Associations Between Psychosocial Factors and Pain Intensity, Physical Functioning, and Psychological Functioning in Patients With Chronic Pain

A Cross-cultural Comparison

Maria A. Ferreira-Valente, PhD,† José L. Pais-Ribeiro, PhD,*‡ and Mark P. Jensen, PhD§*

Objective: Current models of chronic pain recognize that psychosocial factors influence pain and the effects of pain on daily life. The role of such factors has been widely studied on English-speaking individuals with chronic pain. It is possible that the associations between such factors and adjustment may be influenced by culture. This study sought to evaluate the importance of coping responses, self-efficacy beliefs, and social support to adjust to chronic pain in a sample of Portuguese patients, and discuss the findings with respect to their similarities and differences from findings of studies on English-speaking individuals.

Materials and Methods: Measures of pain intensity and interference, physical and psychological functioning, coping responses, self-efficacy, and satisfaction with social support were administered to a sample of 324 Portuguese patients with chronic musculoskeletal pain. Univariate and multivariate analyses were computed. Findings were interpreted with respect to those from similar studies using English-speaking individuals.

Results: Coping responses and perceived social support were significantly associated with pain interference and both physical and psychological functioning; self-efficacy beliefs were significantly associated with all criterion variables. All coping responses, except for task persistence, were positively associated with pain interference and negatively associated with physical and psychological functioning, with the strongest associations found for catastrophizing, praying/hoping, guarding, resting, asking for assistance, and relaxation.

Discussion: The findings provide support for the importance of the psychosocial factors studied in terms of adjustment to chronic pain in Portuguese patients, and also suggest the possibility of some differences in the role of these factors due to culture.

Key Words: chronic pain, cross-cultural, coping, social support, self-efficacy

(*Clin J Pain* 2014;30:713–723)

Chronic pain (CP) is a significant health problem estimated to affect about 1 of 5 adults worldwide.[1,2] Contemporary models of CP hypothesize a key role for psychosocial factors the adjustment.[3–8] Moreover, research supports the importance of psychosocial factors as predictors of pain and functioning. In particular, research indicates that self-efficacy beliefs (defined as an individual's belief or confidence in his/her ability to engage in specific actions or behaviors in pursuit of desired aims)[5,9–16] and the coping responses of task persistence, guarding, resting, asking for assistance, praying/hoping, and catastrophizing[4,5,7,16–27] demonstrate the most consistent associations with pain intensity and patient functioning in individuals with CP. Social support has also been shown to be associated with patient's functioning in some studies, although the strength and direction of this association have been less consistent.[4,5,28–30] Moreover, previous studies on patients with different health conditions suggest the existence of sex differences in social support, although the results are not always consistent regarding the existence of the differences between men and women in the association between social support and physical health.[31,32]

In contrast, coping is a situation-determined and culturally determined variable, and what may be adaptive in a culture may or may not be adaptive in another.[33–38] Thus, the generalizability of the findings of pain-coping research derived from studies on English-speaking patients, in particular patients from the United States (US) (who represent the majority of the studies on coping with CP),[5,7,16,18,20,21,23–25] to other cultures, including Portuguese culture, is not clear.[39] Two types of studies could potentially help us understand the role that culture might play in understanding the role that psychosocial factors play in adjustment to CP: (1) studies comparing the strengths of these associations between individuals in different countries[4,15,40]; and (2) studies comparing the strengths of these associations between individuals from different ethnic groups living in the same country.[12,31–33,38,41] Findings from both types of studies support potential importance of culture.

Received for publication April 2, 2013; revised December 2, 2013; accepted September 2, 2013.

From the *Unidade de Investigação em Psicologia e Saúde, Lisboa; †Portuguese Foundation for Science and Technology; ‡Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Porto, Portugal; and §Department of Rehabilitation Medicine, University of Washington School of Medicine, Seattle, WA.

M.A.F.-V. has received PhD grant SFRH/BD/40956/2007 from the Portuguese Foundation for Science and Technology. M.P.J. has received research support, consulting fees, or honoraria in the past 3 years from Allergan, Analgesic Solutions, Bristol-Meyers Squibb, Covidien, Depomed, Endo, Merck, Pfizer, RTI Health solutions, Schwartz Biosciences, Smith & Nephew, ZARS Pharma, Zogenix, US Department of Education, US Department of Veterans Affairs, and the US National Institutes of Health. The remaining authors declare no conflict of interest.

Reprints: Maria A. Ferreira-Valente, PhD, Unidade de Investigação em Psicologia e Saúde, Rua José das Dornas, 107, 3880-791 Ovar, Portugal (e-mail: mafvalente@gmail.com).

In an earlier study, Ferreira-Valente et al[39] examined the associations between coping and measures of patient functioning in a sample of patients from Portugal and compared these findings with the results reported by researchers in the US. The authors found many similarities but also some intriguing differences in the associations between coping and adjustment to chronic pain. Specially, unlike the results often found in English-speaking patients, (1) task persistence, as measured by the Chronic Pain Coping Inventory (CPCI), was not negatively associated with measures of pain and dysfunction; (2) seeking social support was moderately and positively associated with pain interference; (3) praying/hoping was moderately negatively associated with depression; and (4) increasing behavioral activities were negatively associated with depression. These dissimilarities suggest that not all studies conducted on English-speaking patients generalize to other cultures.

In contrast, 2 of the significant associations found in this previous study not only replicated the associations found in studies from the US, but have also been replicated in studies conducted in other countries. Specially, associations related to pain self-efficacy and catastrophizing, with the former being associated negatively with pain-related variables (pain intensity and pain interference), depression and anxiety, and positively associated with physical and mental health, and the latter being positively associated with pain and both psychological and physical dysfunction.[15,39,40,42–46]

The primary aim of the current study was to examine the importance of self-efficacy beliefs, perceived social support, and pain-coping responses to adjustment in a sample of Portuguese patients with CP. If the findings from previous studies conducted on English-speaking patients were to replicate, we would hypothesize that (1) self-efficacy beliefs and perceived social support would be significantly and negatively associated with pain intensity and pain interference, and positively associated with general physical and psychological functioning.[5,10,12–16,46–48] We would also hypothesize that (2) both adaptive and maladaptive coping responses would show weak to moderate associations with pain, pain interference, and physical and psychological functioning, with the coping responses classified as maladaptive tending to show stronger associations than measures of adaptive responses with measures of dysfunction.[5,7,16,18,20,21,23–25]

MATERIALS AND METHODS

Participants

A total of 324 adults with chronic musculoskeletal pain who were outpatients of 7 health institutions in the North, Center, and South of Portugal participated in the study. Study inclusion criteria were: (1) being at least 18 years old; (2) experiencing pain because of a musculoskeletal condition for at least 3 months; and (3) the absence of a physical disability or cognitive impairment that would prevent participation. The exclusion criteria were: (1) significant psychopathology (eg, active suicidal intention); and (2) diagnosis of fibromyalgia.

Measures

Participants were asked to provide basic demographic and pain history information (age, sex, marital status, level of education, professional status, duration of pain, pain location, and cause of pain), as well as information regarding pain intensity, pain interference, physical and psychological functioning, pain-coping responses, self-efficacy, and perceived social support, using self-report questionnaires.

Pain Intensity

Average pain intensity during the previous 24 hours was assessed using a 0 to 10 Numerical Rating Scale (NRS). Research supports the validity, responsivity, and reliability of the NRS as a measure of pain intensity.[49,50]

Pain Interference

The Portuguese Brief Pain Inventory Interference Scale (P-BPI) was used to assess pain interference.[51–53] The scale asks respondents to rate the extent to which pain interferes with 7 life activities (general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life) on 0 to 10 NRS (0 = "Does not interfere";10 = "Completely interferes"). Scores can range from 0 to 70, with higher scores indicating greater pain-related interference with functioning. The Portuguese version of the BPI used in this study has demonstrated good internal consistency (Cronbach $\alpha = 0.82$ and 0.91) and concurrent validity through its significant associations with measures of physical (SF-12 Physical Component Summary: $r = -0.42$ to -0.61) and psychological functioning (SF-12 Mental Component Summary: $r = -0.45$ to -0.63; HADS Anxiety Scale: $r = 0.43$ to 0.50; HADS Depression Scale: $r = 0.31$ to 0.45).[49,51] Factorial validity of the P-BPI has also been supported by confirmatory factor analysis yielding a 1-factor solution.[53]

Physical and Psychological Functioning

The Portuguese SF-12[54] was used to measure physical and psychological functioning. The scale has 12 items that are scored to provide a Physical Component Summary (PCS) score and a Mental Component Summary (MCS) score. Scores range from 0 to 100, with the higher scores indicating better physical and mental health status. Evidence supports the validity and reliability of the Portuguese version of the measure.[54]

Self-Efficacy Beliefs

The Portuguese Pain Self-Efficacy Questionnaire (P-PSEQ)[43] was used to assess pain-related self-efficacy. The 10-item scale assesses confidence to engage in a number of activities of daily living, despite pain on 0 to 6 NRS, where 0 = "Not at all confident" and 6 = "Completely confident." Scores on the PSEQ can range from 0 to 60, and higher scores reflect stronger self-efficacy beliefs. The Portuguese version used in this study has shown good internal consistency (Cronbach $\alpha = 0.88$) and concurrent validity by significant correlations with measures of pain (NRS: $r = -0.28$; BPI Interference scale: $r = -0.41$), physical functioning (SF-12 PCS: $r = 0.51$), and psychological functioning (SF-12 MCS: $r = 0.46$; HADS Anxiety Scale: $r = -0.39$; HADS Depression Scale: $r = 0.55$).[43] In addition, confirmatory factor analysis has yielded a 1-factor solution, supporting the factorial validity of this version of the scale.[43]

Social Support

The Social Support Satisfaction Scale (ESSS) was used as a measure of perceived social support.[55] The scale consists of 15 items that assess satisfaction with perceived support of friends and family, as well as with intimacy and social activities. Respondents report the level of agreement with each item, in a 5-point Likert scale, from "Totally agree" to "Totally disagree." Scores can range from 15 to 75, with the higher scores on the measure representing higher levels of perceived social support. In validation studies, the ESSS has shown satisfactory to good reliability for the total scale (Cronbach α of 0.85), and discriminant and concurrent validity, through its association with health-related measures.[55,56] In the current sample, the internal consistency of the ESSS was satisfactory to good (Cronbach α of 0.84), both for women (Cronbach α of 0.86) and men (Cronbach α of 0.77).

Pain Coping

Coping responses were assessed using the Portuguese 2-item per scale CPCI-16 and the Portuguese 2-item per scale Coping Strategies Questionnaire (CSQ-14).[55] The CPCI-16 is a 16-item scale that assesses 8 pain-coping domains (guarding, resting, asking for assistance, relaxation, task persistence, exercise/stretch, seek support, and coping self-statements). For each of the 16 items, respondents report the number of days of the past 7 days that they used for each coping strategy to deal with pain. Scores on the CPCI-16 scales can range from 0 to 7.

The CSQ-14 is composed by 14 items, grouped into 7 coping domains (diverting attention, reinterpreting pain sensations, ignoring pain, praying and hoping, coping self-statements, catastrophizing, and increasing behavioral activities), with scores ranging from 0 to 6. The CSQ-14 asks respondents to indicate the frequency that they use for each coping strategy on a 7-point Likert scale (0 = "Never do that" and 6 = "Always do that"). The CPCI-16 and CSQ-14 subscales have shown validity through their strong associations ($r \geq 0.70$) with the corresponding scales of their original full-length versions and their patterns of associations with pain-related variables.[18] The Portuguese versions of both measures have shown concurrent validity through a pattern of significant correlations with measures of physical and psychological functioning, consistent with previous research.[57]

Procedure

A convenience sample of participants was recruited among the outpatients of 7 health institutions in the north, center, and south of Portugal. The patients meeting the inclusion criterion were invited to participate in the study while waiting for their physical therapy session to start, and informed about the study aims and procedures. By the time the data collection began, all participants had started their rehabilitation program, with the majority of the participants completing the study measures between the second and fourth sessions of the physical therapy. After signing an informed consent form, all participants completed a demographic and pain history questionnaire, as well as the 0 to 10 NRS, P-BPI Interference Scale, CPCI-16, CSQ-14, and SF-12. To minimize the assessment burden, not all participants completed both self-efficacy (P-PSEQ) and social support (ESSS) measures. Instead, participants were randomly assigned to complete either the P-PSEQ or the ESSS in addition to the others administered, and a smaller group of 11 participants did not complete either of these measures. Participants who were unable to read or write were assisted by the investigators in completing the measures.

Data Analysis

We first computed the means and SDs of all the study variables for descriptive purposes. Next, we computed a series of partial correlation coefficients, controlling for sex and age to examine the univariate associations between the psychosocial factors (self-efficacy beliefs, social support, and pain-coping responses), and measures of pain and functioning (pain intensity, pain interference, physical, and psychological functioning). We also computed a series of Pearson correlation coefficients between the psychosocial variables of the study for descriptive purposes.

Finally, we performed a series of 12 hierarchical multiple regression analyses, 3 for each criterion variable, controlling for sex and age, to test the predictive importance of these psychosocial factors on adjustment. Because not all participants completed all the study measures, we performed separate regression analyses using coping responses, self-efficacy beliefs, and social support as independent variables. The Cohen f^2 for each hierarchical multiple regression were computed as measures of effect size, with effects of 0.02 being considered small, 0.15 medium, and 0.35 large effects.[58] As we have done previously,[5] we used principal components analyses (PCAs) to reduce the number of variables to be used in the planned regression analyses. Specifically, and separately for the CSQ-14 and CPCI-16 subscale scores, we used PCA with an orthogonal rotation (varimax) to identify the belief and coping components embedded in the CSQ-14 and CPCI-16 scales. We used PCA because it enables the maximum variance extraction from the data.[57] Component scores were computed and used in the regression analyses. To balance the need to control for α-inflation with the need to protect against type II errors (ie, identifying an association as not significant when it is present in the population), we used an α-level of 0.01 to determine that a regression analysis result was significant.[59,60]

The PCA of the CSQ-14 subscales resulted in a 2-component solution (first 3 eigenvalues: 3.16, 1.32, and 0.75), accounting for 61.27% of the variance in CSQ-14 coping responses. Four subscales loaded on the first component (Reinterpreting Pain Sensations, 0.75; Ignoring Pain, 0.75; Coping Self-Statements, 0.69; and Increasing Behavioral Activities, 0.71), and 2 on the second component (Catastrophizing, 0.86; and Praying/Hoping, 0.82). One subscale, Diverting Attention, loaded on both the components (0.53 on the first component, and 0.52 on the second component). Similarly, the PCA of the CPCI-16 subscales resulted in a 2-component solution (first 3 eigenvalues: 3.17, 1.37, and 0.79), accounting for 56.77% of the variance in CPCI-16 coping responses. Four subscales loaded on the first component (Guarding, 0.79; Resting, 0.74; Asking for Assistance, 0.76; and Seeking, 0.64), and another 4 on the second component (Relaxation, 0.65; Task Persistence, 0.73; Exercise/Stretch, 0.59; and Coping Self-Statements, 0.67). The results of the PCA are similar to the theoretical structure of the original CPCI, distinguishing between wellness-focused and illness-focused coping.[61] Thus, we labeled the first component illness-focused coping, and the second component wellness-focused coping.

Missing data from any of the coping scales resulted in that scale being excluded from the analyses, because each scale is only made up of 2 items. A single missing response from the 7-item BPI Interference scale, 10-item P-PSEQ, and the 15-item ESSS was replaced by the mean of the other items; although, if > 1 item was missing, the entire scale was excluded from the analyses. All statistical analyses were performed using PASW Statistics 18 (version 18, SPSS Inc., Chicago, IL).

TABLE 1. Participants' Sociodemographic Characteristics

	N (%)	Mean	SD	Minimum	Maximum
Sex (women)	66	—	—	—	—
Age		60.97	15.40	18	90
Education level					
None	2	—	—	—	—
First to fourth grade	46	—	—	—	—
Fifth to 12th grade (high school)	41	—	—	—	—
College	11	—	—	—	—
Marital status					
Married or in cohabitation	62	—	—	—	—
Widowed	16	—	—	—	—
Divorced/separated	8	—	—	—	—
Single	14	—	—	—	—
Professional situation					
Unemployed	11	—	—	—	—
Employed/student	37	—	—	—	—
Retired (because of pain-related disability)	27	—	—	—	—
Retired (age)	25	—	—	—	—

RESULTS

Descriptive Information

Table 1 presents descriptive information for the sample. As can be seen, most of the samples were women (66%), with age ranging from 18 to 90 years (M = 60.97 y, SD = 15.40). Most of the participants were married or living with a significant other (62%). The remainder were widowed (16%), single (14%), or divorced/separated (8%). Education level tended to be low, with the majority of the participants (46%) having attended only primary education (which in Portugal consists of grades 1 to 4) and another 2% having never been to school. Only 11% of the participants had attended college. Most participants were retired (52%), with about half of these (27% of the sample) retired because of disability. Of the participants, 37% were employed. The majority of the participants had chronic pain for at least 2 years (69%), with 38% reporting pain for >10 years. About half of the participants reported having pain in >1 site of the body (53%). The most common pain locations for the individuals reporting only 1 site of pain were the lower limb (57%), followed by the back (33%), and the upper limb (11%).

As can be seen in Table 2, the sample was characterized by moderate levels of pain severity (NRS) and pain-related interference (P-BPI Interference). Overall, mean scores of SF-12 PCS and SF-12 MCS indicate significant physical and psychological dysfunction.[52] For the 171 participants who completed the P-PSEQ, self-efficacy belief level on average was in the high range (mean > 40), based on the proposed cutoffs,[61] and when compared with normative data sets for English-speaking individuals with chronic pain.[62] Another 142 participants completed the ESSS assessing perceived social support, resulting on an average score of 54.38 (SD = 11.49).

Associations Between Psychosocial Variables and Criterion Variables

Table 2 presents partial correlation coefficients between psychosocial variables and measures of functioning (pain intensity and pain interference) and physical and psychological functioning, controlling for sex and age. Self-efficacy was significantly associated with all criterion variables, showing negative associations with pain intensity and pain interference ($r = -0.25$ and -0.39, respectively), and positive associations with physical and psychological functioning ($r = 0.50$ and 0.45). Similarly, perceived social support showed a weak to moderate significant negative association with pain interference ($r = -0.24$), and moderate positive associations with physical and psychological functioning ($r = 0.33$ and 0.39, respectively).

Several of the CSQ-14 and CPCI-16 subscales were significantly associated with the criterion measures. Specifically, statistically significant moderate positive associations were found between pain interference and CSQ-14 Catastrophizing, CSQ-14 Praying/Hoping, CPCI-16 Guarding, CPCI-16 Resting, CPCI-16 Asking for Assistance, and CPCI-16 Relaxation, ($0.29 < r < 0.38$). Furthermore, significant moderate negative associations were found between physical functioning and CSQ-14 Catastrophizing, CSQ-14 Praying/Hoping, CPCI-16 Guarding, CPCI-16 Resting, CPCI-16 Asking for Assistance, CPCI-16 Relaxation, and CPCI-16 Support Seeking ($-0.34 < r < -0.51$), and between psychological functioning and CSQ-14 Catastrophizing, CPCI-16 Resting, and CPCI-16 Asking for Assistance ($-0.32 < r < -0.37$). Interestingly, only CPCI-16 Task Persistence was significantly (but weakly) positively correlated with both physical and psychological functioning status (both rs = 0.12).

Results of partial correlation coefficients between self-efficacy, social support, and coping responses, controlling for sex and age, are shown in Table 3. As can be seen, self-efficacy and perceived social support were significantly and positively associated ($r = 0.49$). In contrast, several of the CSQ-14 and CPCI-16 subscales were significantly and negatively associated with self-efficacy and perceived social support ($-0.41 < r$s < -0.25), with the strongest associations being those between CSQ-14 Catastrophizing and self-efficacy and perceived social support ($r = -0.40$ and -0.41, respectively), followed by the associations between CPCI-16 Guarding and self-efficacy and perceived social support (rs = -0.35). Only the CPCI-16 Task Persistence subscale yields moderate significant and positive associations with self-efficacy and perceived social support ($r = 0.46$ and 0.25, respectively).

Multivariate Regression Analysis: Associations Between Psychosocial Factors and Pain Intensity

Results of the multiple hierarchical regression analyses for pain intensity, as measured by the NRS, are presented

TABLE 2. Means and SDs for Study Measures and Partial Correlations (Controlling for Age and Sex) With the Criterion Variables

			Partial Correlations With			
	Mean (SD)	**Minimum-Maximum**	**NRS**	**P-BPI**	**PCS**	**MCS**
NRS	4.73 (2.19)	0-10	—	—	—	—
P-BPI Pain Interference	4.22 (2.53)	0-10	0.55[c]	—	—	—
SF-12 PCS	37.60 (23.31)	0-100	−0.43[c]	−0.60[c]	—	—
SF-12 MCS	55.29 (21.81)	0-100	−0.29[c]	−0.54[c]	0.56[c]	—
P-PSEQ	40.83 (11.32)	6-60	−0.25[c]	−0.39[c]	0.50[c]	0.45[c]
ESSS Total Score	54.37 (11.49)	17-75	−0.15	−0.24[b]	0.33[c]	0.39[c]
CSQ-14 subscales						
Diverting Attention	2.95 (1.87)	0-6	0.09	0.23[c]	−0.23[c]	−0.09
Reinterpreting Pain Sensations	2.33 (1.62)	0-6	0.11	0.20[c]	−0.07	−0.12[a]
Catastrophizing	2.43 (1.78)	0-6	0.18[b]	0.38[c]	−0.37[c]	−0.37[c]
Ignoring Sensations	2.53 (1.62)	0-6	0.02	0.12[a]	−0.02	−0.05
Praying/Hoping	2.96 (1.79)	0-6	0.08	0.29[c]	−0.34[c]	−0.25[c]
Coping Self-Statements	3.43 (1.56)	0-6	0.10	0.20[c]	−0.14[a]	0.02
Increasing Behavioral Activities	3.43 (1.56)	0-6	−0.03	0.01	−0.05	−0.01
CPCI-16 subscales						
Guarding	2.77 (2.11)	0-7	0.08	0.33[c]	−0.34[c]	−0.29[c]
Resting	3.04 (2.05)	0-7	0.13[a]	0.30[c]	−0.36[c]	−0.32[c]
Asking for Assistance	2.69 (2.39)	0-7	0.09	0.34[c]	−0.51[c]	−0.35[c]
Relaxation	3.79 (2.04)	0-7	0.15[b]	0.31[c]	−0.37[c]	−0.24[c]
Task persistence	3.90 (2.29)	0-7	−0.05	−0.05	0.12[a]	0.12[a]
Exercise/Stretch	3.92 (2.18)	0-7	0.07	0.24[c]	−0.26[c]	−0.20[c]
Seeking	2.63 (2.45)	0-7	0.02	0.17[b]	−0.35[c]	−0.22[c]
Coping Self-Statements	4.35 (2.05)	0-7	0.05	0.18[b]	−0.21[c]	−0.19[c]

[a]$P < 0.05$.
[b]$P < 0.01$.
[c]$P < 0.001$.

CPCI-16 indicates Chronic Pain Coping Inventory; CSQ-14, Coping Strategies Questionnaire; MCS, Mental Component Summary; NRS, Numerical Rating Scale; P-BPI, Portuguese Brief Pain Inventory Interference Scale; PCS, Physical Component Summary; P-PSEQ, Portuguese Pain Self-Efficacy Questionnaire.

in Table 4. In the first regression model that included coping responses as independent variables of pain intensity, both demographic variables explained 7% of the variance. When coping responses were added, they accounted for an additional, but not statistically significant, 3% of the variance in NRS ($f^2 = 0.03$). In the next regression model, which tests the predictive role of self-efficacy, the demographic variables explained 13% of the variance in NRS, and self-efficacy was also significantly associated with pain intensity, accounting for an additional and significant 5% of the variance ($f^2 = 0.06$). The last model examined the association between perceived social support and pain intensity. Demographic variables were significantly individually associated with pain intensity and accounted for 8% of the variance in NRS, and social support accounted for an additional (nonsignificant) 2% of the variance in the criterion variable ($f^2 = 0.02$).

TABLE 3. Partial Correlations (Controlling for Age and Sex) for Psychosocial Factors

	P-PSEQ	**ESSS Total Score**
P-PSEQ	—	0.49[c]
CSQ-14 subscales		
Diverting Attention	−0.15	−0.03
Reinterpreting Pain Sensations	−0.15	−0.14
Catastrophizing	−0.40[c]	−0.41[c]
Ignoring Sensations	0.19	0.07
Praying/Hoping	−0.30[a]	−0.05
Coping Self-Statements	−0.07	−0.01
Increasing Behavioral Activities	−0.03	0.04
CPCI-16 subscales		
Guarding	−0.35[b]	−0.35[c]
Resting	−0.23	−0.18
Asking for Assistance	−0.25[a]	−0.17
Relaxation	−0.13	0.05
Task Persistence	0.46[c]	0.25[a]
Exercise/Stretch	−0.26[b]	−0.18
Seeking	−0.21	0.06
Coping Self-Statements	−0.29[b]	−0.01

[a]$P < 0.05$.
[b]$P < 0.01$.
[c]$P < 0.001$.

CPCI-16 indicates Chronic Pain Coping Inventory; CSQ-14, Coping Strategies Questionnaire; P-PSEQ, Portuguese Pain Self-Efficacy Questionnaire.

Multivariate Regression Analysis: Associations Between Psychosocial Factors and Pain Interference

Table 4 presents the results of the regression analyses predicting pain interference. In the regression model including coping responses as independent variables, the demographic variables explained a significant 5% of the variance in the first step, and coping responses accounted for an additional and statistically significant 20% of variance in the criterion ($f^2 = 0.25$), representing a large variance explained by these independent variables. CSQ-14 Component 2 and CPCI-16 Illness-focused component were significantly independently associated with pain interference. In the second model, the demographic variable sex was significantly associated with pain interference (9% of variance explained). In step 2, self-efficacy accounted for an additional 5% of the variance ($f^2 = 0.17$). In the third regression, the demographic variables explained 10% of the

TABLE 4. Hierarchical Regression Analysis Predicting Pain Intensity and Pain Interference

	Total R^2	R^2 Change	*f* Change	β
Average pain in the past 24 h (NRS)				
Demographic variables	0.07	0.07	10.75[b]	
Age				0.16[a]
Sex				−0.21[b]
Coping responses	0.10	0.03	2.31	
CSQ-14 component 1				0.05
CSQ-14 component 2				0.12
CPCI-16 illness focused				0.09
CPCI-16 wellness focused				−0.01
Demographic variables	0.13	0.13	11.83[b]	
Age				0.22[a]
Sex				−0.27[b]
Self-efficacy	0.18	0.05	10.92[b]	−0.24[b]
Demographic variables	0.08	0.08	6.16[a]	
Age				0.22[a]
Sex				−0.17
General social support	0.10	0.02	3.19	−0.15
Pain interference (P-BPI Interference Scale)				
Demographic variables	0.05	0.05	7.04[b]	
Age				0.07
Sex				−0.21[b]
Coping responses	0.25	0.20	18.07[b]	
CSQ-14 component 1				0.13
CSQ-14 component 2				0.27[b]
CPCI-16 illness focused				0.25[b]
CPCI-16 wellness focused				0.03
Demographic variables	0.09	0.09	7.70[b]	
Age				0.14
Sex				−0.25[b]
Self-efficacy	0.14	0.05	29.98[b]	0.38[b]
Demographic variables	0.10	0.10	7.78[b]	
Age				0.07
Sex				−0.30[b]
General social support	0.15	0.05	7.85[b]	−0.23[a]

[a] $P < 0.01$.

[b] $P < 0.001$.

n for the several hierarchical regression analyses differ, with the models including coping responses being the ones with the large group (n = 298), followed by the 1 including self-efficacy (n = 142) and general social support (n = 142).

CPCI-16 indicates Chronic Pain Coping Inventory; CSQ-14, Coping Strategies Questionnaire; NRS, Numerical Rating Scale; P-BPI, Portuguese Brief Pain Inventory Interference Scale.

variance, and perceived social support accounted for an additional and statistically significant 5% of the variance in pain interference ($f^2 = 0.05$).

Multivariate Regression Analysis: Associations Between Psychosocial Factors and Physical Functioning

Table 5 presents the results of the multiple hierarchical regression analyses predicting physical functioning, as measured by the physical component of the SF-12 scale (PCS). In step 1 of the first model, the demographic variables explained 9% of the variance in the PCS scale, and coping accounted for an additional 30% of the variance ($f^2 = 0.42$), representing a large variance explained by coping responses. In the next model, the demographic variables explained 16% of the variance, and self-efficacy contributed to an additional and significant 5% of the variance ($f^2 = 0.26$). In the third model, the demographic variables accounted for 10% of the variance in step 1, and perceived social support contributed to an additional and statistically significant 10% of the variance in the PCS scale ($f^2 = 0.10$).

Multivariate Regression Analysis: Associations Between Psychosocial Factors and Psychological Functioning

The results of the regression analyses predicting psychological functioning, as measured by the mental component of the SF-12 scale (MCS), are presented on Table 5. In the first model, the demographic variables explained 5% of the variance in the first step, and the coping factors accounted for an additional 19% of variance in the criterion ($f^2 = 0.23$). In the next model, the demographic variables explained 6% of variance, and self-efficacy accounted for an additional 18% of the variance ($f^2 = 0.22$). Finally, in the last model, the demographic variables explained 7% of the variance in psychological functioning, and perceived social support made an additional significant contribution, accounting for an additional 13% of the variance ($f^2 = 0.42$).

DISCUSSION

The findings from this study provide limited support for the study hypotheses. Consistent with previous research on patients of other countries and

TABLE 5. Hierarchical Regression Analysis Predicting Physical and Psychological Functioning

	Total R^2	R^2 Change	*f* Change	β
Physical functioning (SF-12 physical component)				
Demographic variables	0.09	0.09	13.47[b]	
Age				−0.22[b]
Sex				0.19[b]
Coping responses	0.39	0.30	32.67[b]	
CSQ-14 component 1				−0.03
CSQ-14 component 2				−0.23[b]
CPCI-16 illness focused				−0.40[b]
CPCI-16 wellness focused				−0.09
Demographic variables	0.16	0.16	16.03[b]	
Age				−0.34[b]
Sex				0.20[a]
Self-efficacy	0.21	0.05	53.49[b]	0.46[b]
Demographic variables	0.10	0.10	7.72[b]	
Age				−0.16
Sex				0.26[b]
General social support	0.20	0.10	15.77[b]	0.31[b]
Psychological functioning (SF-12 mental component)				
Demographic variables	0.05	0.05	7.29[b]	
Age				−0.14
Sex				0.17[b]
Coping responses	0.24	0.19	16.58[b]	
CSQ-14 component 1				0.00
CSQ-14 component 2				−0.25[b]
CPCI-16 illness focused				−0.27[b]
CPCI-16 wellness focused				−0.04
Demographic variables	0.06	0.06	5.12[a]	
Sex				−0.15
Age				0.18
Self-efficacy	0.24	0.18	38.13[b]	0.43[b]
Demographic variables	0.07	0.07	4.96[a]	
Sex				−0.06
Age				0.25[a]
General social support	0.20	0.13	23.09[b]	0.38[b]

[a] $P < 0.01$.

[b] $P < 0.001$.

n for the several hierarchical regression analyses differ, with the models including coping responses being the ones with the large group (n = 298), followed by the 1 including self-efficacy (n = 142) and general social support (n = 142).

CPCI-16 indicates Chronic Pain Coping Inventory; CSQ-14, Coping Strategies Questionnaire.

cultures,[4,5,7,9,10,13,15–18,20,22,40,41,63–66] psychosocial factors were significantly associated with pain intensity, pain interference, and both physical and psychological functioning. Specifically, self-efficacy was significantly associated with all 4 criterion measures, and both perceived social support and coping responses were associated with pain interference, physical functioning, and psychological functioning in our Portuguese sample of individuals with chronic musculoskeletal pain. However, inconsistent with the study hypotheses, there was not a clear pattern of "adaptive" coping responses being significantly associated with lower levels of pain interference and higher levels of physical and psychological functioning. Instead, in our sample, virtually all coping responses, with the exception of task persistence, were positively associated with pain interference and negatively associated with physical and psychological functioning. In addition, although relatively few differences in the associations were found between our sample and English-speaking samples (mostly from the US), the few differences that did emerge are intriguing.

Consistent with previous research with Portuguese and US samples,[5,7,18,21,24,39] coping responses were not strongly associated with pain intensity. This finding is consistent across at least 2 cultures and suggests that the role of coping in enhancing or buffering the intensity of pain is likely to be minimal. These findings are also consistent with the results found in some studies conducted in other English-speaking countries and on non–English-speaking samples.[4,20,26,40,66]

Coping responses were, however, significantly associated with pain interference, psychological functioning, and physical functioning, with a large amount of variance of these dependent variables being explained by coping. As predicted, the measures of maladaptive coping (catastrophizing, pray/hope, guarding, resting, and asking for assistance) generally demonstrated the strongest associations with the criterion variables. This is consistent with previous research with US samples, and also with some of the findings in research on patients from other countries and cultures,[15,17,19,22,66] and suggests that there are a large number of associations between coping and adjustment that generalize across cultures.[15,17–19,21,22,24,32,37,66]

Two differences in the associations between pain-coping responses and measures of pain and functioning in a sample of patients from Portugal, relative to samples of patients from the US, emerged. First, the use of task persistence, usually negatively correlated with pain and dysfunction in English-speaking samples from the US,[5,7,18,21,23] showed only weak positive associations with physical and psychological functioning in our sample. Second, seeking social support, which has been shown to be inconsistently and weakly associated with pain interference and psychological functioning in the US samples,[5,18,21,23] showed a significant positive association with pain interference, and moderate negative associations with physical and psychological functioning in our sample. These differences could be attributed to a number of nonmutually exclusive factors, as previously noted by Ferreira-Valente et al,[39] as, for example, subtle differences between our sample and the English-speaking samples in other studies (eg, age differences, sex differences, or differences in some other factors, such as level of education). Nevertheless, although the English-speaking countries, including the US, tend to be multicultural and multiethnic societies, with different health and health insurance systems to those that prevail in Portugal, the most interesting possible explanations are related to cultural nuances.

Our findings partially replicate the findings previously found by our group in a different sample of Portuguese patients.[39] In both the previous and the current study, and unlike findings from research on the US patients, we found that task persistence was not significantly associated with measures of pain intensity, pain interference, and depression. One possible explanation for the discrepancies in the importance of task persistence as a coping response between patients from the US and patients from Portugal is that this last group may be more prone to depressive symptoms and hopelessness than people from the US, and that this might have an impact on the effects of task persistence on pain and functioning.[39] Consistent with this idea, the prevalence of depression in Portugal (about 20%)[67,68] is higher than that found in the US (about 5% to 9%).[69] In addition, as noted by Ferreira-Valente et al,[39] the Portuguese language is filled with words expressing melancholia, depressive feelings, and hopelessness. For example, Portuguese has a unique word (saudade) that has no correspondence with any word in any other language. This expresses the sadness associated with being apart from one's loved one. Another common Portuguese word is "fado," the name of a traditional Portuguese style of music. When a person from Portugal says "this is my *fado*," he/she express the disappointment and the impossibility of defeating fate: a view that negative life events cannot be changed, confronted, or defeated.

It is possible that this tendency toward melancholia among the Portuguese could act as a moderating factor that vitiates the positive impact of task persistence on pain and functioning; even among those who report relatively high levels of task persistence, there may also be high levels of helplessness and hopelessness, interfering with the potential (positive) impact of task persistence. Patients in the US may not have this characteristic to the same degree that Portuguese patients do, allowing for task persistence to have a greater beneficial impact. Of course, research would be needed to test this speculation. For example, in cross-cultural studies, researchers could determine whether increases in task persistence are associated with decreases in catastrophizing and disability in samples of individuals from the US, but not associated with decreases in catastrophizing and disability in samples of patients from Portugal.

A second possible reason for the differences in the importance of task persistence between patients from Portugal and patients from the US is that people from the 2 cultures might define "task persistence" differently. To the extent that Portuguese patients have worse economic status and sense of control over their lives, they may feel like they have no alternative but to persist at tasks and chores, including work, just to survive. When viewed as something that one *must* do, as opposed to something that one *chooses* to do, task persistence may not be "adaptive" and helpful. If this hypothesis is supported in future research, then pain treatment with Portuguese patients might need to help them identify when they might have a choice to persist in adaptive coping or not, helping them to define task persistence as an adaptive coping response, rather than a requirement for survival.

A second finding from our study that is inconsistent with the findings from English-speaking samples concerns the associations between the coping response of support seeking and measures of adjustment. Whereas these associations tend to be positive and weak in the US samples,[5,18,21,23] we found that social support seeking was associated with higher levels of pain and dysfunction in our sample. In addition, this pattern of associations is inconsistent with that found for *perceived social support* (which was associated with better functioning) in our sample. One possible explanation for the finding that support seeking may be maladaptive in Portuguese patients, but not in the USA samples, was advanced by Ferreira-Valente et al.[39] Specifically, we noted that, in Mediterranean culture, interpersonal relationships are given a very important role,[70–72] and *organic* communities[72] that encourage interdependence are developed. This could lead Portuguese patients to rely more than patients from the US on the community for support. If so, Portuguese patients, with greater impairment and pain-related distress, may seek more social support than those with better functioning, relying more on others' support to help them cope with pain and pain-related distress than patients from Anglo-Saxon (Northern) cultures.

A number of studies on English-speaking populations (conducted mostly in the US) have examined possible differences in pain-related coping responses between men and women, as well as between different ethnic groups. Although significant differences in the frequency of use of the different coping responses between ethnic groups sometimes emerge (with African Americans and Hispanics tending to use praying and hoping, catastrophizing, and diverting attention more often than whites),[12,33,34,41] these differences have been shown to become very small when groups are closely matched by age, sex, education level, and clinical status.[34] Moreover, the associations between coping and adjustment are similar between whites and African Americans.[41,73]

In contrast, more consistent differences have been found in the frequency of use of pain-coping responses between men and women. For example, women tend to catastrophize and seek social support more than men,[74,75] and men engage in active coping responses more than women.[76] However, the associations between pain-coping responses and adjustment to pain have been shown to be similar between men and women.[75,77] In short, although there may be differences in the frequency with individuals using different coping responses as a function of sex or ethnicity, the role that coping ultimately plays in adjustment is mostly similar. Nevertheless, it is important to keep potential sex and ethnicity effects in mind when interpreting the findings from the current study. Because the majority of our sample were whites, it is not possible to know with certainty how many of the differences that were found in coping between our sample and those from other studies were because of country effects (eg, Portuguese vs. US) or ethnicity differences (eg, white vs. other ethnicities). Further research examining the effects of country of origin, sex, and ethnicity is needed to help better understand the importance of each of these variables.

There are a number of other limitations that should be considered when interpreting the findings. First, we used a cross-sectional correlational design. Therefore, we were not able to make causal conclusions regarding the associations among the study variables. Future research should address questions of causality using both longitudinal and experimental designs. Second, the study sample was one of convenience, and its representativeness of the population of patients in Portugal with chronic musculoskeletal pain cannot be assumed. Thus, additional research is needed to determine the extent to which our findings generalize to other samples of patients from Portugal. Third, to minimize the assessment burden in this study, not all participants could complete all study measures. This approach did not allow us to examine the associations between all the psychosocial factors (coping, self-efficacy, and social support) and the criterion variables in the same analysis. As a result, we were not able to determine which psychosocial factor or factors are most important (and independent) relative to the others. Future researchers should consider administering measures of each of these domains to all participants in a study, perhaps using brief versions of measures when available, to minimize the assessment burden. Finally, the participants had pain problems stemming from a variety of chronic musculoskeletal conditions. It is possible that relationships between pain coping and adjustment to pain may be moderated,[78] at least partly, by pain etiology; thus, the strength of the associations may have been obscured by the use of such a heterogeneous sample.

Despite the study's limitations, however, the findings provide support for the importance of self-efficacy, social support, and coping responses in adjustment to chronic pain in the Portuguese samples. The findings also suggest the possibility that culture may moderate some of the associations between coping and adjustment, influencing the ways in which individuals react to pain. It is possible that coping strategies found to be adaptive and maladaptive in 1 culture are not necessarily similarly adaptive and maladaptive in another, for example, whereas previous research on English-speaking patients suggests that task persistence and support seeking may be adaptive and associated with positive outcomes; these same coping strategies were weakly or positively associated with negative outcomes in our sample.

However, given the high level of similarity for many of the associations between psychosocial variables and pain-related outcomes in our sample as well as those from the US, and consistently with the conclusions reached by previous cross-ethnic and cross-cultural studies,[15,24,31,34,38] the findings suggest that pain treatments developed to address psychosocial factors and shown to be effective in the US may also be effective in other countries and cultures, such as Portugal. However, some of the subtle cultural differences that were found suggest that wholesale import of these treatments may not be indicated; some adaptation may be necessary to ensure and maximize treatment efficacy.

REFERENCES

1. Breivik H, Collet B, Ventafridda V, et al. Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. *Eur J Pain*. 2006;10:287–333.
2. Hardt J, Jacobsen C, Goldberg J, et al. Prevalence of chronic pain in a representative sample in the United States. *Pain Med*. 2008;9:803–812.
3. Evers A, Kraaimaat F, Geenen R, et al. Pain coping and social support as predictors of long-term functional disability and pain in early rheumatoid arthritis. *Behav Res Ther*. 2003;41: 1295–1310.
4. López-Martínez AE, Esteve-Zarazaga R, Ramírez-Maestre C. Perceived social support and coping responses are independent variables explaining pain adjustment among chronic pain patients. *J Pain*. 2008;9:373–379.
5. Osborne TL, Jensen MP, Ehde DM, et al. Psychosocial factors associated with pain intensity, pain-related interference, and psychological functioning in persons with multiple sclerosis and pain. *Pain*. 2007;127:52–62.
6. Schütze R, Rees C, Preece M, et al. Low mindfulness predicts pain catastrophizing in a fear-avoidance model of chronic pain. *Pain*. 2010;148:120–127.
7. Tan G, Nguyen Q, Cardin SA, et al. Validating the use of two-item measures of pain beliefs and coping strategies for a veteran population. *J Pain*. 2006;7:252–260.
8. Van Damme S, Crombez G, Eccleston C. Coping with pain: a motivational perspective. *Pain*. 2008;139:1–4.
9. Asenlöf P, Söderlund A. A further investigation of the importance of pain cognition and behaviour in pain rehabilitation: longitudinal data suggest disability and fear of movement are most important. *Clin Rehabil*. 2010;24:422–430.
10. Costa L, Maher C, McAuley J, et al. Self-efficacy is more important than fear of movement in mediating the relationship between pain and disability in chronic low back pain. *Eur J Pain*. 2011;15:213–219.
11. Denison E, Asenlöf P, Sandborgh M, et al. Musculoskeletal pain in primary health care: subgroups based on pain intensity, disability, self-efficacy, and fear-avoidance variables. *J Pain*. 2007;8:67–74.
12. Jones AC, Kwoh CK, Groeneveld PW, et al. Investigating racial differences in coping with chronic osteoarthritis pain. *J Cross Cult Gerontol*. 2008;23:339–347.
13. Nicholas M. The pain self-efficacy questionnaire: taking pain into account. *Eur J Pain*. 2007;11:153–163.
14. Nicholson Perry K, Nicholas MK, Middleton J, et al. Psychological characteristics of people with spinal cord injury-related persisting pain referred to a tertiary pain management center. *J Rehabil Res Dev*. 2009;46:57–67.
15. Sardá J, Nicholas M, Asghari A, et al. The contribution of self-efficacy and depression to disability and work status in chronic pain patients: a comparison between Australian and Brazilian samples. *Eur J Pain*. 2009;13:189–195.
16. Woby S, Roach N, Urmston M, et al. The relation between cognitive factors and levels of pain and disability in chronic low back pain patients presenting for physiotherapy. *Eur J Pain*. 2007;11:869–877.
17. Garcia-Campayo J, Pascual A, Alda M, et al. Coping with fibromialgia: usefulness of the Chronic Pain Coping Inventory-42. *Pain*. 2007;132(suppl 1):S68–S76.
18. Jensen MP, Keefe FJ, Lefebvre JC, et al. One- and two-item measures of pain beliefs and coping strategies. *Pain*. 2003;104: 453–469.
19. Ko YM, Park WB, Lim JY. Cross-cultural adaptation and clinimetric property of Korean version of the Chronic Pain Coping Inventory-42 in patients with chronic low back pain. *Spine*. 2010;35:666–671.
20. McCraken L, Vowles K, Gauntlett-Gilbert J. A prospective investigation of acceptance and control-oriented coping with chronic pain. *J Behav Med*. 2007;30:339–349.
21. Miró J, Raichle KA, Carter GT, et al. Impact of biopsychosocial factors on chronic pain in persons with myotonic and

facioscapulohumeral muscular dystrophy. *AM J Hosp Palliat Care*. 2009;26:308–319.

22. Rodero B, Casanueva B, Luciano JV, et al. Relationship between behavioural coping strategies and acceptance in patients with fibromyalgia syndrome: elucidating targets of interventions. *BMC Musculoskelet Disord*. 2011;29:143–151.
23. Romano JM, Jensen MP, Turner JA. The chronic pain coping inventory-42: reliability and validity. *Pain*. 2003;104:65–73.
24. Tan G, Nguyen Q, Anderson KO, et al. Further validation of the Chronic Pain Coping Inventory. *J Pain*. 2005;6:29–40.
25. Tan G, Teo I, Anderson KO, et al. Adaptive versus maladaptive coping and beliefs and their relation to chronic pain adjustment. *Clin J Pain*. 2011;27:769–774.
26. Truchon M, Côté D. Predictive validity of the Chronic Pain Coping Inventory in subacute low back pain. *Pain*. 2005;116: 205–212.
27. Koleck M, Mazaux JM, Rascle N, et al. Psycho-social factors and coping strategies as predictors of evolution and quality of life in patients with low back pain: a prospective study. *Eur J Pain*. 2006;10:1–11.
28. Buenaver LF, Edwards RR, Haythornthwaite JA. Pain-related catastrophizing and perceived social responses: inter-relationships in the context of chronic pain. *Pain*. 2007;127:234–242.
29. Tsai P, Tak S, Moore C, et al. Testing a theory of chronic pain. *J Adv Nurs*. 2003;43:158–169.
30. Zaza C, Baine N. Cancer pain and psychological factors: a critical review of the literature. *J Pain Symptom Manage*. 2002;24:526–542.
31. Gecková A, van Dijk J, Stewart R, et al. Influence of social support on health among gender and socio-economic groups of adolescents. *Eur J Public Health*. 2003;13:44–50.
32. Shumaker S, Hill D. Gender differences in social support and physical health. *Health Psychol*. 1991;10:102–111.
33. Cano A, Mayo A, Ventimiglia M. Coping, pain severity, interference, and disability: the potential mediating and moderating roles of race and education. *J Pain*. 2006;7:869–870.
34. Edwards RR, Moric M, Husfeldt B, et al. Ethnic similarities and differences in the chronic pain experience: a comparison of African American, Hispanic, and white patients. *Pain Med*. 2005;6:88–98.
35. Jordan MS, Lumley MA, Leisen JC. The relationships of cognitive coping and pain control beliefs to pain and adjustment among African-American and Caucasian women with rheumatoid arthritis. *Arthritis Care Res*. 1998;11:80–88.
36. Hastie BA, Riley JL, Fillingin RB. Ethnic differences in pain coping: factor structure of the coping strategies questionnaire and coping strategies questionnaire-revised. *J Pain*. 2004;5:304–416.
37. Moore R, Brødsgaard I. Cross-cultural investigator of pain. In: Crombie IK, Croft PR, Linton SJ, LeResche L, Von Korff M, eds. *Epidemiology of Pain*. Seattle: IASP Press; 1999:53–80.
38. Novy DM, Nelson DV, Hetzel RD, et al. Coping with chronic pain: source of intrinsic and contextual variability. *J Behav Med*. 1998;21:19–34.
39. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP, et al. Coping with chronic musculoskeletal pain in Portugal and in the United States: a cross-cultural study. *Pain Med*. 2011;12:1470–1480.
40. Esteve R, Ramírez-Maestre C, López-Martínez A. Adjustment to chronic pain: the role of pain acceptance, coping strategies, and pain-related cognitions. *Ann Behav Med*. 2007;33:179–188.
41. Tan G, Jensen MP, Thornby J, et al. Ethnicity, control appraisal, coping and adjustment to chronic pain among black and white Americans. *Pain Med*. 2005;6:18–28.
42. Asghari A, Nicholas M. An investigation of pain self-efficacy beliefs in Iranian chronic pain patients: a preliminary validation of a translated English-language scale. *Pain Med*. 2009;10:619–632.
43. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Psychometric properties of the Portuguese version of the Pain Self-Efficacy Questionnaire. *Acta Reumatol Port*. 2011;36:260–267.
44. Lim H, Chen P, Wong T, et al. Validation of the Chinese version of pain self-efficacy questionnaire. *Anesth Analg*. 2007;104:918–923.
45. Nieto R, Miró J, Huguet A, et al. Are coping and catastrophising independently related to disability and depression in patients with whiplash associated disorders? *Disabil Rehabil*. 2011;33:389–398.
46. Denison E, Asenlöf P, Lindberg P. Self-efficacy fear avoidance, and pain intensity as predictors of disability in subacute and chronic musculoskeletal pain patients in primary health care. *Pain*. 2004;111:245–252.
47. Rahman A, Ambler G, Underwood M, et al. Important determinants of self-efficacy in patients with chronic musculoskeletal pain. *J Rheumatol*. 2004;31:1187–1192.
48. Rahman A, Reed E, Underwood M, et al. Factors affecting self-efficacy and pain intensity in patients with chronic musculoskeletal pain seen in a specialist rheumatology pain clinic. *Rheumatology*. 2008;47:1803–1808.
49. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Validity of Four Pain Intensity Rating Scales. *Pain*. 2011;152: 2399–2404.
50. Jensen MP. Measurement of pain. In: Fishman SM, Ballantyne JC, Rathmell JP, eds. *Bonica's Management of Pain*. 4th eds. Media, PA: Williams & Wilkins; 2010:251–270.
51. Azevedo LF, Pereira AC, Dias C, et al. Tradução, adaptação cultural e estudo multicêntrico de validação de instrumentos para rastreio e avaliação do impacto da dor crónica [Translation, cultural adaptation and multicentric validation study of measures of screening and assessment of the impact of chronic pain]. *Dor*. 2007;15:6–37.
52. Cleeland CS, Ryan KM. Pain assessment: global use of the Brief Pain Inventory. *Ann Acad Med Singapore*. 1994;23: 129–138.
53. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Further validation of a Portuguese version of the Brief Pain Inventory Interference Scale. *Clinica y Salud*. 2012;23:89–96.
54. Pais-Ribeiro JL. *O importante é a saúde: estudo de adaptação de um instrumento para avaliar o estado de saúde [The important is health: study of the adaptation of a measure to assess health status]*. Lisboa: Fundação Merck Sharp & Dohme; 2005.
55. Pais-Ribeiro JL. Escala de Satisfação com o Suporte Social (ESSS) [Satisfaction with Social Support Scale (ESSS)]. *Anal Psicol*. 1999;3:547–558.
56. Santos C, Ribeiro JL, Lopes C. Estudo de adaptação da Escala de Satisfação com o Suporte Social (ESSS) a pessoas com diagnóstico de doença oncológica [Adaptation of the Satisfaction with Social Support Scale (ESSS) to oncological patients]. *Psicologia, Saúde e Doenças*. 2003;4:185–204.
57. Ferreira-Valente M, Pais-Ribeiro J, Jensen M. Coping with chronic musculoskeletal pain: preliminary validation of the Portuguese version of the two two-item measures. *Psychol Health*. 2009;24(suppl 1):171. [Abst].
58. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. New York, NY: Lawrence Erlbaum Associates; 1988.
59. Jensen M, Turner J, Romano J. Changes in beliefs, catastrophizing and coping are associated with improvement in multidisciplinary pain treatment. *J Consult Clin Psychol*. 2001;69: 655–662.
60. Nieto R, Raichle K, Jensen M, et al. Changes in pain-related psychosocial variables predict changes in outcomes in individuals with myotonic muscular dystrophy and facioscapulohumeral dystrophy. *Clin J Pain*. 2012;28:47–54.
61. Tabachnick B, Fidell L. *Using Multivariate Statistics*. 3rd ed. New York: HarperCollins College Publishers; 1996.
62. Jensen MP, Turner JA, Romano JM, et al. The chronic pain coping inventory: development and preliminary validation. *Pain*. 1995;60:203–216.
63. Tonkin L. The pain self-efficay questionnaire. (Appsaisal: Clinimetrics). *Aust J Physiother*. 2008;54:77.
64. Nicholas M, Asghari A, Blyth F. What do the numbers mean? Normative data in chronic pain measures. *Pain*. 2008;134:158–173.
65. Wong WS, Jensen MP, Mak KH, et al. Preliminary psychometric properties of the Chinese version of the Chronic

Pain Coping Inventory (ChCPCI) in a Hong Kong Chinese population. *J Pain*. 2005;11:672–680.

66. Karsdorp PA, Vlaeyen JW. Active avoidance but not activity pacing is associated with disability in fibromyalgia. *Pain*. 2009;25:29–35.
67. Bento A, Carreira M, Heitor MJ. Síntese dos resultados preliminares [Synthesis of the preliminary results]. *Saúde em Números*. 2003;16:1–12.
68. Gusmão RM, Xavier M, Heitor MJ, et al. O Peso das Perturbações Depressivas. Aspectos epidemiológicos globais e necessidades de informação em Portugal [The burden of the depressive disorders. Global epidemiological aspects and information requierments in Portugal]. *Acta Med Port*. 2005;18:129–146.
69. CDC. Current depression among adults—United States, 2006 and 2008. *MMWR Morb Mortal Wkly Rep*. 2010;59:1229–1235.
70. McIntyre T. Family therapy in Portugal and the US: a culturally sensitive approach. In: Gielen U, Comunian A, eds. *Family and Family Therapy in International Perspective*. Milan, Italy: Marinelli Editrice; 1997.
71. McIntyre TM, McIntyre SE, Silverio J. Stress responses and coping resources on nurses. *Anal Psicol*. 1999;3:513–527.
72. Rokach A, Neto F. Coping with loneliness in adolescence: a cross-cultural study [Stress responses and coping resources on nurses]. *Soc Behav Pers Int J*. 2000;28:329–341.
73. Jordan MS, Lumley M, Leisen J. The relationships of cognitive coping and pain control beliefs to pain and adjustment among African-American and Caucasian women with rheumatoid arthritis. *Arthritis Care Res*. 1998;11:80–88.
74. Tamres L, Janicki D, Helgeson V. Sex differences in coping behavior: a meta-analytic review and an examination of relative coping. *Pers Soc Psychol Rev*. 2002;6:2–30.
75. Keogh E, Eccleston C. Sex differences in adolescent chronic pain and pain-related coping. *Pain*. 2006;123:275–284.
76. Ramírez-Maestre C, López-Martínez A, Esteve R. Personality characteristics as differential variables of the pain experience. *J Behav Med*. 2004;27:147–165.
77. Kaczynski K, Claar R, Logan D. Testing gender as a moderator of associations between psychosocial variables and functional disability in children and adolescents with chronic pain. *J Pediatr Psychol*. 2009;34:738–748.
78. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Does chronic pain diagnosis moderate the association between psychosocial factors and functioning? *Eur J Pain*. 2011;5: 71. [Abst].