

Cognitive appraisal and coping in chronic pain patients

Carmen Ramírez-Maestre*, Rosa Esteve, Alicia E. López

*Departamento de Personalidad, Evaluación y Tratamiento Psicológico, Faculty of Psychology,
Universidad de Málaga, Campus de Teatinos, 29071 Málaga, Spain*

Received 14 May 2007; received in revised form 18 October 2007; accepted 9 November 2007
Available online 21 December 2007

Abstract

Objectives: This study analyses the relationships between patients' cognitive appraisals concerning their pain and the coping strategies they use. In addition, the way the coping strategy influences the intensity of perceived pain and impairment in these patients was studied.

Methods: One hundred and twenty two patients with musculoskeletal chronic pain participated. The assessment tools were as follows: The Cognitive Appraisal Inventory for Chronic Pain Patients (CAI), the Vanderbilt Pain Management Inventory (VPMI), the McGill Pain Questionnaire (MPQ) and the Impairment and Functioning Inventory for Chronic Pain Patients (IFI). The hypothetical model was empirically tested using the LISREL 8.20 software package and the unweighted least squares method.

Results: High levels of challenge appraisal were associated with low levels of passive coping and high levels of active coping strategies, whereas the harm, loss or threat appraisal predicted high use of passive coping strategies. Passive coping had three statistically significant path coefficients: high levels of passive coping were associated with low levels of functioning and high levels of pain intensity and impairment. However, high levels of active coping reported high levels of daily functioning.

Discussion: By analysing the cognitive appraisals made by chronic pain patients, clinicians could make better predictions regarding the way they cope and adjust.

© 2007 European Federation of Chapters of the International Association for the Study of Pain. Published by Elsevier Ltd. All rights reserved.

Keywords: Chronic pain; Cognitive appraisal; Coping; Impairment

1. Introduction

Recent research shows that psychological factors predict adjustment to persistent pain. However, it has been highlighted the need to develop conceptual models that consider how these psychological factors are related (Keefe et al., 2004). In this sense, the cognitive-behavioural theory of pain identifies two categories of variables useful in predicting pain and disability: cognitions and coping responses (Jensen et al., 2001; Turner et al., 2000).

The *Transactional theory of stress* (Lazarus and Folkman, 1984) establishes that coping is a process that includes appraisals of a stressor, coping responses and reappraisals of the stressor. According to this theory, cognitive appraisal refers to the way in which individuals evaluate the relationships with their environment and the significance of these relationships to their well-being.

Based on the Transactional theory of stress, some studies concluded that cognitive appraisal of pain may have important implications on coping and the overall well-being of patients with chronic pain (Dysvik et al., 2005; Joksimovic et al., 2002; Jones et al., 2003; Keefe et al., 1997; Lamé et al., 2005; Ramírez-

* Corresponding author. Tel.: +34 952 132649; fax: +34 952 132405.
E-mail address: cramirez@uma.es (C. Ramírez-Maestre).

Maestre et al., 2000; Schmitz et al., 1996; Spinhoven et al., 2004; Unruh et al., 1999; Wilkie and Keefe, 1991). The threat appraisal refers to the potential for physical or psychological damage associated with pain in the future. Harm-loss appraisal is a cognitive assessment of actual physical or psychological damage or injury. Both cognitive appraisals can be considered as negative appraisals. On the other hand, challenge appraisal of pain refers to the potential for growth, mastery, or gain associated with pain (Unruh et al., 1999). From a cognitive-behavioural perspective, it has been hypothesized that negative appraisals about pain and its consequences, lead patients to use passive coping (defined as strategies giving control over pain to another person) more often regarding the problems of daily life which, in turn, leads to decreased daily activity levels, possibly resulting in functional incapacity. Otherwise, challenge appraisals lead patients to use active coping (defined as handling the pain or carry on functioning despite the pain) getting a good adjustment to chronic pain (Vlaeyen and Linton, 2000).

The main aim of the present research was to analyse the relationships between cognitive appraisal, the coping strategies and pain adjustment, and specifically, reported pain intensity, functional impairment and functional status. Taking into account the empirical literature concerning cognitive appraisal, it is postulated that patients' appraisals of harm, loss and threat will predict the use of ineffective passive coping strategies for managing chronic pain. On the other hand, appraising the situation as a challenge will predict the use of effective and active coping strategies. Regarding the effect of coping strategies, it is hypothesized that the use of passive coping strategies predicts a higher intensity of pain and a higher level of impairment. In this study, impairment was defined as decreased activity levels because of pain. Thus, the use of active coping strategies would predict less pain intensity pain and lower levels of impairment. In order to consider simultaneously the influence of all the predictor variables on all the dependent variables, multivariate multiple regression by Structural Equation Modelling was performed.

2. Methods

2.1. Participants

Participants were 122 patients with musculoskeletal chronic pain who attended the Clinical Pain Unit at the Carlos Haya 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.

There were more women than men in our sample (34.4% male, 65.6% female). As previous studies have shown (Masedo and Esteve, 2000), this distribution of sexes is typical of all patients who attend this clinic and other Spanish Pain Units (Calsals and Samper, 2004). The average age of the participants was 56 years old (range: 20–79; SD = 14.6). Although this sample may seem older than samples included in other studies, similar average ages may be found in prior studies (Esteve et al., 2005, 2007; Masedo and Esteve, 2000; Ramírez-Maestre and Valdivia, 2003; Ramírez-Maestre et al., 2004). Some 64.7% of the sample reported primary school education only. At the time of the study, 86.1% were retired or unemployed (54.3% of the participants had retired due to their pain problem and were at least receiving some disability allowance for their pain) and 80% were married.

The study participants indicated their pain sites as follows: 68% reported widespread pain; 15.6% reported back pain (pain in any area of the back); 9.8% cervical pain; and 6.6% lower limb pain. Mean pain duration was 9 years (109, 10 months; range: 1.16–40 years; SD = 100.9). Pain medication use was reported by 100% of the subjects (4 drugs on average) and 44% reported at least one surgical intervention to relieve pain.

2.2. Measures

2.2.1. Cognitive appraisal

The Cognitive Appraisal Inventory for chronic pain patients (CAI; Anarte et al., 1999; Ramírez-Maestre et al., 2005). This scale has 31 items divided into three subscales that were reliable under Cronbach's alpha (0.80, 0.82, and 0.85). The scales were designed to assess the type of appraisal that patients make about the situation of suffering chronic pain:

1. *Harm or loss appraisal*: This subscale assesses whether patients think that, because of their pain, they have lost something important in their lives or have experienced some kind of injury (e.g. *Do you think or feel that since you have chronic pain you go out less than before?*). Reliability under Cronbach's alpha was 0.79 for this study.
2. *Threat appraisal*: This is to assess whether patients think that they will lose something important in their lives or will experience some kind of injury in the future because of their pain (e.g. *Do you think or feel that if pain goes on you will have to stop doing things that you like?*). The internal consistency for the scores in this sample was 0.85.
3. *Challenge appraisal*: This subscale assesses patients' thoughts about potential for growth, mastery, or gain despite the pain (e.g. *Despite having chronic pain, will you be able to take care of your family?*). The internal consistency for this was 0.85.

Thus, the CAI (see Appendix) assesses the three types of cognitive appraisals of pain as Lazarus and Folkman proposed in their model (1984). Another important and original characteristic of this instrument is that it was made just for patients with chronic pain. The first study was made with a sample of 135 heterogeneous chronic pain patients (Anarte et al., 1999). The internal structure of the inventory was replicated in a second study with a sample of 224 chronic pain patients with the same characteristics as in the first one (Ramírez-Maestre et al., 2005).

2.2.2. Coping strategies

The Vanderbilt Pain Management Inventory (Brown and Nicassio, 1987), adapted into Spanish (Esteve et al., 2005) was used to assess coping strategies. The scale has 18 items divided into two subscales designed to assess how often chronic pain sufferers use active and passive strategies when their pain reaches moderate or high intensities:

- *Active strategies*: Handling the pain or carry on functioning despite the pain.
- *Passive strategies*: Strategies giving control over pain to another person or allowing pain to adversely affect other areas of the subject's life.

This adaptation demonstrates appropriate psychometric properties, with an internal consistency of $\alpha = .64$ for active strategies and $\alpha = .70$ for passive strategies.

2.2.3. Pain

One of the Spanish versions of the *McGill Pain Questionnaire* (Melzack, 1975) was used, specifically, the adaptation by Lázaro et al. (1994). This instrument consists of a list of 67 adjectives or descriptors classified into 19 subcategories. This scale yields an overall score of perceived pain which was used in this research. The internal consistency for the total score in this Spanish adaptation is $\alpha = .74$.

2.2.4. Impairment and daily functioning

Activity was assessed by the *Impairment and Functioning Inventory* for chronic pain patients (IFI; Ramírez-Maestre and Valdivia, 2003). This instrument is used to assess not only the daily activities of patients suffering chronic pain but also their impairment. Thus, this scale includes questions about the patients' current activities and their activities before suffering pain. This offers clinicians more precise knowledge concerning the impact that pain has on their patients' functioning. The inventory is composed of 19 items distributed in 4 scales:

1. *Household activity*: Activities aimed at taking care of the house (e.g. *During the last week... have you cooked a meal?*). The internal consistency for this scale was 0.90.

2. *Independent functioning*: Behaviours aimed at self-care and being independent (e.g. *During the last week... did you dress by yourself?*). The internal consistency for this scale was 0.60.
3. *Social activities*: Leisure behaviours that patients engage in with other people, friends, and family (e.g. *During the last week... have you visited any friend?*). Cronbach's alpha for this scale was 0.65.
4. *Leisure activities*: Activities which do not require the patients to have social contact with others (e.g. *During the last week... have you been for a walk?*). The internal consistency for this scale was 0.65.

Finally, this instrument has two general indicators used as variables in this study: level of daily functioning (internal consistency in this study: $\alpha = 0.80$) and level of impairment (internal consistency in this study: $\alpha = 0.75$), and showing good levels of validity (Ramírez-Maestre and Valdivia, 2003).

2.3. Procedure

The subjects were interviewed the first time they attended the Clinical Pain Unit at the Carlos Haya Hospital in Málaga (Spain). As 19% of the participants were illiterate, measures were applied via interview. Interviews were conducted in this centre and the patients were sent to us by the doctors after their first visit. 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. They were interviewed in the department ward by a psychologist who was a member of the research team with no other person present.

2.4. Analyses

Table 1 shows descriptive statistics of the main study variables.

In order to consider simultaneously the influence of all the exogenous variables on all the endogenous variables, the analysis was carried out under Structural Equations Modelling with LISREL 8.30 software (Jöreskog and Sorbom, 1999). The basic elements of the model are the *exogenous and endogenous variables*, and the *parameters*. Following the hypothetical model shown in Fig. 1, the *exogenous variables* in this case are the ones included in cognitive appraisal, whereas coping strategies (passive and active), pain, impairment, and functioning are *endogenous variables*. On the other hand, the *parameters* of this model are the coefficients or “loads” that the values of the variable will be multiplied by. The beta (β) and gamma (γ) coefficients can be interpreted as direct effects on the endogenous variables.

Table 1
Descriptive statistics

	Minimum	Maximum	Mean	Standard deviation
Appraisal of harm	0.00	9.00	5.3361	2.59564
Appraisal of threat	0.00	10.00	6.0574	2.85257
Appraisal of challenge	0.00	12.00	6.4672	3.39709
Passive coping	11.00	33.00	21.5328	4.72760
Active coping	8.00	26.00	14.6885	4.18198
Pain	14.00	49.00	33.6885	8.42476
Functional status	0.00	115.00	55.2213	28.98575
Functional impairment	0.00	18.00	3.5574	3.62053

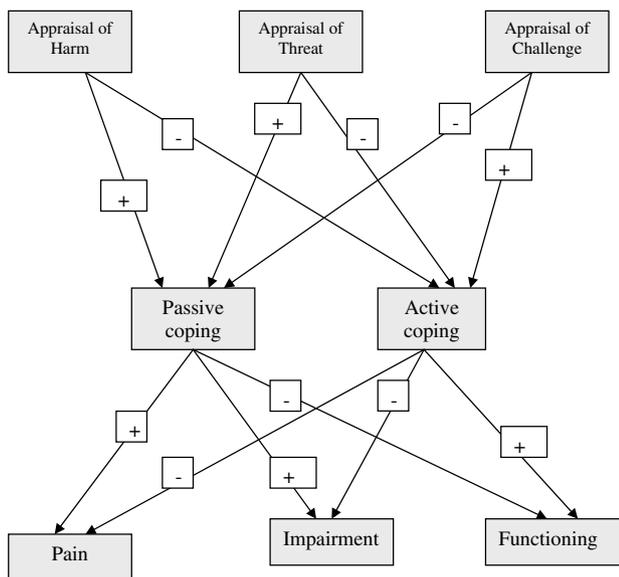


Fig. 1. Hypothetical model.

Beta indicates that a change unit in an endogenous variable modifies beta change units in another endogenous variable, while the rest of the variables remain constant. Gamma indicates that a change unit in an exogenous variable modifies gamma change units in an endogenous

variable. The hypotheses are depicted in Fig. 1, where the expected relationship between the variables under analysis is shown. Thus, it was hypothesized that the appraisal of harm and the appraisal of threat have a positive effect on the use of passive coping strategies and a negative one on the use of active coping strategies. However, the appraisal of challenge has a positive effect on active coping and a negative one on passive strategies. Regarding coping strategies and patients' adaptation, it is assumed that there is an inverse relationship between passive coping and the level of functioning. On the other hand, the use of passive coping strategies would have a positive effect on perceived intensity of pain and impairment. Finally, it was assumed that the use of active strategies for coping with pain has a positive effect on daily functioning and a negative one on intensity of pain and impairment. The estimation method was Unweighted Least Squares because the assumption of multivariate normality was not fulfilled, and several goodness-of-fit indexes were used to test the suitability of the model:

- Goodness-of-fit index (GFI) – referring to how much of the correlation matrix is observed and explained by the model.
- The GFI adjusted to the degrees of freedom of the model (AGFI) (the difference between the number of equations and unknown factors).
- The comparative fit index (CFI), which compares the fit between the proposed model and other possible models, whether specific or randomly generated by the system/software package.

All these indexes fluctuate between 0 and 1, 1 being a perfect fit.

- Root mean square error of approximation (RMSEA).
- Root mean square residual and standardized Root mean square residual (RMR).

Analyses were performed on the correlation matrix (Table 2). As shown in this table, there is a correlation

Table 2
Correlation matrix

Variable	Appraisal of harm	Appraisal of threat	Appraisal of challenge	Passive coping	Active coping	Pain	Functional status	Functional impairment
Appraisal of harm	1							
Appraisal of threat	0.672**	1						
Appraisal of challenge	-0.606**	-0.717**	1					
Passive coping	0.524**	0.468**	-0.472**	1				
Active coping	-0.292**	-0.331**	0.553**	-0.262**	1			
Pain	0.572**	0.489**	-0.373**	0.389**	-0.034	1		
Functional status	-0.327**	-0.305**	0.386**	-0.201*	0.278**	-0.010	1	
Functional impairment	0.510**	0.464**	-0.567**	0.294**	-0.201*	0.281**	-.515**	1

Note: *P < .05; **P < .01.

between most of the variables, except between active coping and pain and between pain and functional status.

3. Results

Table 3 shows the standardized coefficients of the model. As can be seen, appraisal of harm mainly influenced passive coping and appraisal of challenge influenced active coping. Passive coping influenced pain intensity, functional status and functional impairment. On the other hand, the influence of active coping is quite low.

All paths of the initial model that were not statistically significant were deleted to obtain a parsimonious model. For this reason, three initial paths were eliminated: from appraisal of harm to active coping and from active coping to functional impairment and to pain intensity. Fig. 2 represents the final model.

The various goodness-of-fit indexes calculated indicated that the estimated model provides a good fit to the data: The three indexes are highly satisfactory (GFI = 0.97; AGFI = 0.93; CFI = 0.97). For the final model RMSEA = 0.0 and P-value for test of close fit (RMSEA < .05) = .80; RMR = .098, and Standardized RMR = .16

3.1. Cognitive appraisal

As can be seen (Fig. 2), the only statistically significant path coefficients for appraisal of harm was to passive coping; individuals with higher levels of appraisal of harm report higher levels of passive coping. On the other side, appraisal of threat yielded two statistically significant path coefficients. The first was to passive coping and the second to active coping, with individuals characterized by higher levels of appraisal of harm reporting higher levels of passive coping and lower levels of active coping. Moreover, appraisal of challenge had two statistically significant path coefficients: higher levels of appraisal of challenge were associated with lower levels of passive coping and higher levels of active coping.

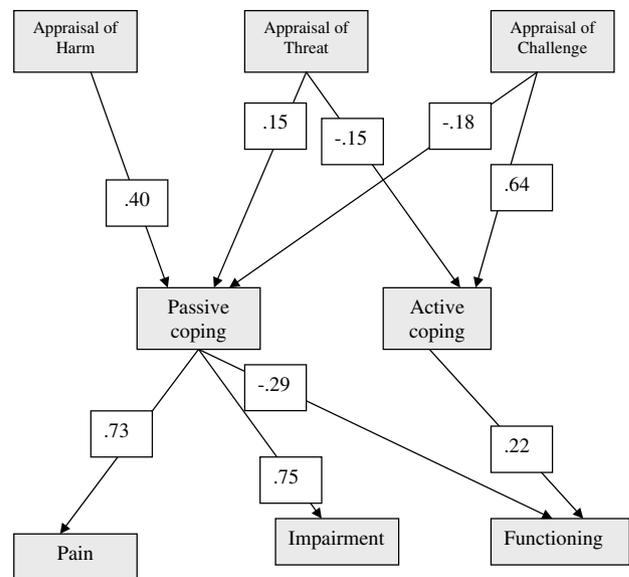


Fig. 2. Final model. Grey rectangles are observed (measured) variables; values in white rectangles are the changed parameters.

3.2. Coping strategies

Passive coping had three statistically significant path coefficients: higher levels of passive coping were associated with lower levels of functioning and higher levels of pain intensity and impairment. However, the only statistically significant path coefficient for active coping was to functioning; individuals with higher levels of active coping reported higher levels of daily functioning.

4. Discussion

The main purpose of this study was to analyse the relationship between cognitive appraisals, coping strategies and the consequences that suffering chronic pain has on patients' lives. In this line, although numerous works have studied the role of coping strategies, cognitive appraisal is a relevant theoretical variable that has not received very much empirical attention. Cognitive appraisal refers to the ongoing way in which individuals define and evaluate relationships with their environment

Table 3
Initial model: standardized coefficients

Exogenous variables	Endogenous variables				
	Passive coping	Active coping	Functional status	Functional impairment	Pain intensity
Appraisal of harm	0.38	0.028			
Appraisal of threat	0.15	0.17			
Appraisal of challenge	-0.19	0.66			
Endogenous variables					
Passive coping			-0.39	0.78	0.89
Active coping			0.20	-0.049	-0.022

as well as the significance of these relationships to their well-being. Thus, appraising pain as a threat refers to the potential for harm or loss, where the appraisal of harm or loss is a cognitive assessment of actual physical or psychological damage or injury. On the other hand, the appraisal of pain as challenge refers to the potential for growth, mastery, or gain associated with the pain event (Dysvik et al., 2005; Lazarus and Folkman, 1984; Unruh et al., 1999). There are several studies allowing us to suggest that when a patient appraises his/her pain as a threat, harm or loss he/she will use passive coping strategies of little efficacy, whereas a challenge appraisal predicts greater use of active and effective strategies for handling pain (Hampson et al., 1996; Jensen et al., 2001; Jones et al., 2003; Lamé et al., 2005; Unruh et al., 1999). Thus, cognitive appraisals of pain could indirectly predict the level of functioning, impairment, and pain intensity of pain. Some results in this line show that harm, loss and threat appraisal are significantly associated with passive coping and the greater use of passive strategies also lead to an indirect relationship between these cognitive appraisals and pain intensity. It should be noted that several previous studies show that personal characteristics (sex, age and personality) act as differential variables which determine how pain is experienced (Ramírez-Maestre et al., 2004). These antecedent variables may be associated with cognitive appraisal in the same way as they are with coping strategies. According to several studies, daily activity and impairment are considered as indicators of chronic pain patients' health, adjustment, quality of life, and well-being (Crook et al., 1986; Ferrer et al., 1993; Follick et al., 1984; Karoly and Jensen, 1987; Naliboff et al., 1985; Romano and Turner, 1985; Turk and Rudy, 1986, 1987). Thus, the results of the present study showed that cognitive appraisals of pain, due to the mediating role of passive coping, influence the level of functioning and impairment. It is important to note that most of the instruments used to assess patient functioning ask them about activities they do at engage in. However, it is possible that a current low level of functioning is not a consequence of suffering pain because the activities could have been the same before pain onset. For example, if a male patient is asked about household activities, he could say that he does not do anything, but it is possible that he never did, even when not suffering pain. Thus, using impairment instead of present functioning may be a better indicator of health, quality of life, and well-being.

As found in other studies carried out by the authors (Esteve et al., 2005; Ramírez-Maestre et al., 2004), although active strategies did not seem to be associated with the level of perceived pain and impairment, there was a negative relationship between both active and passive strategies. This means that as active coping strategies increase, passive ones decrease. If this is so, we

could expect that training in the use of active strategies would indirectly reduce the use of inefficient passive strategies that lead to a stronger intensity of perceived pain and a higher level of impairment. In any case, both active and passive coping responses are not mutually exclusive. Both coping strategies may be used at different times by the same individuals, depending on the particular situation. As has been argued by Turner et al. (2000), successful coping may depend on a wide variety of factors, so it is unlikely that any one coping strategy will prove to be consistently successful or unsuccessful. However, there is fairly consistent evidence indicating that passive coping, negative thinking and pain avoidance are associated with poorer adaptation, whereas active coping, pain control and rational thinking are associated with better adaptation, although these coping responses show much weaker predictive capacity (Boothby et al., 1999; Esteve et al., 2005; Snow-Turek et al., 1996).

Summing up, the study hypothesis are partially supported. The coping strategies used by chronic pain sufferers are highly important to their well-being. However, in the light of this and other results (Ramírez-Maestre et al., 2000, 2004; Esteve et al., 2005; Rodríguez et al., 2000; Snow-Turek et al., 1996), although the role of passive strategies is clear regarding their effect on pain and consequent patient adaptation, the role of active coping is not clear at all, except for its negative relationship with passive strategies. As Lazarus and Folkman (1984) indicate, the way the subjects appraise the situation will determine the coping strategies they use and their adjustment. As Turner and colleagues point out (Turner et al., 2000), it is very important to target specific pain-related beliefs and coping strategies for modification in the treatment of chronic pain patients. Therefore, it is essential to continue this line of research to find out which cognitive appraisals and coping strategies are most related to patients' adjustment. Thus, if challenge appraisals are important in the overall health and well-being of people who suffer chronic pain, then determining how threat and harm-loss appraisals can be lowered, and challenge appraisals fostered and supported, will be critical in the overall management of chronic pain. This will also help the clinicians to obtain better results when treating chronic pain patients.

Finally, we wish to emphasize that a limitation of this study is the exclusive reliance on self-report measures. In addition, the research relied on cross-sectional measures of cognitive appraisal and pain coping, therefore the results cannot capture the dynamic process of pain coping as has been pointed out recently by Keefe et al. (2004). Again, because of the cross-sectional study design, the identification of causal relationships is not possible. Longitudinal research designed to follow cognitive and coping variables over time would help to

develop causal models showing the influence of those variables on pain adjustment. Due to the reciprocal nature of the associations among cognitive appraisals, coping, and pain adjustment (i.e. psychological and physical functioning), daily diary methods would be useful to better capture the process of coping with pain at different times.

Acknowledgement

This research was supported by grants from the University of Málaga, Dirección General de Enseñanza Superior (BSO2002-02939) and Junta de Andalucía (HUM-566).

Appendix. Cognitive Appraisal Inventory (CAI) for chronic pain patients

Instructions: The following are statements about what people might think/feel when they have pain. You should answer YES or NO depending on whether the question is representative of your personal situation. There are no correct or incorrect answers. The purpose is to know the way you **usually** think/feel.

1. Yes	2. No
You think/feel that because you have chronic pain,	
1. your sexual relationships are worse than before	1 2
2. you have lost interest in doing things that you used to do before	1 2
3. you sleep worse than before	1 2
4. your work/daily activities are not the same as before	1 2
5. you go out less than before	1 2
6. you need more help than before	1 2
7. you have lost your self-confidence	1 2
8. you visit your friends less than before	1 2
9. you spend your life going to see doctors, hospital, etc.	1 2
You think or feel if pain goes on:	
10. you will lose touch with your friends	1 2
11. your temper will be worse	1 2
12. you will sleep badly	1 2
13. you will have to stop working or doing daily activities	1 2
14. you will have to stop doing things that you like	1 2
15. you will spend your life going to see doctor, hospitals, etc.	1 2
16. your sexual relationships will be worse	1 2
17. you will not be able to visit your friends	1 2

18. you will lose your appetite	1 2
19. you will not feel like going out	1 2

Despite having chronic pain, will you be able to . . .

20. be self-sufficient	1 2
21. remain optimist	1 2
22. eat well	1 2
23. keep on productivity at work	1 2
24. keep up relationships with friends	1 2
25. go out and enjoy yourself	1 2
26. continue visiting your friends	1 2
27. keep up sexual relationships	1 2
28. take care of your family	1 2
29. go on doing things you like	1 2

You think that, despite pain. . .

30. you won't have to go to hospital all the time	1 2
31. you will live as best as you can	1 2

Measuring:

- **Harm/loss:** items 1–9
- **Threat:** items 10–19
- **Challenge:** items 20–31

References

- Anarte MT, Ramírez-Maestre C, López AE, Esteve R. Evaluación de estrategias de afrontamiento, nivel de funcionamiento y edad en personas con dolor crónico oncológico y benigno. Benalmádena: IV Congreso de la Sociedad Española del Dolor; 1999.
- Boothby JL, Thorn BE, Stroud MW, Jensen MP. Coping with pain. In: Gatchel RJ, Turk DC, editors. Psychosocial factors in pain. New York: Guildford Press; 1999.
- Brown GK, Nicassio PM. Development of a questionnaire for the assessment of active and passive coping strategies in chronic pain patients. *Pain* 1987;31:53–64.
- Calsals M, Samper D. Epidemiología, prevalencia y calidad de vida del dolor crónico no oncológico. *Revista Sociedad Española del Dolor* 2004;11:260–9.
- Crook J, Tunks E, Rideout E, Browne G. Epidemiologic comparison of persistent pain sufferers in a sociality pain clinic and in the community. *Arch Phys Med Rehabil* 1986;67:451–5.
- Dysvik E, Natvig GK, Eikeland OJ, Lindstrøm TC. Coping with chronic pain. *Int J Nurs Stud* 2005;42:297–305.
- Esteve MR, Ramírez-Maestre C, López AE. General versus specific indices in the assessment of chronic pain coping. *Psychol Spain* 2005;16:421–8.
- Esteve MR, Ramírez-Maestre C, López AE. Adjustment to chronic pain: the role of pain acceptance, coping strategies and pain-related cognitions. *Annals Behav Med* 2007;33:179–88.
- Ferrer VA, González Barrón R, Manassero MA. El West Haven-Yale Multidimensional Pain Inventory: Un instrumento para evaluar al paciente con dolor crónico. *Dolor* 1993;8:153–60.
- Follick MJ, Zitter RE, Ahern DK. Failures in the operant treatment of chronic pain. In: Foa EB, Emmelkamp P, editors. Failures in behavior therapy. New York: Wiley; 1984.
- Hampson SE, Glasgow RE, Zeiss AM. Coping with osteoarthritis by older adults. *Arthrit Care Res* 1996;9:133–41.
- Jensen MP, Turner JA, Romano JM. Changes in beliefs, catastrophizing, and coping are associated with improvement in multidisciplinary pain treatment. *J Consult Clin Psychol* 2001;69:455–62.

- Joksimovic L, Starke D, Knesebeck O, Siegrist J. Perceived work stress, overcommitment, and self-reported musculoskeletal pain: a cross-sectional investigation. *Int J Behav Med* 2002;9:122–38.
- Jones DA, Rollman GB, White KP, Hill ML, Brooke RE. The relationship between cognitive appraisal, affect, and catastrophizing in patients with chronic pain. *J Pain* 2003;4:267–77.
- Jöreskog KJ, Sorbom D. LISREL 8.2. Analysis of linear structural relationships by maximum likelihood instrumental variables and least squares methods. Mooresville: Scientific Software International; 1999.
- Karoly C, Jensen MP. Multimethod assessment of chronic pain. New York: Pergamon Press; 1987.
- Keefe F, Affleck G, Lefebvre JC, Starr K, Caldwell DS, Tenneh H. Pain coping strategies and coping efficacy in rheumatoid arthritis: a daily process analysis. *Pain* 1997;69:35–42.
- Keefe FJ, Rumble ME, Scipio CD, Giordano LA, Perri LM. Psychological aspects of persistent pain: current state of the science. *J Pain* 2004;4:195–211.
- Lamé IE, Peters ML, Vlaeyen JW, Kleef MV, Patijn J. Quality of life in chronic pain is more associated with beliefs about pain, than with pain intensity. *Eur J Pain* 2005;9:15–24.
- Lázaro C, Bosch F, Torrubia R, Baños JE. The development of a Spanish questionnaire for assessing pain: preliminary data concerning reliability and validity. *Eur J Psychol Assess* 1994;10:145–51.
- Lazarus RS, Folkman S. Stress, appraisal and coping. Nueva York: Springer; 1984.
- Masedo AI, Esteve R. Some empirical findings regarding the validity of the Spanish Version of the McGill Pain Questionnaire (MSQ-SV). *Pain* 2000;85:451–6.
- Melzack R. The McGill Pain Questionnaire: major properties and scoring methods. *Pain* 1975;1:277–99.
- Naliboff BD, Cohen MJ, Swanson GA, Bonebakker AD, McArthur DL. Comprehensive assessment of chronic low back pain patients and controls: physical abilities, level of activity, psychological adjustment and pain perception. *Pain* 1985;23:121–34.
- Ramírez-Maestre C, Esteve R, López AE. Development of an inventory to assess cognitive appraisal in patients with chronic pain. In: Budapest: 8th European conference on psychological assessment; 2005.
- Ramírez-Maestre C, López AE, Esteve R. Personality characteristics as differential variables of the pain experience. *J Behav Med* 2004;27:147–65.
- Ramírez-Maestre C, Valdivia Y. Evaluación del funcionamiento diario en pacientes con dolor crónico. *Psicol Conduct* 2003;11:283–91.
- Ramírez-Maestre C, Valdivia Y, Anarte MT, Masedo A. Diferencias individuales en las evaluaciones cognitivas de pacientes con dolor crónico. Barcelona: V Jornada de la Sociedad Española para la Investigación de las Diferencias Individuales; 2000.
- Rodríguez MJ, Esteve R, López A. Represión emocional y estrategias de afrontamiento en dolor crónico oncológico. *Psicothema* 2000;12:339–45.
- Romano JM, Turner JA. Chronic pain and depression: Does the evidence support a relationship? *Psychol Bull* 1985;97:18–34.
- Schmitz U, Saile H, Nilges P. Coping with chronic pain: flexible goal adjustment as an interactive buffer against pain-related distress. *Pain* 1996;67:41–55.
- Snow-Turek AL, Norris MP, Tan G. Active and passive coping strategies in chronic pain patients. *Pain* 1996;64:455–62.
- Spinhoven P, ter Kuile MM, Kole-Snijder AMJ, Mansfeld MH, den Ouden DJ, Vlaeyen JWS. Catastrophizing and internal pain control as mediators of outcome in the multidisciplinary treatment of chronic low back pain. *Eur J Pain* 2004;8:211–9.
- Turk DC, Rudy T. Assessment of cognitive factors in chronic pain: a worthwhile enterprise? *J Consult Clin Psychol* 1986;6:760–8.
- Turk DC, Rudy T. Towards a comprehensive assessment of chronic pain patients. *Behav Res Ther* 1987;4:237–49.
- Turner JA, Jensen MP, Romano JM. Do beliefs, coping and catastrophizing, independently predict functioning in patients with chronic pain? *Pain* 2000;85:115–25.
- Unruh AM, Ritchie J, Merskey H. Does gender affect appraisal of pain and pain coping strategies? *Clin J Pain* 1999;15:31–40.
- Vlaeyen JWS, Linton SV. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. *Pain* 2000;85:317–32.
- Wilkie DJ, Keefe JF. Coping strategies of patients with lung cancer-related pain. *Clin J Pain* 1991;7:292–9.