees. Their demographic characteristics did not differ from those found in other chronic musculoskeletal pain populations.⁵ A subsample of these participants, which consisted of 102 patients (29 males and 73 females), was evaluated again 6 months after the first assessment to estimate the stability of the RS.

Patients were eligible for the study if they met the following criteria: 1) age between 18 and 60 years, to ensure that patients were not inactive and elderly, which could affect the scores regarding their level of functional status, functional impairment, and disability; 2) presenting musculoskeletal pain of benign origin (pain area: neck, upper back, lower back, and dorsal, sacral, or coccygeal areas); and 3) having experienced continual pain or intermittent pain (appearing 5 or more days a week) for at least 6 months, with an intensity of 3 or above on the Numerical Rating Scale (NRS) of composite index of 10 points.¹⁶ The average pain intensity was 5.37 ($SD = 1.77$). Forty-one percent reported having mild pain (NRS <4), 41.2% had moderate pain (NRS = 5–7), and 17.8% had severe pain (NRS = 8–10).⁵

Exclusion criteria were 1) presence of severe injuries requiring immediate surgery; 2) presence of major psychiatric illness (ie, psychosis, schizophrenia, personality disorders, or a bipolar disorder, according to their medical history); 3) presence of other chronic diseases involving disability distinct from chronic pain; and 4) insufficient knowledge of the Spanish language.

A battery of questionnaires was completed by each participant. All patients filled out the questionnaires at their clinic while waiting to be seen by their physicians. Patients were asked if they could be contacted by phone for a second assessment. Those patients giving permission for contact were interviewed by phone 6 months later. Informed consent was obtained prior to data collection. Patients were aware that the information collected was confidential. The research project, of which this study is a part, was approved by the Ethics Committee of the Sanitary District at Málaga, Spain.

Measures

Demographic and Pain History Variables

Subjects completed a questionnaire on demographic information and medical history variables. Demographic information included age, gender, employment status, marital status, and educational level. The medical history variables were as follows: circumstances of pain onset, diagnoses, use of medication and other medical treatments, medical consultations, and pain-related surgery.

Resilience Scale

Wagnild and Young's Resilience Scale⁴⁶ was used to assess resilience. We employed forward-backward translation to adapt this scale into the final Spanish version. First, the original English version of the RS was translated into Spanish by 2 native Spanish speakers. Both were

clinical psychologists familiar with the terminology of the area covered by the instrument and had clinical experience with chronic pain patients. As a result, 2 Spanish versions were obtained and compared for inconsistencies. These inconsistencies were taken into account, and a new Spanish version was produced based on the corrections made. This Spanish version was then translated into English by a native speaker familiar with the psychological terminology. This English translation was then compared to the original English RS and checked for inconsistencies. The inconsistencies were then corrected in the final Spanish version. The translator had the opportunity of consulting studies by Heilemann et al.¹⁴ and Rodríguez et al.³⁴ Both studies provide Spanish translations of the original English RS rendered in Mexican and Argentinian style.

Pain Catastrophizing Scale (PSC)

The PCS⁴⁰ is composed of 13 items on 5-point scale, ranging from 0 (Not at all) to 4 (All the time). The items describe different thoughts and feelings that individuals may experience when they are in pain. The PCS was developed to assess 3 components of catastrophizing: rumination, magnification, and helplessness. It has excellent psychometric properties and has been widely used in research.⁴¹ The internal consistency of the Spanish version used in this study is high ($\alpha = .94$).²⁴

Chronic Pain Acceptance Questionnaire (CPAQ)

The Spanish version (CPAQ-SV) of the Chronic Pain Acceptance Questionnaire²² was applied.³ The CPAQ-SV consists of 20 items with 2 independent subscales: activity engagement and pain willingness. The items are rated on a scale from 0 (Never true) to 6 (Always true). Several studies support the internal consistency and validity of the CPAQ as a measure of acceptance of chronic pain patients.^{3,11,22,23} The Spanish version shows good internal consistency (Activity Engagement, $\alpha = .85$; Pain Willingness, $\alpha = .75$) and construct validity.³

Vanderbilt Pain Management Inventory (VPMI)

The VPMI⁶ comprises 18 items in which the frequency with which patients use a series of coping strategies when their pain reaches a moderate or greater level of intensity is rated on a 5-point scale. The instrument consists of 2 scales: active (adaptive) and passive (maladaptive) coping. Following Brown and Nicassio's⁶ procedure, the active and passive dimensions of coping were identified in the Spanish version of the inventory. Both scales showed suitable internal consistency, $\alpha = .80$ for active coping and $\alpha = .82$ for passive coping.¹²

Hospital Anxiety and Depression Scale (HADS)

The HADS⁵³ comprises two 7-item scales designed to rate depression (HADS-D) and anxiety (HADS-A), respectively. Ratings may range from 1 (Almost always) to 4 (Almost never). It has the advantage of brevity. In addition, it excludes items that might reflect somatic

The Chronic Pain Patient Resilience Scale complaints, thus improving the assessment of anxiety and depression in pain patients. The Spanish version³⁰ shows suitable reliability (HADS-D, $\alpha = .82$; HADS-A, $\alpha = .81$).

Pain Anxiety Symptoms Scale (PASS)

Pain-related anxiety was assessed using the PASS,²³ a 40-item self-report measure designed to assess anxiety and fear responses related to the experience of chronic or recurrent pain. The PASS total score was used in this study, which is calculated by summing the individual item scores. Prior research has supported the psychometric properties of the PASS.^{23,27,44} Given that a Spanish version of the PASS has not been available up to now, the questionnaire was specifically translated (using forward-backward translation) into Spanish for this study. Based on the data provided by the sample used in this study, the internal consistency of this Spanish version was $\alpha = .87$.

The Roland Morris Disability Questionnaire (RMDQ)

The RMDQ³⁵ consists of 24 items in which the responders are asked to rate the degree to which pain interferes with functioning in different areas of life. Ratings may range from 0 (No disability) to 24 (Maximum disability). The Spanish version of this scale¹⁸ shows suitable reliability ($\alpha = .84$) and validity.

The Impairment and Functioning Inventory (IFI)

The IFI³¹ is composed of 30 items referring to activities related to 1 of the following areas: household, autonomous behavior, leisure, and social relationships. The instrument provides an index of functioning and an index of impairment. The subscales and the global scales of this questionnaire show suitable reliability ($\alpha = .84$ for functional status, and $\alpha = .85$ for functional impairment). Factor analytic techniques support its hypothesized internal structure.³¹

Pain Numerical Rating Scale

In line with Jensen et al's recommendations,¹⁶ patients were asked to rate their least pain, average pain, and worst 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 4 scores was calculated to obtain the average pain intensity.

Data Analyses

All analyses were performed using the SPSS statistical package, v.19.0 for Windows (SPSS Inc, Chicago, IL). The normality of the distribution was evaluated as well as the presence of univariate and multivariate outliers. Descriptive statistics were calculated for the RS total scale and the RS subscales. An item-by-item reliability analysis was conducted. Subsequently, a principal components analysis (PCA) was performed. To determine the number of factors obtained by the analyses, eigenvalues and scree-plots were examined. Due to the

moderate correlations found between the factors, oblique rotations (ProMAX, Irvine, CA) were used. Only those items with factor loadings greater than .40 were considered to load onto a factor. The items should not show cross-loading (ie, a second loading greater than .35). After this preliminary PCA, those items that presented poor properties according to the item reliability analyses or that were problematic in the PCA were removed. The PCA was then repeated without including these items.

Cronbach's alpha coefficients were calculated to examine the internal consistency of the RS. Values of $\alpha > .70$ were considered adequate.^{15,42} The stability of the scale (test-retest) was examined 6 months later by computing the Pearson product moment correlation coefficient. In addition, mean differences in RS total score at the first (T1) and the second (T2) assessments were examined using the Student t-test.

Construct validity was analyzed by examining partial correlations, controlling for diagnosis and pain duration, between the RS and a number of pain-related variables theoretically related to resilience. These variables were as follows: catastrophizing, pain acceptance, general acceptance, pain coping, emotional distress variables (ie, anxiety, depression, and pain-related anxiety), and pain adjustment variables (ie, disability, functional impairment, daily functioning, and pain intensity). The

correlation between resilience and pain duration was also examined.

Results

Preliminary Analyses

All the variables were normally distributed. Univariate and multivariate outliers were not detected. The results of the Student t-tests showed that the means of the total RS scores and the RS subscales scores were comparable for men (RS-total, factor 1 and factor 2 score means = 121.20 [SD = 17.70], 83.93 [SD = 11.73], and 37.19 [SD = 6.56], respectively) and women (RS-total, factor 1 and factor 2 score means = 121.50 [SD = 19.21], 84.30 [SD = 12.22], and 31.15 [SD = 7.24], respectively). Furthermore, no significant gender differences were found in relation to any of the pain-related variables assessed, although women obtained higher scores in all of them with the exception of active pain coping, in which men had higher scores. Therefore, separate validity and reliability analyses for each gender were not conducted. Item 20 was eliminated because it showed low intertotal correlations with the other RS items (less than .25) and because other studies have also reported inconsistent results regarding this item.^{33,34} Descriptive statistics (means, standard deviations, corrected intertotal

Table 1. Descriptive Statistics of the Resilience Scale Items (Chronic Musculoskeletal Pain Sample; n = 300)

RESILIENCE SCALE ITEMS*	M	SD	CITC	α
Personal competence factor				
1. When I make plans I follow through with them.	3.98	2.26	.60	.91
2. I usually manage one way or another.	4.88	1.13	.74	.91
3. <i>I am able to depend on myself more than anyone else.</i>	4.45	1.15	.59	.91
4. Keeping interested in things is important to me.	5.04	1.06	.76	.91
5. <i>I can be on my own if I have to.</i>	3.73	1.92	.53	.91
6. I feel proud that I have accomplished things in my life.	4.50	1.16	.61	.91
9. <i>I feel that I can handle many things at a time.</i>	4.31	1.17	.60	.91
10. I am determined.	3.71	2.44	.67	.91
13. <i>I can get through difficult times because I've experienced difficulty before.</i>	4.93	1.29	.45	.92
14. I have self-discipline.	4.49	1.23	.72	.91
15. I keep interested in things.	4.76	1.49	.69	.91
17. My belief in myself gets me through hard times.	4.63	1.09	.68	.91
18. <i>In an emergency, I'm someone people generally can rely on.</i>	3.78	2.10	.50	.91
19. I can usually look at a situation in a number of ways.	4.13	1.16	.58	.91
20. <i>Sometimes I make myself do things whether I want to or not.</i>	4.38	0.99	.19	.92
23. When I'm in a difficult situation, I can usually find my way out of it.	4.20	1.48	.77	.91
24. <i>I have enough energy to do what I have to do.</i>	4.48	1.35	.59	.91
Acceptance of self and life factor				
7. I usually take things in my stride.	4.31	1.27	.72	.86
8. I am friends with myself.	4.40	1.07	.66	.86
11. I seldom wonder what the point of it all is.	3.54	2.27	.56	.87
12. I take things one day at a time.	4.33	1.11	.52	.88
16. I can usually find something to laugh about.	3.86	2.39	.77	.85
21. My life has meaning.	4.15	1.28	.69	.86
22. I do not dwell on things that I can't do anything about.	3.84	2.01	.76	.86
25. It's okay if there are people who don't like me.	4.73	1.24	.50	.88

Abbreviation: CITC, corrected item total correlations.

NOTE. The items in italics were dropped in the final scale. α = Alpha scale if item deleted.

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correlations, and scale-alpha-if-item-deleted values) of the RS items are presented in Table 1.

Factor Analysis

The results of the Kaiser-Meyer-Olkin measure of sampling adequacy (.93) as well as the Bartlett Test of Sphericity ($\chi^2 = 5208.85$; $P < .001$) supported the use of factor analysis.⁴² Both the scree-plot and the eigenvalues suggested a 4-factor solution, with eigenvalues exceeding 1 (11.41, 1.70, 1.47, and 1.37). Together, these factors accounted for 66% of the total variance of the original items. However, the rotated solution does not show a clear distribution of items. Three factors were composed of hyperplane items, and 5 items (3, 5, 9, 18, and 24) cross-loaded onto more than 1 factor. In the original scale, these 5 items belong to the personal competence factor. The content of these items is related to the capacity for autonomy and daily functioning (eg, item 9: "I feel that I can handle many things at a time"). These items were eliminated, as well as item 13, which presented a factor loading of .24 maximum as well as low intertotal correlations with the items. The PCA was repeated without taking them into consideration.

The new PCA analysis yielded a single-factor solution of 18 items (RS-18) with factor loadings that ranged

Table 2. Resilience Scale-18 One-Factor Solution and Communalities (Chronic Musculoskeletal Pain Sample; n = 300)

RS-18 ITEMS*	FACTOR LOADINGS	h ²
1. Cuando hago planes, soy persistente con ellos.	.63	.59
2. Normalmente, sea de un modo u otro, me manejo bien con los problemas.	.77	.72
4. Para mí es importante mantener el interés por las cosas.	.78	.68
6. Me siento orgulloso/a de haber logrado cosas en mi vida.	.66	.66
7. Normalmente me tomo los éxitos y los fracasos con naturalidad.	.77	.63
8. Soy amigo de mí mismo.	.70	.55
10. Soy decidido/a.	.73	.62
11. Rara vez me pregunto el por qué de las cosas.	.61	.64
12. Dejo las cosas hechas en el día.	.62	.54
14. Soy autodisciplinado/a.	.77	.63
15. Mantengo el interés por las cosas.	.78	.83
16. Suelo encontrar cosas con las que reírme.	.80	.86
17. Mi autoconfianza me ayuda a resolver problemas.	.78	.72
19. Suelo analizar una situación desde varios puntos de vista.	.68	.61
21. Mi vida tiene sentido.	.73	.70
22. No me estanco en las cosas que no tienen solución.	.80	.68
23. Ante una situación difícil, suelo encontrar la manera de salir adelante.	.77	.66
25. No me importa no gustarle a todo el mundo.	.62	.60
Explanatory variance (%)		52.43

NOTE. h² = Item communalities.

*This 18-factor Spanish version was translated and adapted from the original 25-item English version with permission. The Resilience Scale is copyrighted internationally by Gail M. Wagnild and Heather M. Young (1993). For more information on the RS, see www.resiliencecale.com.

between .60 and .81 (Table 2). This solution accounted for 52.43% of the total variance. This 1-factor solution included all the items of the acceptance of self and life factor, and 10 items of the 17 items of the personal competence factor of the original RS-25.

Reliability

The RS-18 showed high internal consistency, with an alpha coefficient of .92. Regarding test-retest reliability, the result of the Pearson product moment correlation coefficient was in the larger effect size range⁸ ($r = .90$; $P < .001$). In addition, according to the results of the Student t-test on the stability of the scale, there were no significant differences between the mean RS-18 score ($M = 85.43$; $SD = 15.53$) at T1 and the mean RS-18 score ($M = 86.70$; $SD = 15.19$) at T2 ($t [299] = 95.297$; $P = .15$).

Construct Validity

Table 3 shows the partial correlations, controlling for diagnosis and pain duration, between the RS-18 and the pain-related variables.

As can be seen, the results of these analyses showed significant correlations between RS-18 and all the pain-related variables considered in this study. A small effect size⁸ was found between the RS-18 and pain intensity. Medium effect sizes⁸ were found between the RS-18 and anxiety, disability, and functional impairment. Large effect sizes⁸ were found between the RS-18 and catastrophizing, pain acceptance, active coping, passive coping, pain-related anxiety, depression, and daily functioning. No correlation was found between RS-18 and pain duration ($r = .028$; $P = .624$).

Discussion

The main purpose of this study was to provide data on the factor structure, reliability, and validity of the RS⁴⁶ in a sample of chronic musculoskeletal pain patients. The

Table 3. Partial Correlations Between the Resilience Scale-18 and Pain-Related Variables (Chronic Musculoskeletal Pain Sample; n = 300)

PAIN-RELATED VARIABLES	RS-18 SCORE
Pain Catastrophizing Scale	-.70
Spanish version of the Chronic Pain Acceptance Questionnaire	.74
Vanderbilt Pain Management Inventory (Active Pain Coping subscale)	.63
Vanderbilt Pain Management Inventory (Passive Pain Coping subscale)	-.68
Hospital Anxiety Depression Scale (Anxiety subscale)	-.36
Hospital Anxiety Depression Scale (Depression subscale)	-.70
Pain Anxiety Symptoms Scale	-.56
Roland-Morris Disability Questionnaire	-.39
Inventory of Functioning and Impairment (Impairment subscale)	-.46
Inventory of Functioning and Impairment (Functioning subscale)	.54
Numerical Rating Scale of Pain	-.21

NOTE. All correlations significant at $P < .01$.

factor structure of the original RS was not replicated, as our results did not support the 2-factor structure of this questionnaire. The PCAs conducted reduced the scale to a single 18-item factor (RS-18), which accounted for 52.43% of the total variance. It included items from the 2 factors of the original RS-25 items (personal competence, and acceptance of self and life). Furthermore, the RS-18 obtained showed excellent reliability as well as construct validity.

Although the RS has a good reliability and validity scale for measuring resilience, diverse factor structures have been found in different countries. This could be explained by the fact that the meaning of resilience may be culturally and contextually dependent, as has been shown in the results obtained by the International Resilience Project.⁴³ Also, the differences in the underlying dimensions of the RS could be related to the sampling procedures. Thus, there is an overrepresentation of women in the participants of the studies that have been carried out to elucidate the factor structure of the RS.^{14,20,25} Regarding the age of the participants that compose the samples of several of these studies, many of them were university students or young people.^{14,25,28} However, the RS-18 is similar to the short version of the RS (RS-14) recently developed by Wagnild.⁴⁵ Unfortunately, this 14-item version has not yet been validated and therefore no data are available to compare the 2 versions. Nevertheless, the authors of the only published study that examined the factor structure of the RS-14,²⁵ which was conducted using a sample of Japanese university students, also found a single-factor solution. The RS-14,⁴⁵ the Japanese version of the RS-14,²⁵ and the RS-18 have in common 10 items (namely, items 2, 6, 7, 8, 10, 14, 15, 16, 21, and 23), all belonging to the personal competence dimension. In addition, our results are similar to those obtained by Aroian et al² in the Russian version of the RS, which consists of 12 items also distributed on a single factor. In fact, except for the adaptation of the RS to a Mexican female population,¹⁴ the reliability and validity of the second factor were open to question in those studies in which more than 1 factor was obtained.^{20,28,33,34} Taken together, these findings suggest that this resilience scale is a 1-dimensional instrument that includes aspects of both original factors: personal competence, and acceptance of self and life.

Seven items were removed from the questionnaire (ie, items 3, 5, 9, 13, 18, 20, and 24). Item 20 ("Sometimes, I make myself do things whether I want to or not") was eliminated due to its low item-total correlation. Inconsistencies regarding this item have also been found by other authors.^{33,34} In fact, neither was item 20 included in the RS-14. This item may reflect thoughts that most people normally have, rather than resilience, as a manifestation of positive adaptation within the context of significant adversity^{21,36,47} (for example, consider what many people think when the alarm clock rings in the morning). Therefore, it could be that this item may not reflect resilience but rather a type of everyday thinking. Item 13 ("I can get through difficult times because I've experienced difficulty before") was removed because its item-total correlation was very low after removing item 20, and

it did not load on any factors, as occurred in the study by Rodríguez et al.³⁴

The remaining items that were eliminated (ie, items 3, 5, 8, 18, and 24) belonged to the personal competence factor. An examination of the content of these items, compared to the rest—alluding to personal competence in a broader sense—seems to reflect a personal capacity for what is needed to possess a certain level of autonomous functional living ("I am able to depend on myself more than anyone else," "I can be on my own if I have to," "I feel that I can handle many things in my stride," "In an emergency, I am someone people can generally rely on," "I have enough energy to do what I have to do"). Due to the fact that functional disability and impairment are characteristic in patients experiencing chronic pain,¹³ it is not surprising that these items shared little variance with the remaining items, which, as a result, had to be eliminated. This is a relevant finding and should be taken into account by authors assessing resilience in these types of patients. If this is not taken into account, then they may not be assessing this construct, but other aspects that do not form part of the concept of resilience.

The RS-18 showed high internal consistency (Cronbach's $\alpha = .92$). In addition, the magnitude of the correlations between the RS-18 scores at both assessment times ($r = .90$) supported the stability of the concept of resilience. Although resilience is currently conceptualized as an ability rather than as a single personality trait, it is also considered a stable quality,⁴⁶ as supported by our findings.

The results of this study also showed that the RS-18 has adequate construct validity. It showed medium-to-large effect sizes with conceptually related measures of adaptation to pain, after controlling for diagnosis and pain duration. Taken together, our findings indicated that resilience could be considered the ability of patients facing a disabling physical illness to maintain relatively stable levels of psychological, emotional, and social functioning, as Quale and Schanke²⁹ have also recently argued. In line with other works,^{19,26,32} in the present study resilience was associated with better adaptation to pain. Specifically, it was positively associated with pain acceptance, increased use of active coping strategies, and higher daily functioning levels. Furthermore, these correlations have been shown to be large ($r > .50$). On the other hand, and in line with findings from studies conducted with different pain disorder samples,^{38,48,50} our findings supported the protective role of resilience in patients with chronic musculoskeletal pain.

Large effect sizes were found between the RS-18 and those variables traditionally associated with poor adjustment to chronic pain (ie, catastrophizing, passive pain coping, depression, and pain-related anxiety). Regarding the relationship between resilience and catastrophizing, our results confirm the postulates of Karoly and Ruhlman,¹⁷ as well as the results of Ong et al,²⁶ and suggest that resilience may become an important variable to understand the successful adaptation of patients to pain, taking into account the buffering role that it

seems to exert over catastrophizing. In addition, these results support the findings of Catalano et al,⁷ as they suggest that the characteristics of resilience serve as a buffer against depressive symptoms. Furthermore, given our findings, resilience also seems to buffer pain anxiety.

Resilience was also associated with lower levels of pain intensity, as indicated in previous studies.^{17,19,50,51} However, although significant, this association was low, which is consistent with the arguments of Karoly and Ruehlman.¹⁷ These authors suggest that resilience in chronic pain patients has a stronger relationship with low interference in daily functioning and low emotional distress, than with the level of pain. In fact, psychological resilience has been considered as a dynamic process that involves the ability to achieve positive adaptation in a context of significant adversity. Moreover, resilience concerns exposure to adversity and the positive adjustment outcomes to that adversity.^{36,47} Furthermore, Wagnild and Young⁴⁶ described resilience as the "... ability to identify what is stressful, appraise realistically one's capacity for action, and problem solve effectively."

Therefore, in the specific context of chronic pain, it seems that resilience involves the ability to adapt to pain, which in this case represents the adverse situation. In line with other suggestions, it appears that a resilient pain patient is an individual who does not succumb to illness.⁴⁶ This assumption is reinforced by results that show a negative association between resilience and the variables related to poor adjustment to pain (ie, passive coping, pain disability, functional impairment, depression, anxiety, and pain-related anxiety) and a positive relationship between resilience and the variables involved in pain adjustment (ie, active coping, daily functioning, and pain acceptance). Furthermore, the results of the current study have shown that resilience is a stable characteristic that is not related to pain duration. This finding is in line with the notion of psychological resilience as a relatively stable personal trait characterized by the ability to overcome and steer through from adversity.²⁶

This study has several limitations. The foremost is the use of a musculoskeletal chronic pain sample. Additional

research is needed to determine whether the findings obtained in the current sample can be generalized to samples of individuals with other chronic pain disorders and/or less severe pain. A second limitation is that self-report instruments alone were employed to assess the variables examined. Our results should be replicated in future studies using another assessment method. Third, the possible influence of pain interventions (eg, medication, physiotherapy, activity-related instructions) was not controlled. Finally, although not less relevant, it should be taken into account that the RS focuses on resilience at an individual level; that is, as a personal quality that characterizes some people. However, the resilience construct is far from clear and, as a result, debate continues on how it is best measured (see the recent review by Windle et al⁴⁹ and the special issue on resilience in the *Journal of Personality*¹⁰ for further discussion of these aspects).

Despite these limitations—and as far as we know—this is the first study aimed at adapting a resilience questionnaire to patients suffering chronic pain. We provide clinicians and researchers with a valid and reliable instrument, the RS-18, to assess resilience in chronic pain patients. By using this scale, researchers will be able to conduct studies on the factors that promote quality of life and recovery in patients with chronic pain, as has been recently pointed.³⁹ This should lead to improvements in therapy for these patients, as increasing resilience should be one of the main aims of chronic pain interventions. Furthermore, the RS-18 scores seem to be useful in predicting adjustment to chronic pain in both the short and long term.

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