Adjustment to Chronic Pain: The Role of Pain Acceptance, Coping Strategies, and Pain-Related Cognitions

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ABSTRACT

Background: *Previous research has found that acceptance of pain is more successful than coping variables in predicting adjustment to pain.* ***Purpose:*** *To compare the influence of acceptance, pain-related cognitions and coping in adjustment to chronic pain.* ***Methods:*** *One hundred seventeen chronic pain patients attending the Clinical Pain Unit were administered a battery of questionnaires assessing pain acceptance, active and passive coping, pain-related cognitions, and adjustment.* ***Results:*** *The influence of acceptance, coping, and cognition on all the adjustment variables was considered simultaneously via Structural Equation Modeling using LISREL 8.30 software. A multigroup analysis showed that the male and female samples did not significantly differ regarding path coefficients. The final model showed that acceptance of pain determined functional status and functional impairment. However, coping measures had a significant influence on measures of emotional distress. Catastrophizing self-statements significantly influenced reported pain intensity and anxiety; resourcefulness beliefs had a negative and significant influence on depression.* ***Conclusions:*** *These findings suggest that acceptance may play a critical role in the maintenance of functioning and, with this aim, acceptance-based treatments are promising to avoid the development of disability. They also lend support to the role of control beliefs and of active coping to maintain a positive mood. Acceptance and coping are presented as complementary approaches.*

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INTRODUCTION

Acceptance is emerging as a valuable concept in contemporary theories on how patients adapt to chronic pain (1). When Keefe, Rumble, Scipio, Giordano, and Perri (2) analyzed the "state of the art" regarding the psychological aspects of persistent pain, they highlighted acceptance as one of the key factors that has recently received a considerable amount of attention and which has important clinical implications for pain management. In fact, an "Acceptance and Commitment Therapy" (ACT) manual specifically aimed at chronic pain patients has been recently published (3) and there is some evidence supporting the efficacy of this approach to improve emotional and physical functioning in such patients (4,5).

Acceptance of pain includes responding to pain-related experiences without attempts at control or avoidance, particularly when these attempts have limited the patient's quality of life, and engaging in valued activities and reaching personal goals regardless of these experiences (6). Several early studies showed that acceptance was associated with better adjustment to chronic pain, although later research revealed that the relationship between acceptance and adjustment is complex. McCracken (7) found that greater acceptance of pain was associated with reports of lower pain intensity, less pain-related anxiety and avoidance, less depression, less physical and psychosocial disability, more daily uptime, and better work status. Acceptance also predicted better adjustment independently of perceived pain intensity. Nevertheless, Viane et al. (8) found that acceptance predicted mental well-being but did not account for physical functioning. McCracken, Spertus, Janeck, Sinclair, and Wetzel (9) showed that anxiety and acceptance distinguished dysfunctional patients from adaptive copers. Viane, Crombez, Eccleston, Devulder, and De Corte (10) found that acceptance was related to less attention to pain, more engagement with daily activities, higher motivation regarding complete activities and better efficacy in the performance of daily activities. It is interesting to note that these results were obtained with a measure of acceptance different to the one used in most other studies which usually applied the Pain Acceptance Questionnaire (11). Finally, a recent prospective study supported the strong relationship between acceptance of pain and healthy functioning that had been previously found in cross-sectional studies (6).

Several experimental pain studies have compared the behavioral and subjective impact of a control-based

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rationale versus an acceptance rationale. Acceptance-based interventions attempt to teach clients to feel emotions and bodily sensations more fully and without avoidance, and to notice fully the presence of thoughts without following, resisting, believing or disbelieving them (12). Using a cold pressor test, it was found that participants in the acceptance group demonstrated greater tolerance to pain compared to the control-based group (13–17). Feldner et al. (18) found that individuals reporting higher levels of experiential avoidance had lower pain endurance and tolerance and recovered more slowly from a cold pressor test. An experimental study with individuals with chronic low back pain showed that a short acceptance-based intervention improved physical functioning (19). At the same time, other experimental studies showed that control strategies aimed at suppressing pain-related thoughts produced paradoxical and counterproductive effects (20,21). The experimental evidence highlighted that acceptance is not simply a new psychological variable but a description of a different set of processes of pain and suffering (1). The core mechanism of acceptance is to alter the relationship between pain-related cognitions and overt behavior; automatic thoughts and feelings (such as the thought "I can't stand this pain") are disconnected from actions and the participant makes behavioral choices that are congruent with valued life changes. On the other hand, experiential avoidance is a process in which an individual attempts to change the form or frequency of a private event that he or she is unwilling to experience. Experiential avoidance is theorized to be a broad-based affective diathesis that is involved in a variety of psychiatric problems (22). Although experiential avoidance is effective in the short term, in the long term it seriously limits quality of life. Most of the actions of the patients with chronic pain are aimed at avoiding pain sensations and emotions, thoughts, or memories associated with pain, but paradoxically, as has been widely documented (23,24), avoidant behavior leads to disability.

There is some discussion in the literature as to the extent to which this model is independent or complementary to current cognitive-behavioral models. In fact, when Hayes, Strosahl, and Wilson (12) analyzed the philosophical and theoretical foundations of ACT, they referred to evidence from the coping styles literature and equated experiential avoidance with emotion-focused avoidant coping strategies.

The direction toward which control is exerted is crucial in analyzing the difference between the constructs of coping and acceptance. McCracken and Eccleston (25,26) highlighted the meaning of coping as struggling to alter an aversive event (pain) or one's reaction to an aversive event (25) as opposed to acceptance. On the other hand, acceptance does not mean giving up, substituting *control* for *no-control*; acceptance means to change the target of control from uncontrollable events (pain itself and related negative emotions) to controllable factors (12), that is, behavior change entailing better daily function despite pain. Coping with pain is directly trying to change pain, and what the person feels and thinks about pain. Acceptance of pain is directing efforts toward functioning and living, acceptance is "coping" with life or "coping" with the results of pain.

McCracken and Eccleston (25,26) found that in predicting pain, depression, disability, pain-related anxiety, and the patient's physical and vocational functioning, pain acceptance was more successful than coping variables. Both studies used the Coping Strategies Questionnaire (27) but did not include the catastrophizing scale in the predictive analyses, the authors arguing that catastrophizing is distinct from coping measures. There have been discussions on whether catastrophizing may best be viewed as a coping strategy, a belief, or an appraisal process (28,29). In this study, catastrophizing is conceptualized as an appraisal process and it is measured accordingly. Apart from such definitional issues, its current importance is undeniable; catastrophizing is considered to be one of the strongest predictors of adjustment to pain and could account for some of the similar variance in outcome as is explained by acceptance. The same could be stated about other pain-related cognitions such as helplessness, whose importance in predicting adjustment to chronic pain is nowadays generally admitted (2) and must be taken into account to obtain an accurate picture of the predictive power of acceptance.

There is growing interest in sex and gender differences in pain perception and response. The evidence, however, is inconclusive because whereas some studies indicated that males and females differ in their perception and experience of pain (30–32), a recent study did not find differences in experimental pain perception (33). Of particular relevance is that male and female individuals tend to use different coping strategies when dealing with pain (33–38). For the purpose of this study, another recent study is of interest which showed that acceptance instructions resulted in lower sensory pain reports in both men and women. Nevertheless, for affective pain, acceptance instructions only benefited women (39).

The main aim of this study was to replicate and extend the findings of previous studies which compared acceptance of chronic pain and coping with chronic pain in predicting adjustment as measured by anxiety, depression, functional status, functional impairment, and reported pain intensity (25,26). These studies used the Coping Strategies Questionnaire (27); a different measure of coping, the Vanderbilt Pain Management Inventory (40,41), was applied in this study to test the generalizability of previous findings. Following the suggestions of some authors (2), the influence of pain acceptance was also tested in comparison with a specific measure of catastrophizing and other pain-related cognitions.

Finally, previous studies performed consecutive regression analyses. In this study, Structural Equation Modeling

was performed, which enables the simultaneous consideration of the influence of all the exogenous variables on all the endogenous variables. In order to compare the relative influence of pain acceptance, coping, and pain-related cognitions on adjustment, a hypothetical model was tested in which all these exogenous variables influence anxiety, depression, functional status, functional impairment, and reported pain intensity. In addition, all the exogenous variables were assumed to be correlated.

Taking into account the results of the aforementioned studies (25,26), it is postulated that pain acceptance would demonstrate a greater influence on adjustment than coping and pain-related cognitions. An additional aim of this study was to determine whether gender moderates the relationships between coping, pain-related cognitions, acceptance and adjustment to chronic pain.

METHOD

Participants

The participants consisted of a consecutive sample of 117 chronic pain patients who attended the Clinical Pain Unit at the Carlos Haya University Hospital in Málaga (Spain). Individuals were considered eligible for the study if they had experienced pain for at least 6 months and were not being treated for a terminal illness. None of them refused participation.

There were more women in our sample than men (28.7% male, 71.3% female). On average, participants were 54 years old ($SD = 11.34$). Only 30.7% of the sample reported a high school education or better. At the time of the study, 56.4% were retired and 66% were married.

Etiology and pain site varied among study participants: 29.80% reported back pain; 25% reported widespread pain; 20.20% reported joint pain as their primary complaint; head or face, 9.60%; cervical, 6%; lower limbs, 3.60%; upper limbs, 2.40%; and thoracic pain, 3.40%. Mean pain duration was 11.49 years ($SD = 10.06$), with 57.4% of participants receiving at least some disability allowance for their pain. Pain medication use was reported by 100% of the participants (4 medicines on average) and 44% reported at least one surgical intervention to relieve pain. As previous studies showed, in relation to demographic and clinical variables this sample can be considered representative of all patients who attend this clinic and other Spanish Pain Units (42).

Procedure

Each participant had a semistructured interview with a psychologist to collect relevant demographic, social, or medical history data. A battery of questionnaires, including the measures described in the following, was also completed for each participant. The patients were administered the measures prior to any treatment at the clinic.

The research project—of which this study is a part—was approved by the Carlos Haya Hospital Ethics Committee. Informed consent was obtained prior to data collection. Participants were aware that the information collected was confidential.

Measures

Demographic and Pain-Related Variables

Each participant was interviewed and provided information about a number of demographic and pain-related variables including circumstances of pain onset, time in pain, medications and other medical treatments, medical consultations and surgery related to pain, and receiving financial assistance for their pain.

Acceptance

The Spanish Version of the Chronic Pain Acceptance Questionnaire (CPAQ) was applied (11,43). A number of studies support the internal consistency and validity of the CPAQ as a measure of acceptance of chronic pain (7,11,43,44). The inventory is made up of 24 items that are rated on a 0 (*never true*) to 6 (*always true*) scale. In the validation study, the instrument showed appropriate internal consistency ($\alpha = .83$) (43).

Pain-Related Cognitions

The Pain-Related Self-Statement Scale (PRSS) and the Pain-Related Control Scale (PRCS) were applied. Flor, Behle, and Birbaumer (45) developed both scales based on the differentiation of underlying schemata and situation-specific self-statements. The PRCS assesses the underlying cognitive schemata of pain patients: cognitive schemata are based on past experience with specific situations which would contain the individual's stored knowledge about the world and guide the organization of incoming information. On the other hand, the PRSS assesses situation-specific cognitions that either promote or hinder attempts to cope with pain.

The PRSS is made up of two subscales: Catastrophizing Self-Statements (*negative statements*, 9 items) and Coping Self-Statements (*positive statements*, 9 items). The PRCS is composed of two subscales: Helplessness Beliefs, that is, 7 items referring to beliefs about uncontrollability and unpredictability; and Resourcefulness Beliefs, that is, 8 items assessing beliefs regarding the controllability and predictability of pain. All four subscales proved to be reliable, sensitive to change, and valid in relation to predicting pain outcomes (45).

The PRSS and the PRCS were adapted into Spanish (46). In the validation studies, the scales showed adequate reliability (Catastrophizing Self-Statements, $\alpha = 0.88$; Coping Self-Statements, $\alpha = 0.92$; Helplessness Beliefs, $a = 0.83$; Resourcefulness Beliefs, $\alpha = 0.77$). Factor analysis supported the internal structure postulated by the authors of

the original version. Pain-related cognitions were also significantly associated with measures of pain intensity, depression and disability.

Pain Coping Strategies: Active Coping and Passive Coping

The Vanderbilt Pain Management Inventory (VPMI) by Brown and Nicassio (40,41) was applied. This 18-item instrument asks patients to rate the frequency with which they use coping strategies when their pain reaches a moderate or greater level of intensity on a 5-point scale. The VPMI is made up of two scales: Active Coping and Passive Coping.

Following Brown and Nicassio's (40) procedure, active and passive dimensions of coping were identified in the Spanish Version and both scales showed adequate internal consistency; $\alpha = 0.80$ for Active Coping, and $\alpha = 0.82$ for Passive Coping (41) in several validation studies. The authors classified coping strategies as adaptive (active) or maladaptive (passive) based on their relationship to indices of pain and psychosocial functioning: (a) active coping, where patients attempt to control their pain or to function in spite of their pain; and (b) passive coping, where patients relinquish control of their pain to others, or allow other areas of their life to be adversely affected by pain.

Anxiety and Depression

The Hospital Anxiety and Depression Scale (HADS) is a 14-item, self-reporting scale that contains two 7-item Likert scales, one for anxiety and one for depression (47). The HADS is a practical screening tool for identifying and quantifying anxiety and depression in the medical out-patient clinic for nonpsychiatric patients.

The Spanish Version of the scale shows appropriate reliability and validity. The validation studies showed that the internal consistency of both scales is high ($\alpha = 0.86$ for anxiety; $\alpha = 0.86$ for depression) (48). The use of this instrument is strongly recommended to assess anxiety and depression in chronic pain populations (49), as it does not include items of a somatic nature that can give false positives.

Functional Status and Functional Impairment

The Impairment and Functioning Inventory (IFI) is composed of 37 items each referring to an activity related to one of the following areas: household, autonomy behaviors, leisure, and social relationships (50). First, the patients are asked if they have performed an activity last week and if they answer in the affirmative, they are asked about frequency. If they answer in the negative, they are asked if they practiced this activity before suffering chronic pain. This system enables differentiating between present *functioning* and *impairment* and offers advantages in assessing patients with a long history of pain where the degree of deterioration is at least as informative as the current level of functioning. The IFI has been specifically developed for patients with chronic pain and takes into account the distinguishing features of Spanish culture.

The instrument gives an index of functioning, an index of impairment, and scores for each of these areas. Several psychometric studies revealed that the subscales and the global scales were highly reliable (functional status $\alpha = 0.84$; functional impairment, $\alpha = 0.85$). Factor analytic techniques supported the hypothesized internal structure (50).

Pain Intensity

A self-monitoring technique was used. The patients were asked to register their pain intensity at home. They were instructed to record their present pain intensity on a numeric rating scale ranging from 0 (*no pain*) to 10 (*pain as bad as you can imagine*). This had to be done three times per day, after breakfast, lunch, and dinner. An average pain intensity score was calculated for the week.

RESULTS

Model Test

The influence of all the exogenous variables on all the endogenous variables was considered simultaneously via Structural Equation Modeling using LISREL 8.30 software (51). Prior to analyses the data were checked and no problems were encountered regarding the shape of the frequency distributions or outliers. The variables were normally distributed and the estimation method was Maximum Likelihood. Analyses were performed on the covariance matrix.

The following exogenous variables were included: coping measures (Passive Coping and Active Coping), pain-related cognitions (Coping Self-Statements, Catastrophizing Self-Statements, Helplessness Beliefs, Resourcefulness Beliefs), and acceptance. Endogenous variables were anxiety, depression, functional status, functional impairment, and pain intensity. Causal paths were defined from each exogenous variable to each of the five endogenous variables. All residual variances were assumed to be uncorrelated and all exogenous variables were assumed to be correlated.

Table 1 shows the standardized coefficients of the model. As can be observed, acceptance mainly determined functional status and functional impairment. Passive and active coping mainly influenced anxiety and depression, respectively. On the other hand, catastrophizing mainly influenced anxiety, functional impairment, and pain intensity.

Gender Moderator Effects

A LISREL multigroup analysis was carried out for the hypothetical model to determine whether gender moderates

TABLE 1
Initial Model. Standardized Coefficients

	Endogenous Variables				
Exogenous Variables	*Anxiety*	*Depression*	*Functional Status*	*Functional Impairment*	*Pain Intensity*
Passive coping	.25	.16	−.03	.05	.08
Active coping	−.11	−.22	.12	−.03	−.14
Coping self-statements	.07	.02	.14	.00	−.11
Catastrophizing self-statements	.26	.10	−.02	.25	.24
Helplessness beliefs	.10	.15	−.03	.21	.08
Resourcefulness beliefs	.01	−.16	.08	−.13	−.03
Acceptance	.06	−.18	.40	−.44	−.04

the relationships between coping, pain-related cognitions, acceptance, and adjustment to chronic pain. The LISREL multigroup analysis offers the possibility of studying a model with more than one sample. Furthermore, multigroup LISREL analysis provides a chi-square value and its accompanying degrees of freedom as a goodness-of-fit index of the model for the groups considered simultaneously.

The first step involves a "multiple-group" solution in which it is assumed that all the model's parameters are invariant across groups, $\chi^2(60) = 95.39$. That is, path coefficients and error variances are assumed to be the same in the male and the female sample. In the following step, it is assumed that both samples differ in path coefficients and error variances are assumed to be equal between groups, $\chi^2(25) = 71.72$. Finally, the third step consists in assuming that path coefficients and error variances are different in both samples, $\chi^2(20) = 50.44$.

To test each hypothesis about the similarity or invariance of the models in various groups the chi-square difference was considered. Chi-square and the degrees of freedom did not decrease significantly from Step 1 to 2 when path coefficients were assumed to be different in both groups, $\Delta\chi^2(35) = 23.67$. However, from Step 2 to 3, there was a significant drop, $\Delta\chi^2(5) = 21.28$, $p > .001$. This suggests that, in fact, it is the error variances that differ between groups and not the path coefficients.

Final Model

To obtain a parsimonious model, all paths of the initial model that were not statistically significant were deleted. For this reason, two pain-related cognitions variables were excluded from the model; coping self-statements and helplessness beliefs. Because men and women did not significantly differ in the path coefficients, the model was fitted for the whole sample.

In addition, three relationships suggested by the modification indexes were included; specifically, a path from pain intensity to depression; a path from functional impairment to functional status; and a path from pain intensity to functional impairment. All the suggested paths are plausible and refer to relationships between the endogenous variables that were not considered in the initial model. Inspection of model diagnostics revealed that the sole source of poor fit was the assumption of uncorrelated residuals for the two emotional distress measures, anxiety and depression. Two strategies were considered for dealing with this. One strategy was to model the two emotional distress measures as indicators of a common latent variable to reflect a more global construct of emotional distress. This strategy was rejected because further analysis also made it evident that the two variables were differentially related to other constructs in the model. Treating them as indicators of the same underlying construct would obscure these differences. The second strategy was to maintain the conceptual distinctions between the variables while permitting the residuals to be correlated. Taking into account that both anxiety and depression were measured with the same instrument (HADS), the latter strategy seems justified and an error covariance between depression and anxiety was added (.27). Figure 1 represents the final model.

Rectangles are observed (measured) variables, circles are standardized error variances, values in parentheses are unstandardized path coefficients, values not in parentheses are standardized path coefficients, straight lines with arrows are presumed causal paths. All exogenous variables (passive coping, active coping, catastrophizing self-statements, resourcefulness beliefs and acceptance) were assumed to be correlated, but these correlations are omitted from the diagram to reduce clutter.

To avoid clutter the correlations between all the exogenous variables are omitted from Figure 1. Acceptance had a strong positive relationship with active coping ($r = .54$) and also a positive relationship with resourcefulness beliefs ($r = .32$). Acceptance was negatively correlated with passive coping ($r = -.38$) and catastrophizing self-statements ($r = -.38$). On the other hand, active coping was negatively related to passive coping ($r = -.47$) and catastrophizing self-statements ($r = -.48$), and positively to resourcefulness beliefs ($r = .38$). Passive coping has a strong positive relationship with catastrophizing self-statements ($r = .64$) and a weaker negative relationship with resourcefulness beliefs ($r = -.18$). Finally,

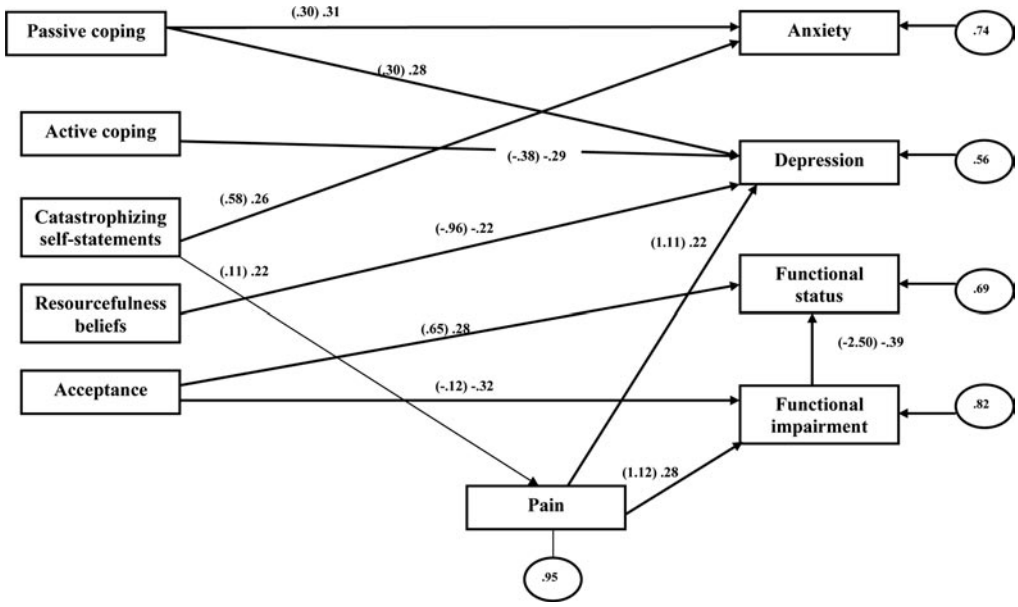

FIGURE 1 Final model.

catastrophizing self-statements showed a negative relationship with resourcefulness beliefs ($r = -.27$).

All path coefficients were statistically significant ($p < .05$). The final model accounts for 26%, 44%, 31%, 18%, and 5% of the variance of scores on anxiety, depression, functional status, functional impairment, and pain intensity, respectively. As can be seen in Table 2, the various goodness-of-fit indexes (GFIs) calculated for the SEM indicated that the estimated model provided a good fit to the data. The chi-square fit index was statistically nonsignificant, which is consistent with an excellent model fit. The GFI and the adjusted goodness-of-fit index (AGFI), which range between 0 and 1, showed high values, which is associated with being a good fit of the final model. The value for the root mean square error of approximation (RMSEA) was smaller than 0.08 and the close fit test was nonsignificant, which is considered to indicate a good fit of the model. For the standardized root mean square residual (SRMR) the smaller the value, the better the model fit, with the smallest possible value being zero. Finally, according to the comparative fit index (CFI), which ranges from 0 (*absolute lack of fit*) to 1 (*perfect fit*), the final model showed a perfect fit.

TABLE 2
Goodness-of-Fit Indexes for the Final Model

Goodness-of-Fit Indexes	
Chi-square ($df = 23$)	9.56*
Goodness-of-fit index	.96
Adjusted goodness-of-fit index	.90
Root mean square error of approximation	.00**
Root mean square residual	15.12
Standardized root mean square residual	.058
Comparative fit index	1.00

*$p = .99$. **$p = 1.00$.

As can be observed (Figure 1), passive coping yielded two statistically significant path coefficients. The first was to anxiety, with individuals characterized by higher levels of passive coping reporting higher levels of anxiety. Passive coping also had statistically significant effects on depression because individuals with higher levels of passive coping report higher levels of depression. The only statistically significant path coefficient for active coping was to depression; higher levels of active coping were associated with lower levels of depression.

Catastrophizing self-statements yielded two statistically significant path coefficients. The first was to anxiety, with individuals characterized by higher levels of catastrophizing self-statements reporting higher levels of anxiety. Higher levels of catastrophizing self-statements were also associated with higher levels of pain intensity. Moreover, catastrophizing self-statements had two indirect effects on depression and on functional impairment due to the mediating role of pain intensity.

There was a statistically significant path coefficient between resourcefulness beliefs and depression, with depression tending to decrease as resourcefulness beliefs increase. Acceptance yielded two statistically significant path coefficients. The first was to functional status, with individuals characterized by higher levels of acceptance reporting higher levels of functional status. Acceptance also had statistically significant effects on functional impairment, with functional impairment tending to decrease as acceptance increased. Some of the effect of acceptance on functional status was due to the mediating role of functional impairment, that is, because individuals with higher levels of acceptance report

lower levels of functional impairment and because those with higher levels of functional impairment report lower levels of functional status, it follows that those with higher levels of acceptance also report higher levels of functional status. However, the model in Figure 1 suggests that the effect of acceptance on functional impairment cannot completely account for the effects of acceptance on functional status. Rather, acceptance seems to have an independent effect on functional status irrespective of functional impairment.

Finally, pain intensity yielded two statistically significant path coefficients. The first was to depression, with individuals who reported higher levels of pain intensity also reporting higher levels of depression. The second effect was to functional impairment, with individuals characterized by higher levels of pain intensity reporting higher levels of functional impairment.

DISCUSSION

The purpose of this study was to compare acceptance of chronic pain, pain-related cognitions and coping in predicting adjustment to chronic pain. In brief, this study found that acceptance of pain determined the variables related to activity, that is, functional status and functional impairment. On the other hand, the coping measures had a significant influence on measures of emotional distress. It should be noted that catastrophizing self-statements was the only variable with a significant influence on pain intensity and which also significantly influenced anxiety. Resourcefulness beliefs had a negative and significant influence on depression. According to our results, gender did not moderate the aforementioned relationships.

The final adjusted model clearly highlights the relationship between acceptance and functioning as it is the only variable with a significant influence on functional status and functional impairment. In addition, acceptance did not influence reported pain intensity. This is an expected result as acceptance entails ''doing with pain,'' meaning that an individual has to maintain functioning and participate in activities in daily life even while continuing to experience pain (44). The study by Risdon, Eccleston, Crombez, and McCracken (52) showed that a core task of acceptance is refocusing on nonpain topics and maximizing other aspects of life despite pain. McCracken (53) reported that the primary component of acceptance for chronic patients was how far they engage in normal life activities. The association of acceptance with less disability is a consolidated finding (7,9,25) except for the study by Viane et al. (8) who explained the absence of relationship on the basis of the unreliability of the measure of physical functioning for chronic pain populations.

On the other hand, catastrophizing self-statements is the only variable in the final model with a significant influence on reported pain intensity and, via pain intensity, it also has indirect effects over depression and functional impairment. One of the most consistent findings in the literature has been that catastrophizing is associated with heightened pain experience (36). The final model also showed that catastrophizing self-statements had a significant influence on anxiety. The relationship of catastrophizing with anxiety is also a consolidated finding (36), especially with pain-related anxiety (54). Some authors have even argued that there is a content overlap between catastrophizing and constructs related to anxiety (55); nevertheless, some findings indicate that although catastrophizing is correlated with various indices of emotional distress, it appears to contribute unique variance to the prediction of pain and disability (36). Moreover, the relationship between catastrophizing and emotional distress seems complex and, in this sense, it is interesting to note that in this study catastrophizing self-statements did not directly influence depression but did influence depression through pain intensity. In any case, in the light of our results, it seems clear that to obtain an accurate picture of the role of acceptance on adjustment its influence must be considered together with catastrophizing (2).

Previous studies found a negative relation between pain acceptance and emotional distress (7–9,25,26). In this study, however, emotional distress is determined by the coping measures and pain-related cognitions. Specifically, higher levels of catastrophizing self-statements and passive coping were associated with higher levels of anxiety. In contrast to previous studies where the role of the active coping strategies was not clear (56), according to our results, when active coping is practiced the level of depression decreases. In addition, resourcefulness beliefs, the belief in controllability and predictability of pain, also seems to counteract depression. The role of resourcefulness beliefs highlights the importance of the concept of control in relation to acceptance. According to Hayes and Wilson (57), in general, an accepting attitude implies giving up the struggle to control one's thoughts and feelings, and therefore, resourcefulness beliefs should be negatively associated with acceptance. However, McCracken (58) did not find evidence in support of this idea in patients with chronic pain, and Viane et al. (8) found that the belief that controlling thoughts and feelings diminished pain was even positively related to the construct of acceptance. In this line, McCracken and Eccleston (25) have indicated that the relationship between acceptance and control pain is complex because the target for control attempts is crucial. Tan, Jensen, Robinson-Whelen, Thornby, and Monga (59) showed that perceived control over the effects of pain or life in general are more important correlates of functioning than perceptions of control over pain itself. Adopting a more accepting stance concerning pain may lead chronic pain patients to a stronger sense of general self-control (60). In addition, following a treatment designed to enhance control over pain, patients with chronic pain reported enhanced acceptance of pain (11). To clarify the relationships between acceptance and beliefs regarding

control, it is important to reiterate that acceptance does not mean substituting *control* for *no-control*; acceptance means changing the focus of control from uncontrollable events (pain itself) to controllable factors (13).

It is also worth commenting on the relationships between the exogenous variables in the final model. Acceptance had a strong relationship with the two coping measures; positive with active coping and negative with passive coping. Our results suggest that acceptance and active coping have much in common, especially if it is taken into account that active coping is defined as the patients' attempts to control their pain or to function in spite of their pain (40,61), the latter being a key component of the acceptance construct.

In this study, acceptance showed a strong negative relationship with catastrophizing self-statements. McCracken and Eccleston (25) speculated on the relationship between acceptance and catastrophizing. They emphasized that both catastrophizing and acceptance have in common the acknowledgment that pain will continue, but whereas in acceptance this acknowledgment is neutrally valued as a willingness to live with pain, in catastrophizing this recognition is characterized by a sense of helplessness. While still speculating on the relationship between both constructs, it is worth highlighting the attentional dimension of catastrophizing, rumination, which refers to the inability to divert attention away from pain (36). Catastrophic thinking directs the attention toward pain (33,58,62); in contrast, it is of great interest that acceptance has recently been found to be related to giving less attention to pain and, at the same time, to more engagement in daily activities (10). Besides this, several of the studies mentioned showed that individual differences in catastrophic rumination are accounted for by the participant's attempts to suppress or avoid pain-related thoughts and sensations (21,63). On the other hand, acceptance involves the active and aware incorporation of these private events occurring in one's life without unnecessary attempts to change their frequency or form.

This study has some limitations. Despite the fact that the measures included were intended to sample patient functioning across both emotional and behavioral domains, self-report was the only method included in the analyses. This leads to at least two problems. First, shared method variance may have contributed to the magnitude of some correlations. Second, this assessment method allows a number of factors to contribute to the patients' responses to the questionnaires. Future research should replicate this study including different assessment methods and also other widely used self-report measures, such as the Pain Catastrophizing Scale (64) or the Beck Depression Inventory (65).

Another limitation of this study has to do with the possible conceptual overlap between the coping and cognitive measures. The Vanderbilt Pain Management Inventory includes some items referring to cognitive coping strategies which could be particularly confused with the coping self-statements subscale of the PRSS. The coping self-statements subscale was possibly excluded from the final model due to such overlap with the coping scales. Future research should address this issue and, as suggested (56,66), measures that maintain a sharper demarcation between cognitive variables (beliefs, attitudes, appraisals) and overt behavioral coping efforts should be developed.

According to our results, approaching chronic pain in an accepting manner maintains functioning and, with this aim, acceptance-based treatments are promising as encouraging patients with chronic pain to give up the struggle to control pain and to pursue normal life activities (13). The maintenance of functioning is a very important goal of therapy because, as recent studies show (67,68), avoidance of activity is crucial in the developmental process that catalyzes acute pain into a chronic pain problem. However, the findings of this study also highlighted the role of control beliefs and of active coping to maintain a positive mood. From an ACT perspective, the interventions should emphasize active control over what can be changed, "allowing for challenging pain head on when that works, and willingness to have pain just exactly as it is when it does not" (26, p. 6). Nevertheless, it must be borne in mind that chronic pain is characterized by vicious circles (23) and therapists must be cautious because some patients could behave "effectively" but with a very negative mood that, in the long term, could hinder their daily functioning once again leading them toward disability. At the moment, there is some evidence supporting the efficacy of ACT to promote adjustment in patients with chronic pain (4,5); nevertheless its potential to generate long-lasting changes still remain to be proven.

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