Coping with chronic musculoskeletal pain in Portugal and in the USA: A cross-cultural study

Running Title: Coping with pain in Portugal and USA

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Abstract

Objective. The aim of this study was to examine the associations between coping and adjustment to chronic pain in a sample of patients from Portugal, and discuss the findings with respect to published findings from two studies using patients from the USA.

Design. Two brief measures of pain coping were translated and administered with measures of physical and psychological functioning to a sample of Portuguese patients. Analyses examined the associations among the study variables, and compared the results with published data from two patient samples from the USA.

Participants. 117 individuals with chronic musculoskeletal pain.

Outcome measures. Portuguese translations of brief versions of the Coping Strategies Questionnaire and Chronic Pain Coping Inventory and criterion measures of pain intensity, pain interference and depression.

Results. Statistically significant positive associations were found between measures of patient dysfunction and Catastrophizing, Praying/Hoping, Guarding, Asking for Assistance, Support Seeking, and negative associations were found between the criterion measures and Ignoring Sensations, Coping Self-Statements and Increasing Behavioral Activities. Mean differences between the Portuguese and USA samples in the coping scales were found for nine of the 15 coping scales.

Conclusions. The results support the reliability and validity of the translated Coping Strategies Questionnaire and Chronic Pain coping Inventory, and also indicate a number of similarities, but also some interesting differences, in the findings from the Portuguese versus USA samples, suggesting that there may be cultural differences in how people cope with pain.

Key words: Chronic Pain; Cross-Cultural Research; Coping; Catastrophizing

Introduction

Biopsychosocial models of chronic pain hypothesize coping responses as one of several key variables that explain adjustment differences among individuals with chronic pain [1]. Consistent with a biopsychosocial approach, research performed mostly in the in English-speaking patients in the USA has shown pain coping responses to be consistently associated with physical and psychological functioning and with treatment outcome, across a wide variety of chronic pain conditions [2-7].

Pain coping responses can be classified as “adaptive” (those coping responses thought to contribute to positive functioning) and “maladaptive” (those thought to contribute to dysfunction). The coping responses most strongly and consistently associated with patient functioning, at least in English speaking samples from the USA, include the adaptive response of task persistence and maladaptive responses of guarding, pain-contingent rest, asking for assistance, praying/hoping and catastrophizing [3,8-11]. However, coping is likely to be a situation and culturally-determined variable, and what may be adaptive (or maladaptive) and most important in one culture may or may not be adaptive (or maladaptive) in another [12,13]. An important, but as yet unanswered, question concerns the generalizability of pain coping research across languages and cultures.

The primary aim of the current study was to examine the associations between translated versions of the brief versions of the Chronic Pain Coping Inventory (CPCI) [9] and Coping Strategies Questionnaire (CSQ) [9] and measures of pain intensity, pain interference, depression and anxiety, in a sample of patients with chronic pain from Portugal, and discuss the findings relative to existing studies with samples of English speaking patients from the USA [9,14]. If the findings from previous studies using patients from the USA were to replicate in a sample of Portuguese patients, we anticipate that (1) both adaptive and maladaptive coping responses would generally show weak associations with measures of pain intensity, with the exception of the Catastrophizing, which usually shows moderate to strong positive associations with pain intensity [3,9,11]. We also anticipate that (2) the CSQ and CPCI coping responses classified as adaptive would tend to show negative associations with measures of dysfunction (pain interference and psychological functioning), and (3) those classified as maladaptive would tend to show positive associations with measures of dysfunction, with the measures of maladaptive responses (in particular, Guarding, Resting, Asking for Assistance, and Catastrophizing) showing stronger associations than measures of adaptive responses. However, we also anticipate that (4) some cultural differences might exist in the use of different coping strategies, as well as their associations with functioning domains. We did not make any specific *a priori* hypotheses about these possible differences, due to the lack of published pain coping cross-cultural research, particularly comparing samples from Portugal and the USA.

Methods

Participants

All 117 participants were adult patients with chronic musculoskeletal pain. Study inclusion criteria included: (1) participation as an inpatient or outpatients in the Departments of Orthopedics or Physical Medicine and Rehabilitation of two hospitals in northern and central Portugal; (2) being 18 years old or older; (3) having a musculoskeletal pain condition diagnosed by the referral physician; (4) experiencing pain for at least 6 months; and (5) not having a physical or cognitive disability that would prevent participation.

Table 1 presents demographic data regarding our sample. As can be seen, most of the sample was female (70.9%), aged between 20 and 85 years of age (M = 55.78 years, SD = 15.03). The majority of the study participants (62.1%) were married or living with a significant other. Level of education tended to be low, with the majority of the participants having attended only primary education

(57.0%) and another 5.1% of participants being illiterate. Most of the subjects had a history of chronic pain for at least two years (64.9%), and 33.3% reported having had pain for more than 10 years. A considerable number of participants reported having pain in two or three regions of the body (33.3%), or even four or more locations of pain (13.2%). The most common pain locations were the hip (26.3%), knee (20.2%), and back or low back (21.9%).

[Insert Table 1 about here]

Comparison Samples: Sample Characteristics

Two samples of English speaking patients from the USA were selected from published studies [9,14] and were used as comparison samples.

The first sample consisted of 141 patients with chronic pain that had been recruited from patients participating in multidisciplinary pain treatment at the University of Washington [9]. The mean age of these participants was 44.7 years, and 51% were female (see Table 2). The purpose of this previously published study was to evaluate the validity of brief measures of several measures of pain beliefs and coping, including the CSQ and CPCI. Prior to initial evaluation at the University of Washington Multidisciplinary Center, participants were mailed and completed measures of pain beliefs and coping strategies, pain intensity (0-10 NRS) and functioning (Center of Epidemiological Studies Depression Scale, CES-D; and Roland-Morris Disability Questionnaire, RMDQ). Correlations between the coping strategies as measured by the two-items per scale versions of the CSQ and CPCI and the criterion measures were computed and are presented on Tables 3 and 4.

[Insert Tables 2, 3 and 4 about here]

The second comparison sample was composed of 563 veterans, mostly men (90.3%), who were referred to the Integrated Pain Management Program of the Michael E. DeBakey Veterans Affairs Medical Center. They had a mean age 50.8 years (SD=11.4 years) (see Table 2) [14]. The purpose of this previously published study was to examine the utility of 3 brief versions of common pain belief and coping measures, including the two-items per scale versions of the CSQ and CPCI (see Tables 3 and 4). The criterion measures used in this study included the CES-D, RMDQ and the Interference Scale (MPIIF) of the West Haven-Yale Multidimensional Pain Inventory (WHYMPI).

Measures

Participants were asked to provide information regarding demographics and pain history information, pain intensity, pain interference, pain coping, and depression, and anxiety, using self-report questionnaires.

Pain intensity was assessed using the Visual Analogue Scale (VAS) [15]. The VAS used in this study consisted of a horizontal line 100 mm in length, with the end points "No pain" and "Worst possible pain" placed at each end of the line. Respondents were asked to make a mark on the line that indicated their usual pain in the past week. Research supports the validity of the VAS as a measure of pain intensity through its strong association with other pain intensity measures, and responsivity to treatments known to impact pain [16-18].

Pain interference was assessed using the Portuguese version of the Brief Pain Inventory Interference Scale [19]. With this scale, respondents are asked to indicate the relative interference of pain in seven activities (general activity, mood, walking ability, normal work, relations with other people, sleep, enjoyment of life) on 0 to 10 numerical rating scale, with 0 = "does not interfere" and 10 = "interferes completely." A great deal of evidence supports the validity and reliability of the BPI interference scale across many samples, cultures, and translations [20]. The Portuguese version used in this study demonstrated good reliability (Cronbach's alpha = 0.82) and predictive validity, via statistically significant correlations with measures of physical (SF-12 Physical Component Summary: r = -0.42) and psychological functioning (SF-12 Mental Component Summary: r = -0.45; HADS Anxiety Scale: r = 0.50; HADS Depression Scale: r = 0.31), in the preliminary validation for the Portuguese population study [19]. The same study indicated that this version of BPI Interference Scale has factorial validity, via confirmatory factor analysis that yielded a one-factor solution ($\chi^2(14) = 25.13$, ($p<0.03$), CFI = 0.93; RMSEA =0.09, 95% confidence interval 0.02 – 0.15).

Coping with pain was assessed using Portuguese translations of the brief (two-items per domain) versions of the Chronic Pain Coping Inventory (CPCI) and Coping Strategies Questionnaire (CSQ) [9,21], two of the most commonly used measures of pain coping responses in research and clinical settings. The brief CPCI lists 16 pain coping responses, grouped into eight domains (guarding, resting, asking for assistance, relaxation, task persistence, exercise/stretch, seek support and coping self statements). Respondents are asked to indicate the number of days in the past seven that they used each coping response to deal with pain, and the two items per scale are averaged to compute a scale score for each coping domain. The brief versions of the CPCI scales have shown validity through their strong association ($r \geq 0.70$) with the corresponding scales of the original version, as well as in the pattern of associations with pain-related variables [9].

The two-items per scale version of the CSQ (includes 14 coping items, grouped into seven coping domains (diverting attention, reinterpreting pain sensations, ignoring pain, praying and hoping, coping self statements, catastrophizing and increasing behavioral activities). Respondents are asked to indicate the frequency with which they use each of the coping responses when in pain on a 7-point Likert scale (ranging from "never do" to "always do that"). The two-items per scale version has demonstrated validity through the strong association of the subscales (all rs ≥ 0.70) with the corresponding subscales of the original CSQ version [9].

Depression and anxiety were assessed using the Portuguese version of the 14-item Hospital Anxiety and Depression Scale (HADS) [22]. Respondents are asked to indicate the severity of each symptom on a 4-point Likert scale. The HADS is a commonly used measure that has a great deal of evidence supporting its reliability and validity [23,24]. Evidence for the reliability of the Portuguese version comes from the validation study showing good internal consistency of the scales (Cronbach's alpha of 0.76 and 0.81, for anxiety and depression scales respectively) [22].

Comparison Samples: Measures Used

The CES-D was used in both of the studies using patients from the USA to assess the presence and severity of depressive symptoms. It is a 20-item measure of depressive symptoms with a great deal of evidence supporting its reliability and convergent and criterion validity [25]. There are no published studies comparing this measure with the HADS (used in the current study) in Portuguese samples. However, researchers have compared the CES-D and HADS in samples of patients from the UK, Japan and USA [26-28], supporting a strong association between the CES-D and HADS (rs range, 0.66 to 0.68) [27,28], indicating that they measure related constructs. .

The RMDQ [29] is a commonly used 24-item measure that assesses disability associated with chronic pain. Evidence supports its validity and reliability [29,30]. No previous studies have compared this measure with the BPI Interference Scale (used in the current study) in Portuguese samples. However, one study using patients from the USA patients has shown a strong correlation between the RMDQ and BPI Interference Scale (r = 0.57) [31].

Finally, the WHYMPI is a 56-item measure assessing the impact of pain on the patient's life, the patient's view of how significant others respond to their communication of pain and the patient's general activity level. Its validity and reliability is well established for patients with chronic pain in the USA [32]. For the purpose of the current our study, only the means and standard deviations of the Interference Scale of the WHYMPI (MPIIF) assessing the extent to which pain interfered with daily functioning was considered for the comparison analyses. No data are available that compares this measure with the BPI Interference scale, although both were developed to assess the same domain.

Procedure

Translation. The initial phase of the study involved translating and back-translating the instructions and items of the brief CPCI and CSQ. Through expert discussion, we arrived at a consensus version of each measure, and verified that the content of the translated versions evaluated the same construct as the original. We then performed a pre-test of the measures in a pilot sample, followed by a cognitive debriefing, to verify that individuals with chronic pain in the population understood the instructions and scale items. After making any final changes in the measures based on the pilot testing, we invited samples of inpatients and outpatients with chronic pain to complete all of the study measures. After signing the informed consent, all participants completed the VAS, P-BPI Interference Scale, CPCI and CSQ questionnaires. Of the 117 participants, only the inpatients were asked to complete the HADS (36 did so), to minimize assessment burden for the outpatients, because they did not have time to complete the entire questionnaire packet as they were waiting for their physical therapy sessions to start. Subjects who were unable to read or write were assisted by the investigators in completing the measures.

Data analysis. We first computed the means and standard deviations of all of the study variables for descriptive purposes. Next, to test the hypothesized associations between coping responses and patient functioning, we computed Pearson correlation coefficients between the brief CSQ and CPCI scales and measures of pain and psychological functioning. We then compared the results of the correlation analyses in the current sample with those from previous studies that examined patients from the USA. Finally, we used series of t-tests to compare the frequencies of use of each coping strategy in our sample with one of the USA samples which study presents those results [14]. 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 two items. A single missing response from the 7-item for BPI Interference scale was replaced by the mean of the other items, although if more than one BPI Interference scale item was missing, the entire scale was excluded from the analyses. There were no missing data for VAS or HADS scale. All statistical analyses were performed using PASW Statistics 18 (v. 18, SPSS Inc. Chicago, IL).

Results

Descriptive information

The means and standard deviations of the study variables are presented in Table 5. The sample was characterized by moderately high levels of pain intensity. Overall, pain-related interference (P-BPI Interference Scale) was moderate, and the mean scores on the HADS suggested mild levels of anxiety and depression.

[Insert Table 5 about here]

Associations between the brief CSQ and CPCI scales and criterion variables

The Pearson correlation coefficients computed between the CSQ and CPCI scale scores and the validity criterion measures from the current Portuguese sample, as well as from two USA samples, are presented in Tables 3 and 4. As can be seen, in the current (Portuguese) sample, statistically significant positive associations were found between pain intensity and the CSQ Catastrophizing scale, and between pain interference and CSQ Catastrophizing, CSQ Praying/Hoping, CPCI Guarding, CPCI Resting, CPCI Asking for Assistance and CPCI Support Seeking. A significant negative association was found between pain interference and CSQ Ignoring Sensations. Regarding psychological dysfunction, a significant positive association was observed between anxiety and CSQ Catastrophizing, and between depression and CSQ Catastrophizing, and also negative associations between depression and CSQ Praying/Hoping, CSQ Coping Self-Statements and CSQ Increasing Behavioral Activities.

Because the same measures were not used to assess the criterion variables in our sample and the USA samples, direct statistical comparison in the strengths of the associations between the CSQ/CPCI scales and the measures of pain intensity, pain interference, and psychological functioning are not appropriate. However, an observation of the direction and strength of the associations reported in Tables 3 and 4 indicate many similarities, but also some differences, in the *patterns* of associations between the CSQ and CPCI scales and the criterion variables between the Portuguese and USA samples. In the CSQ scales, the primary differences were associated with the Praying/Hoping and Increasing Behavioral Activities scale, which were both associated negatively and moderately with depression in the Portuguese sample, and either not significantly (for CSQ Praying/Hoping) or only weakly (for CSQ Increasing Behavioral Activities) with depression in the USA samples. In the CPCI scales, the primary differences were associated with the Task Persistence and Seeking Social Support scales. The Task Persistence scale was only weakly (and not significantly) associated negatively with the criterion variables in the Portuguese sample, whereas this scale was associated significantly and negatively with all three criterion variables in the USA samples. On the other hand, Seeking Social

Support was associated positively and significantly with pain interference in the Portuguese sample, but only very weakly and not significant with pain interference in the USA samples.

Mean differences between the Portuguese and USA samples in the brief CSQ and CPCI scales

The one sample t-tests computed between CSQ and CPCI scales scores of our sample and a USA sample [14], show statistically significant ($p < .05$) differences between samples in nine of the 15 coping scales, as presented in Table 1. Specifically, statistically significant differences were found between USA and Portuguese samples for the CSQ Diverting Attention, CSQ Catastrophizing, CSQ Ignoring Sensations, CSQ Praying/Hoping, CPCI Guarding, CPCI Resting, CPCI Task Persistence, with the Portuguese sample having a lower frequency of their use, on average, and CSQ Increasing Behavioral Activities and CPCI Exercise/Stretch, with the Portuguese sample having a higher frequency of use of these coping responses, on average.

Discussion

The findings of this study provide support for the study hypotheses; that is, we found a number of similarities to and some 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 USA. The findings have important implications for understanding how individuals with chronic pain from different cultures might respond differently to pain, and possible cross-cultural differences in the importance and impact of different coping responses on patient functioning.

As hypothesized, the measures of coping showed weak associations with pain intensity in our sample. The only significant association to emerge was associated with the CSQ Catastrophizing scale, although the strength of the association found (r = 0.19) was weak and fell between the associations found by Tan and colleagues [14] (r = 0.09) and Jensen and colleagues [9] (r = 0.31) in English speaking samples from the USA. To the extent that a significant association between variables is a necessary, but not sufficient, condition for causality, the present findings suggest that none of the coping responses assessed, other than *perhaps* catastrophizing, contribute to pain severity or pain relief in patients in the USA and in Portugal. Thus, although catastrophizing has been hypothesized to contribute to the severity of pain [33], and preliminary evidence supports this hypothesis, at least in English speaking samples [34], the current findings suggest that its role in enhancing the intensity of pain, if present, is likely to be slight.

We also hypothesized that the CSQ and CPCI coping responses usually viewed as adaptive would tend to show negative associations with measures of dysfunction and that those classified as maladaptive would tend to show positive associations with measures of dysfunction, with CPCI Guarding, CPCI Resting, CPCI Asking for Assistance, and CSQ Catastrophizing scales showing the strongest associations overall. Our findings were generally consistent with this hypothesis. Of the 12 statistically significant associations that emerged in the correlational analyses, 10 were in the hypothesized directions and were consistent with the findings from studies using patients from the USA. The two measures that were not consistent with our hypothesis, or with findings from the USA samples, were associated with the CSQ Praying/Hoping scale and CPCI Seeking Social Support scale.

Thus, the findings indicate that there are a large number of associations between coping and adjustment that generalize across cultures (at least, to individuals with chronic pain from the USA and from Portugal), although the findings also raise the intriguing possibility that some cultural differences in the relationships between coping and adjustment may exist. The associations that appear to generalize across cultures include the generally weak associations between coping use and pain intensity, as well as the stronger and statistically significant associations between measures of guarding, resting, asking for assistance, catastrophizing, ignoring sensations, coping self-statements and increasing behavioral activities, and measures of pain interference (for all coping scales listed) and depression (especially for catastrophizing, ignoring sensations, coping self-statements, and increasing behavioral activities). Also, the significant associations found are consistent with the previous labeling of these coping responses as adaptive versus maladaptive; that is, the use of guarding, resting, and asking for assistance are all associated positively with measures of dysfunction, and the use of catastrophizing ignoring sensations, coping self-statements, and increasing behavioral activities shows the opposite pattern to the measures of functioning used in this study.

Consistent with the findings from previous research in English speaking samples from the USA, we found that use of praying/hoping was positively associated with pain interference. Another pattern of findings that appears to be consistent across cultures and is consistent with one of our study hypotheses is that coping strategies that are generally viewed as maladaptive were more strongly associated with measures of functioning than those generally viewed as adaptive. For example, use of guarding, resting and asking for assistance were strongly associated with dysfunction in our sample, while exercise and coping self-statements were only weakly and inconsistently associated with functioning in our sample, as they are in samples from the USA. The consistency of these relationships across measures, languages, and cultures speaks to their generalizability.

On the other hand, some intriguing differences in the associations found suggest the possibility that there may be some important cultural differences between our sample and English speaking individuals with chronic pain. Four differences stood out. First, use of task persistence, which is often significantly associated negatively with measures of pain and dysfunction in English speaking samples [9,14] was not significantly associated with any criterion measure in our sample. Second, use of seeking social support, which tends to be inconsistently and weakly associated with pain interference in English speaking samples [9,14], moderately and positively associated with pain interference in our sample. Third, use of praying and hoping tends to show a weak (but positively) association with depression in English speaking samples [9,14]. However, it showed a moderately large *negative* association with depression in our sample. Finally, use of increasing behavioral activities shows an inconsistent and generally weak association with depression in English speaking samples [9,14]. In our sample, however, it showed a moderately strong negative association (r = -0.41).

The differences found between our sample and patients from the USA could be due to a number of (non-mutually exclusive) factors. For example, it is possible that there are subtle differences in the psychometric properties of the translated scales used in this study, compared to the English versions of the measures, which may influence the direction and strength of associations found. It is also possible that differences exist between our sample and the English speaking samples in other studies that are unrelated to culture *per se*; for example, age differences, sex differences, or differences in some other factors, such as level of education, that were not measured in this or other studies. In fact, the Portuguese sample has lower level of education than the USA sample for which this data are available, and this can be might explain, at least in part, some of the differences found between the samples. Nonetheless, some of the more interesting possible explanations for the differences found are related to cultural differences. The hypothesis that cultural differences may exist in pain coping responses was partially supported by the many mean score differences found between our Portuguese sample and an English speaking sample in the CSQ and CPCI scales. We speculate about some of these cultural differences below.

For example, we can speculate that the Roman Catholic background of the Portuguese population, for example, may make the use of praying and hoping more salient, and this may impact the strength of the associations between these coping responses and measures of pain and functioning. As mentioned above, in English speaking samples, use of this strategy generally shows a weak positive association with pain interference [9,14], but no consistent association with measures of psychological functioning. In our sample, however, we found a positive and statistically significant association between this coping response and pain interference, as well as a stronger and statistically significant *negative* association with depression. Due to the tendency for praying/hoping to be positively associated with dysfunction in research in this area, it is often viewed as representing a passive and maladaptive coping response that may contribute to dysfunction and disability [8,35]. However, in Portuguese culture, many people may view pain as an atonement for their sins, and may therefore be more willing or able to tolerate it. It is possible that the positive association found between praying/hoping and pain interference in our study (as well as in English speaking samples) may be due to the fact that people who suffer more intense pain and pain-related interference tend to turn to prayer and hope as a way to manage something that they perceive as uncontrollable. On the other hand, perhaps among Portuguese individuals more than individuals in the USA, use of prayer and hope may provide some psychological relief, and may therefore be an effective way to deal with the negative emotional impact of pain. For many Portuguese, prayer might not be viewed as a coping strategy, but more simply as a familiar way of life [36].

The stronger negative association that we found between increasing activities and depression in our sample, relative to USA samples, may be related to the possibility that Portuguese individuals are less introspective, and may therefore use less self-reflection or “rational” coping strategies than North Americans do [36-38]. As a result, Portuguese as a group may have a tendency to deal with distress by the use of distracting activities (in order to become less aware of their suffering). This possibility is partially supported by the finding that increasing behavioral activities, as well as use of exercise and task persistence, are among the coping strategies used most often by our Portuguese sample (as opposed to what is observed in English speaking samples, in which the coping responses used most often are coping self-statements, guarding and resting) [see 14,39,40].

Another cultural difference which could explain, at least in part, the associations we found between support seeking and pain interference, is the possibility that in Mediterranean culture, strong interpersonal relationships are a very strong cultural value [41,42]. In these cultures, in fact, *organic* communities, as defined by Rokach and Neto [37], are developed, which allow each person to be interdependent. Perhaps more in Portugal than in he USA, the individual relies on the community for support, and as a result may have a stronger feeling of belonging and reciprocal sharing. Also, within such a culture support seeking may result in actually receiving more support; that it, it may be more effective that in a more autonomous culture. In contrast, in North America (more of an *atomist* community) a greater emphasis is placed on autonomy and individual success, so individuals in the USA who seek support may not find that it is as effective as a coping strategy; North Americans may, in fact, experience greater shame when feeling the need for support, and therefore be less likely to develop intimate relationships [37].

Regardless of the frequency with which support seeking is used, the findings linking this coping response to measures of patient functioning is inconsistent across all studies. Some studies, whether using an English speaking sample [39] or a Spanish sample of patients with chronic pain [5], show social support to be associated with higher levels of pain [5,39,43], whereas in other studies (with USA samples), no significant association was reported [9,14].

Some coping responses (namely, task persistence) found to be associated with pain and depression in USA samples [9,14,39] were not found to predict patient functioning in the current study. This may be due to the possibility that Portuguese patients may simply not view these as effective strategies for dealing with pain and depression. The Portuguese tradition and lexicon leans towards negative and melancholic affect, and there may therefore be an associated general hopelessness and helplessness about one’s ability to manage distress among Portuguese. For example, Portuguese have a unique word with no lexical correspondence in other languages, which expresses the feelings derived from the experience of being apart from one's loved one: "saudade".

This tendency is also exemplified by the word *fado* (a traditional type of Portuguese song, whose approximate meaning is "fate") which is viewed as the cause of all life events, expressing the idea that every sadness and suffering Portuguese experience as a people and individually is due to external and uncontrollable causes. A general tendency to experience and have a melancholic and depressive attitude toward life among the Portuguese is also partially supported by a depression prevalence of about 20% of the Portuguese population [44], which is on the higher range of the average prevalence of 5% to 25% in the USA [45]. Thus, it is possible that among Portuguese, because of a cultural tendency towards melancholy and depression, as well as a tendency to give up in front of stressful events (attributed to uncontrollable causes and impossible to change), depression and distress may be more difficult to manage. Therefore, coping strategies that might be helpful for managing depression in the USA (such as task persistence and ignoring sensations), might not be as effective in Portugal.

On the other hand, the results do support cultural differences in the frequency of use of different coping strategies, with the Portuguese sample tending to use more active coping strategies to cope with pain, such as CSQ Increasing Behavioral Activities, CPCI Task Persistence, and CPCI Exercise/Stretch, and the USA sample tending to use more coping strategies such as CSQ Praying/Hoping, CSQ Diverting Attention, CPCI Guarding, and CPCI Resting. These results, yet preliminary and in need of further study and confirmation, provide further support for the potential influence of culture on the ways in which individuals react to pain.

Given the similarities found between our study and previously published studies, however, it is reasonable to expect that pain treatments developed and shown to be effective in the USA may also be effective in other cultures, including Portugal. However, the fact that some differences were found in the associations between coping and adjustment to chronic pain in our sample, compared to English speaking samples, suggests that coping strategies found to be adaptive and maladaptive in one culture may not always be similarly adaptive and maladaptive in another. Therefore, it may be important to adapt pain treatment programs from one culture to another, rather than merely translate them.

This study has a number of limitations that should be taken into account when considering the results. First, we did not assess test-retest stability of the scales to estimate their reliability. This is particularly important to do given the fact that one of the more common estimates of reliability (Cronbach's alpha) is not appropriate for scales with very few items. Future research is needed to establish the test-retest reliability of the translated versions of the CSQ and CPCI scales used in this study. Second, this is the first article providing data regarding the use of the coping measures versions used in a Portuguese sample of patients with chronic pain, as no previous data regarding the validity of the coping measures Portuguese versions used in this study has been published. Additional research is therefore needed to confirm the validity of the Portuguese versions of the CSQ and CPCI measures used in this study. Third, the criterion measures of pain intensity, pain interference and depression used in this study and in the studies from which the USA samples derived, are not the same. Although the measures assess similar constructs, it is possible that the fact that different measures were used could impacts the strengths of the associations found. Forth, this study relies exclusively on self-report measures, some of which may have been difficult to complete reliably for some of the study participants (e.g., the elderly and less educated participants) [46]. Fifth, to avoid increasing the burden of the patients when completing the questionnaires, just a subgroup of 36 participants completed also the HADS, thus this consists a limitation when considering the predictive validity of the CPCI and CSQ in its association to psychological functioning and comparing the present results with other studies. A final limitation concerns the fact that the patients of our sample had pain problems stemming from a number of etiologies, although all the participants had musculoskeletal pain. It is possible that the relationships between pain coping and adjustment to pain may be moderated, at least in part, by pain type or pain diagnosis. Thus, stronger (or weaker) relationships may have been obscured by the use of such a heterogeneous sample.

Despite the study’s limitations, however, the findings provide preliminary support for the validity of the Portuguese version of the brief (two-item) CPCI and CSQ, and suggests that many, but not all, of the relationships found between coping and adjustment in English speaking samples from the USA replicate in individuals with chronic pain living in Portugal. Further research is needed to establish the reliability of the Portuguese versions of the CPCI and CSQ, and to replicate the associations found in this study.

Acknowledgments

The authors gratefully acknowledge to Hospital da Prelada – Dr. Domingos Braga da Cruz, Hospital de Ovar – Dr. Francisco Zagalo and the contributions of Filipa Vieira, José António Almeida and Conceição Graça. M. Alexandra Ferreira-Valente has received PhD grant SFRH/BD/ 40956/2007 in the past year from the Portuguese Foundation for Science and Technology. Mark P. Jensen has received research support, consulting fees, or honoraria in the past year from Endo, Fralex, Medtronic, Merck, Pfizer, Smith & Nephew, US Department of Education, US Department of Veterans Affairs, and the US National Institutes of Health.

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