

Assessment of chronic pain coping strategies

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Evaluación de las estrategias de afrontamiento del dolor crónico

Summary

Introduction. We made an adaptation of the Coping Strategies Questionnaire (CSQ) to the Spanish population. This measure, the most used in its scope, was developed by Rosenstiel and Keeffe in 1983.

Method. 205 participants coming from Primary Health Care and pain clinics made up the sample. More than half suffered migraine and chronic tension-type headache; the rest, fibromyalgia, low back pain, arthrosis or arthritis.

Results. Factor analyses explained 59% of the total variance, on an 8-factor structure that converged into a 2-factor structure. In the 8-factor solution the novelty was the diversification of mental-non-mental distraction strategies, and religious-non-religious hope strategies. In the 2-factor solution the novelty was the grouping according to the efficacy of the coping. All the CSQ factors showed inner consistency and construct validity. Thus, unadaptive coping strategies were related to negative, anxious and depressed self-talk, related to lack of control and perceived self-efficacy, and related to many pain behaviors. On the contrary it happened with adaptive coping strategies. In addition, the diagnosis of pain was related to the utilization and effectiveness of coping strategies.

Conclusions. CSQ is shown to be a reliable and valid measure of coping strategies in chronic pain in the Spanish population, showing the difference between theoretical and empirical factor structures again.

Key words: Chronic pain. Coping Strategies Questionnaire. Psychological assessment. Coping.

Resumen

Introducción. Se realizó una adaptación a la población española del Cuestionario de Estrategias de Afrontamiento del Dolor (CSQ). El instrumento, el más utilizado en su ámbito, fue desarrollado por Rosentiel y Keeffe en 1983.

Método. Compusieron la muestra 205 pacientes procedentes de centros públicos de Atención Primaria y unidades de dolor. Más de la mitad padecía migraña y cefalea tensional crónica; el resto fundamentalmente fibromialgia, lumbalgia, artrosis y artritis.

Resultados. Los diversos análisis factoriales explicaron el 59% de la varianza total sobre una estructura de ocho factores de primer orden que convergieron en dos de segundo orden. En los de primer orden la novedad fue la diversificación de la distracción mental y no mental y de la esperanza con y sin matices religiosos. En los de segundo orden lo novedoso fue la agrupación según la eficacia del afrontamiento. Todos los factores obtenidos mostraron su consistencia interna y validez de constructo. Así, las estrategias de afrontamiento desadaptativas se asociaron a un lenguaje interno negativo, ansiógeno y depresógeno, a una deficiente percepción de control y autoeficacia percibida y a la proliferación de conductas de dolor de diversa naturaleza. Al contrario ocurrió con las estrategias de afrontamiento en función del diagnóstico.

Conclusiones. El CSQ se muestra como un instrumento válido y fiable para evaluar las estrategias de afrontamiento del dolor crónico en población española, volviéndose a demostrar la discrepancia entre su estructura teórica y la obtenida empíricamente.

Palabras clave: Dolor crónico. Cuestionario de Estrategias de Afrontamiento del Dolor. Evaluación psicológica. Afrontamiento.

INTRODUCTION

It is not strange or difficult to justify the importance of coping strategies in chronic pain disorders, considering the large amount of data available in recent decades

and especially since the proposal of Lazarus^{1,2} who established a complex model that was very different from that of stress as a stimulus or as a simple response.

Assessments of pain and coping are indissolubly united processes that greatly determine the evolution of symptoms and even the chronification of the picture³. In this sense, the investigators have oriented their efforts to determine pain coping modes that appear, with what type of assessments they are related and the results they have on the course of the disorder.

In regards to the first aspect, an attempt has been made to determine the structure of the coping strategies used in the control of pain, focusing more on specific strate-

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gies than on styles. The results point to a structure that is already known in other research areas, stressing the cognitive type ones (for example, using imagination to ignore pain or transforming it into another sensation, distraction or cognitive restructuring), and behavioral type ones (seeking social support, rest, avoiding activities or situations, medication, exercise), etc.

In regards to the pain assessment processes, the variables most related with coping are those referring to self-talk, especially control beliefs. Thus, irrational beliefs on pain^{4,5,6}, negative automatic thoughts^{7,8}, the place of control^{9,10} and perceived¹¹⁻¹³ self-efficacy have been investigated.

The results of coping have been related with changes in the sensorial (intensity, frequency, duration) as well as emotional (anxiety, depression) and functional (pain behaviors, incapacity, interference in social, work life, etc.) pain parameters. For example, Gil et al.¹⁴ found that coping strategies predict adjustment to the disease. Passive coping (catastrophization, rest, etc.) are unadaptive, being associated with the increase of pain intensity and frequency, to greater stress levels and more frequent hospitalizations and visits to the doctor. Active coping (ignoring pain sensations, self-verbalization of coping, diverting attention, etc.) has stood out as more adaptive, showing a decrease in the sensorial parameters of pain. Jensen et al.¹⁵ found that hopelessness and catastrophization are directly associated with high levels of emotional incapacity and depression, while praying and having hope were associated with high physical incapacity. Geisser et al.¹⁶ showed that catastrophization influences the relationship between the evaluative and affective aspects of pain and depression. Haythornwaite et al.¹⁰ supplied data that support the dynamic relationship between appraisal and coping in chronic pain: two coping strategies, self-verbalization of mood for coping and reinterpreting the pain, predicting the perception of control on pain.

Considering, therefore, the relevance of coping in the experience of chronic pain, the need soon arose to have simple, valid and reliable instruments to assess it. Rosenstiel and Keefe¹⁷ developed the Coping Strategies Questionnaire (CSQ) to assess the coping strategies used for a sample of patients with chronic low back pain. The authors established a theoretical structure that included six cognitive strategies (Diverting attention, Reinterpreting pain sensations, Coping self-statements, Ignoring pain sensations, Praying or hoping and Catastrophizing); two behavior strategies (increasing activity level and increasing pain behaviors); and two effectiveness scales (Control over pain and Ability to decrease pain). Based on this theoretical structure, they factorized the scores of the subscales (not the individual items). The resulting structure, of second order, was made up of three factors. The first, called Cognitive coping and suppression, includes Pain reinterpretation strategies, self-verbalization of coping and Ignoring pain, that imply active and generally adaptive coping. The second, hopelessness, includes the strategies of Catastrophization and Limited increase in the activity level, and is associated with passive coping and

little effectiveness. The third, Diverting attention and praying, refers to coping based on external aspects. The authors demonstrated that the use of certain coping strategies was generically associated with adjustment to the disorder. Thus, the patients who used the first strategy group were shown to be less functionally disabled persons; those who used strategies of the second group appeared more anxious and depressed while those who used the third group suffered more pain and more functional limitation.

Since it was elaborated up to the present moment, the CSQ has been the coping strategies questionnaire used most (in at least 80 investigations) and is the most valid of those existing (at least in 20 investigations). In addition to samples of heterogeneous chronic pain¹⁸⁻²⁴, it has been adapted in hemophiliacs^{9,25,26}, in pain of phantom limb^{27,28}, in fibromyalgia²⁹, in chronic low back pain³⁰⁻³², in sickle cell disease³³, and in rheumatoid arthritis³⁴. Interestingly, we have not found any specific adaptation in headaches, the most frequently existing chronic pain.

Most of these studies have focused on, as in the original study, the validation of the second order structure, two or three factors being found. Those that find two factors are difficult to compare. For example, Neves²⁷: Cognitive-behavior strategies and hopelessness; Riley et al.³⁰: Cognitive coping and distraction; Gil et al.¹⁴: Coping attempts and negative thought-passive adherence. In those having three factors, there seems to be more homogeneity, above all in regards to two of them: Cognitive coping and Hopelessness^{9,28,29}.

However, few studies have attempted to verify the first order factorial structure based on individual items, in spite of there being data that document the discrepancy between the factorial structures obtained empirically and those formulated theoretically²³ and of the predictive superiority of the simple scores in the disorder status^{15,31}. In those which have done so, structures of four^{23,26} and five factors²¹ appear. However, the only available data based on confirmatory factorial analysis stress the structure of six factors³⁰. In addition, we only know of one study in regards to the Spanish speaking population, that of Soriano and Monsalve³⁵ performed on 58 patients having chronic pain in a Spanish pain unit and in which the first order factors were not obtained empirically, but rather were based on the initial theoretical formulation of Rosenstiel and Keefe¹⁷.

According to the previous considerations, we feel that it is necessary to perform an adaptation of the CSQ that will contribute information on the assessment of the coping strategies used by the chronic pain patients in a Spanish cultural context. In addition, and specifically, we are interested in comparing the use of compound and individual measures, granting special relevance to chronic headache cases.

METHOD

Subjects

The total sample is made up of 205 cases of chronic pain recruited in three public centers of the city of Sevi-

lle (Spain). Two of them are Primary Health Care, the third is a Pain Unit from one of the city's hospitals. In the Primary Health Care centers, the patients were recruited from among those who consulted due to headaches as a main picture. In the Pain Unit, the enrolment occurred in the evaluation or treatment sessions. A total of 33% of the diagnoses included in the sample was migraine (basically migraine without aura); 24% were chronic tension headache, 24% muscular pain (basically fibromyalgia and low back pain); and 19% had a bone origin pain (basically arthrosis and arthritis). The migraine and tension headache diagnoses were performed by the Primary Health Care physicians using the International of Headache Society criteria³⁶. The remaining diagnoses were performed by the medical specialists of the Pain Unit. Some of the patients seen in the Pain Unit had received several acupuncture treatment sessions, a variable that was recorded and controlled in the investigation.

A total of 86% of the sample were women; mean age was 41 (± 10) years, and the mean income per capita 3,982 (± 4911) euros. A total of 83% were married, 11% single and 6% in a situation other than the previous. A total of 21% of the subjects had no educational level, 46% had studied primary education, 22% secondary education or vocational training and 11% had university studies. A total of 47% were housewives, 29% worked, 14% had temporary or permanent incapacity, 5% were studying and 5% were unemployed.

The mean duration of the disorder was 12.5 (± 10.3) years; the mean duration of the pain episodes was 24 (± 16) hours; mean pain intensity was 6.7 (± 1.9) for a maximum of 10 in an analogue visual scale; mean frequency was 18.6 (± 12.2) episodes per month; average daily analgesics were 1.9 (± 2.1); daily anxiolytics were 0.42 (± 0.9), and daily antidepressants were 0.12 (± 0.6).

Material

Coping Strategies Questionnaire (CSQ)

Rosenstiel and Keefe¹⁷ generated the 48 items of the CSQ from their experience in clinical and experimental studies. They were divided into eight scales of six items each: *a*) diverting attention; *b*) reinterpreting pain sensation; *c*) coping self-statements; *d*) ignoring pain sensation; *e*) praying and hoping; *f*) catastrophizing; *g*) increasing activity level, and *h*) increasing pain behaviors. For the question «How frequently do you use the following strategies when you have pain?», the subjects answered according to the 7 point Likert scale: 0: never; 3: sometimes; 6: always. At the end of the questionnaire, there are two perceived effectiveness items: *i*) control over pain (0-6), and *j*) ability to decrease the pain (0-6).

When the adaptation was performed, we ignored the existence of the Soriano and Monsalve version³⁵, so that we adapted the CSQ items, without substantially modifying the content of any of them, although we eliminated the two referring to the grade of pain control and the abi-

lity perceived to reduce it, since we have specific instruments to assess these parameters. In regards to the score system, we respected the 7 point Likert scale. Although the studies on this instrument only explicitly mentioned the extremes and mean point (0: never; 3: sometimes; 6: always), we included the intermediate scores: 1: almost never; 2: few times; 4: many times; 5: almost always.

Other measures

Together with the CSQ, we used other instruments that allowed us to perform an exhaustive evaluation of different aspects involved in chronic pain. The first one was a clinical history, elaborated ad hoc to evaluate the sensorial parameters of pain. The rest were instruments adapted by us to assess different psychological conditions such as negative thoughts, with the Inventory of Negative Thoughts in Response to Pain (INTRP)^{7,37}; pain behaviors with the Pain Behavior Questionnaire (PBQ)^{38,39}, anxiety, with the Anxious Self-Statement Questionnaire (ASSQ)^{40,41}, sadness, with the Automatic Thought Questionnaire^{41,42}; control site, with the Headache Specific Locus of Control Scale (HSLC)^{43,44}; and perceived self-efficacy, with the Headache Self-Efficacy Scale (HSES)^{44,45}. The latter two were adapted to permit assessment not only of headaches, but also of any type of chronic pain.

Procedure

The series of instruments, including the CSQ, was applied by psychologists in specific sessions of programmed evaluation as part of the medical care to the patients. The data were processed with the SPSS 10 program, where several statistical analyses were performed.

To verify the validity of the CSQ, we used two procedure types: Factor Analysis in the case of structural validity; and association with different variables, in the case of construct validity. Reliability was verified using Cronbach's α coefficient. To determine the use of coping strategies in the different groups diagnosed, we used the univariate F test, of comparison of means, with the Tukey post hoc test.

Two factor analyses were performed: one, first order, on the answers to the individual items; the other, second order, on the first order factors or coping strategies. In both, the extraction of factors was performed with the Main Components procedure (self-values above 1), in which the variables are exact linear combinations of the factors. After the extraction, a Varimax rotation was performed (commonalities estimated by iteration, 25 as a maximum), ruling out the factorial loads inferior to 0.30. This type of rotation is orthogonal and its objective is to simplify the interpretation of the factors.

The measures chosen corresponded to all the levels of the pain experience. The clinical and sensorial parameters were intensity, frequency and duration of pain as well as the consumption of medication for pain and the

number of treatment sessions received. The emotional parameters were anxiety and sadness. The cognitive parameters were automatic negative thoughts, site of control and perceived of self-efficacy. The behavioral parameters were pain behaviors.

RESULTS

Factorial structure and internal consistency of the Coping Strategies Questionnaire

The first order factorial analysis revealed the existence of 11 underlying factors to the answers of the CSQ

items, that explained 64% of the variance (tables 1 and 2). Respectively, they did so in 22.4, 10.7, 5.7, 4.9, 4.2, 3.4, 2.8, 2.6, 2.6, 2.4 and 2.4%. In spite of the fact that all the items had enough load in some factor, three factors presented interpretation problems: the first was composed of items 16, 30, 15, 41 and 35; the second of items 44 and 36; and the last of items 21 and 46. After eliminating these nine items, the variance percentage explained was 59.2%.

The first factor obtained suggests negative and even dramatic ideation on pain, its consequences and the difficulties to face it. We call it Catastrophization and it is composed of items 2, 18, 37, 12, 38 and 26. The second

TABLE 1. First order factorial structure of the Coping Strategy Questionnaire

	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>
Factor I: Catastrophizing					
02. I feel I can't stand in anymore	0.83				
18. I feel like I can't go on	0.82				
37. It's awful and I feel that it overwhelms me	0.80				
12. It's terrible and I feel it's never going to get any better	0.77				
38. I worry all the time about whether it will end	0.73				
26. I feel my life isn't worth living	0.67				
Factor II: Distractor behaviors					
06. I do something I enjoy, such as watching TV or listening to music		0.71			
09. I leave the house and do something, such as going to the movies or shopping		0.66			
04. I count numbers in my head or run a song through my mind		0.65			
08. I play mental games with myself to keep my mind off the pain		0.65			
11. I walk a lot		0.63			
42. I try to be around other people		0.44			
Factor III: Self-instructions					
31. I tell myself to be brave and to carry on despite the pain			0.71		
03. I tell myself I can't let the pain stand in the way of what I have to do			0.70		
01. I see it as a challenge and don't let it bother me			0.65		
10. I tell myself that I can overcome the pain			0.60		
28. No matter how bad it gets, I know I can handle it	(-0.50)		0.39		
Factor IV: Ignoring the pain					
27. Although it hurt, I just keep on going				0.77	
32. I just go on as if nothing happened				0.76	
47. I lie down				-0.59	
23. I do something active, like household chores or projects				0.56	
07. I don't think about the pain				0.41	
05. I don't pay any attention to it				0.39	
33. I ignore it				0.39	
Factor V: Reinterpreting the pain					
17. I imagine that the pain is outside of my body					0.82
39. I try not to think of it as my body, but rather as something separate from me					0.70
20. I pretend it's not a part of me					0.63
34. I try to feel distant from the pain, almost as if the pain was in somebody else's body					0.48
19. I pretend it's not there					0.45
25. I tell myself it doesn't hurt					0.43

TABLE 2. First order factorial structure of the Coping Strategy Questionnaire (continuation)

	VI	—	VII	VIII	—	—
Factor VI: Hoping						
13. I have faith in doctors that someday there will be a cure for my pain	0.82					
14. I know someday someone will be here to help me and it will go away for awhile	0.80					
29. I try to think years ahead, what everything will be like after I've gotten rid of the pain	0.58					
Excluded factor						
16. I just think of it as some other sensation, such as numbness		0.67				
30. I don't think of it as pain but rather as a dull or warm feeling		0.62				
15. I relax		0.51				
41. I read		0.45				
35. I try to think about something pleasant		0.40				
Factor VII: Faith and praying						
22. I pray to God it won't last long			0.85			
24. I pray for the pain to stop			0.83			
45. I rely on my faith in God			0.71			
Factor VIII: Cognitive distraction						
48. I think of people I enjoy doing things with				0.79		
43. I replay in my mind pleasant experiences in the past				0.76		
40. I think of things I enjoy doing				0.49		
Excluded factor						
44. I take my medication					0.69	
36. I do anything to get my mind off the pain					0.53	
Excluded factor						
21. I take a shower or a bath						0.78
46. I use a heating pad						0.43

includes non-mental leisure activities aimed at becoming distracted from the painful perception. Composed of items 6, 9, 4, 8, 11 and 42, we call it Distracting behaviors. The third factor, called Self-instructions, refers to a series of self-verbalizations aimed at facing pain successfully (items 31, 3, 1, 10 and 28). Item 28 («No matter how bad it gets, I know I can handle it») originally loaded negatively in factor I, Catastrophization, but we have decided to include it in III, Self-instructions, for three reasons: it is more congruent theoretically with this last factor; it does not decrease the inner consistency of this factor (from $\alpha=0.80$ to $\alpha=0.77$) and it drastically increases factor I (from $\alpha=0.73$ to $\alpha=0.89$). The fourth factor suggests behaviors that aim to eliminate the influence of the pain in daily life; we call it Ignoring the pain (items 27, 32, 47, 23, 7, 5 and 33). The fifth factor, whose items reveal an intention to transform the painful perception to relieve its impact, receives the name of Reinterpreting the pain (items 17, 39, 20, 34, 19 and 25). The idea that the pain will disappear some day underlies the sixth factor; we call it Hope (item 13, 14 and 29). In the seventh factor, which we call Faith and Supplications (items 22, 24 and 45), coping is based on religious beliefs and behaviors. The last factor is based on mental activities of distraction, which, in the same time, seem to compensate the suffer-

ing produced by the pain; we call it Cognitive distraction (items 48, 43 and 40).

To obtain the score of factor IV, Ignoring pain, since item «47. I lie down» has a negative factorial load, and in order to avoid possible negative scores, 6 has been added to all the cases, so that the minimum score in this factor is 0.

The values of Cronbach's α internal consistency were 0.89 for factor I, 0.76 for II, 0.80 for III, 0.68 for IV, 0.80 for V, 0.77 for VI, 0.85 for VII and 0.74 for VIII. All were statistically significant (test F) at $p<0.01$ except for factor VIII, which was significant at $p<0.05$.

The results of the second order factorial analysis are shown in table 3. The resulting bifactorial structure explains 59% of the variance. The first factor is made up of six strategies and accounts for 38% of the total variance explained. It does not seem that the coping strategies are grouped either based on whether they are focused on the problem or on the emotion, and they are not active or passive or cognitive or behavioral. In order to understand their meaning, it was necessary to study the associations with other measures. Although some results will be described in a later section, we choose the name Adaptive coping for factor I due to its negative association with pain intensity, negative, anxious and depressed self-talk, pain behaviors and site of control by chance,

TABLE 3. Second order factorial structure of the Coping Strategy Questionnaire

	<i>I</i>	<i>II</i>
Factor I: Adaptive coping		
Self-instructions	0.75	(-0.32)
Cognitive distraction	0.73	
Distractor behaviors	0.73	
Reinterpreting the pain	0.71	
Ignoring the pain	0.64	(-0.51)
Hope	0.60	(0.37)
Factor II: Disadaptive coping		
Faith and supplications		0.78
Catastrophization		0.73

and positive with perceived self-efficacy. The second factor is made up of two strategies, that account for 21 % of the variance, and is justified in the opposite sense to that exposed by the first factor. It receives the name of disadaptive coping. The fact that the Hope factor was positively loaded stands out both in Adaptive coping as well as in Disadaptive coping (although much more in the former than in the latter).

Cronbach's α internal consistency values were 0.78 for the first factor and 0.46 for the second. Both were significant (F test) at $p < 0.01$.

Coping strategies scores

In table 4, the measurements and standard deviations obtained by the four groups diagnosed in the use of coping strategies, considered individually and globally, are shown.

In regards to the Catastrophization factor, patients with migraine and muscular origin pain present statistically greater scores than those with tension headache and bone origin pain ($F = 5.94$; $p < 0.001$). In distractor behaviors, those with headaches present lower means,

although not in a statistically significant way. There are also no significant differences in the use of Self-instructions or coping self-verbalizations, although the patients with bone pain make greater use of them. The scores in Ignoring the pain differ significantly from the two headache groups ($F = 5.8$; $p < 0.001$). Along the same line as in the two previous factors, bone pain is distinguished because it presents high scores. It seems that no group is characterized by excessively using Reinterpreting the pain strategy, especially the muscular pain group. In the factor Hope, the differences are also not statistically significant, although the bone pain and migraine groups stand out above the others. The scores in Faith and supplications are significantly greater in bone pain ($F = 2.61$; $p < 0.05$) than in tension headache, above all controlling the age effect ($F = 23.6$; $p < 0.0001$). Finally, in regards to specific strategies, the bone pain group is distinguished from the rest in the use of cognitive distraction, although there are no statistically significant differences.

Considering the compound scores, the bone pain group stands out because it presents a greater level of adaptive coping, exactly the opposite to the migraine group, although the difference is not statistically significant ($F = 2.49$; $p = 0.06$). On the contrary, patients with migraines and with muscular pain are distinguished (in regards to those with tension headache) because they perform a more disadaptive coping ($F = 3.33$; $p < 0.05$).

Construct validity of the Coping Strategies Questionnaire

Table 5 presents the correlations between coping strategies. Among the adaptive strategies (according to the second order factorization), as is logical, there are positive associations. Among these, those of Self-instructions factor with Ignoring the pain and Reinterpreting the pain as well as between the two strategies that imply distraction stand out. Among the disadaptive strategies (according to the second order factorization), a positive association logically appears. In relationship with the adaptive ones, Catastrophization is

TABLE 4. Scores in coping strategies for the different chronic pain diagnoses

	Range	MG	TTH	MD	BP	<i>p</i>
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	
Catastrophization	0-36	14.8 (10.5)	9.1 (9.5)	13.6 (9.8)	8.1 (7.5)	0.001
Distractor behaviors	0-36	6.9 (6)	8.6 (6.6)	11.5 (8.6)	13 (9.3)	n.s.
Self-instructions	0-30	14.1 (6.9)	15.6 (7.4)	14.7 (8.1)	17.9 (7.1)	n.s.
Ignoring the pain	0-42	14.5 (10.3)	21.6 (9.5)	16.6 (8.4)	18.9 (9.5)	0.001
Reinterpreting the pain	0-36	7.1 (7.9)	7.5 (6.9)	5.8 (5.8)	7.26 (7.2)	n.s.
Hope	0-12	9.7 (5.8)	8.7 (5.6)	8.1 (4.9)	10 (5.7)	n.s.
Faith and supplications	0-18	8.4 (6.3)	7 (6.4)	8.7 (5.7)	10.8 (6.2)	0.05
Cognitive distraction	0-18	6.1 (5.3)	5.7 (4.9)	5 (4.2)	7.9 (5.7)	n.s.
Adaptative coping	0-174	58.1 (30.2)	67.8 (29)	62 (26.2)	73.8 (35)	n.s.
Disadaptive coping	0-54	23.2 (14.5)	16.1 (12.3)	22.4 (13.3)	18.7 (11.4)	0.05

MG: migraine; TTH: tension headache; MD: muscular origin pain; BP: bone origin pain; M: arithmetic mean; SD: standard deviation; p: F test significance (univariate ANOVA).

TABLE 5. Association between coping strategies

	<i>CAT</i>	<i>DB</i>	<i>SELF</i>	<i>IP</i>	<i>RP</i>	<i>HOP</i>	<i>FP</i>	<i>COGD</i>
Catastrophization	-							
Distractor behaviors	-0.19**	-						
Self-instructions	-0.35**	0.45**	-					
Ignoring the pain	-0.39**	0.43**	0.56**	-				
Reinterpreting the pain	-	0.35**	0.54**	0.46**	-			
Hope	-	0.34**	0.30**	-	0.27**	-		
Faith and supplications	0.34**	-	-	-0.17*	-	0.29**	-	
Cognitive distraction	-	0.45**	0.36**	0.35**	0.39**	0.39**	0.23**	-

CAT: catastrophization; DB: distractor behaviors; SELF: self-instructions; IP: ignoring the pain; RP: reinterpreting the pain; HOP: hope; FP: faith and supplications; COGD: cognitive distraction. * $p < 0.05$; ** $p < 0.01$.

a strategy that is unmistakably associated negatively with them. However, the role of the Faith and Supplications strategy is more complex, since it is positively associated with two strategies such as Hope and Cognitive distraction.

Table 6 presents the correlations obtained between the coping strategies and different variables related to the experience of pain.

Considering the coping strategies, the first thing that stands out is the enormous significance of the Catastrophization factor (and, related with it, that of the second order disadaptive coping factor). In both, all the associations are positive except for the level of perceived self-efficacy, as was to be expected. However, a greater diversification of the control site appears in the disadaptive coping global factor, although the large weight of the random LOC is conserved. An identical weight and sense in the correlations appear in Faith and Supplications. This is the reason why we interpret the nature of the second global factor, made up of Catastrophization and Faith and Supplications, as disadaptive coping.

In regards to the adaptive strategies, its importance in our sample is less significant, although the associations found are of the sign expected. Self-instructions and Ignoring pain factors stand out for their multiple associations. Reinterpreting the pain and Hope factors stand out for the contrary.

Of the clinical variables, the pain intensity is associated to the half of the coping strategies, Catastrophization and Ignoring the pain, in the opposite senses, standing out. Treatment, although the associations are generally weak, is associated with the use of adaptive strategies, especially distractor behaviors.

Regarding the variables related to psychological conditions, the following stand out: associations of coping strategies with negative thoughts of incapacity and lack of control; with avoidance behavior and non-verbal complaint; with intolerability, helplessness, negative self-concept and concern for the future; with random control site and with perceived self-efficacy.

CONCLUSIONS

The first conclusion that we obtain in the present study is that, undoubtedly, the CSQ reappears as a valid

and reliable instrument. However, it is also clear that its psychometric properties depend on an adequate analysis of the structure that it adopts in each sample in which it is used. It is useful to assess pain coping strategies, however, which ones and how? If we consider the heterogeneity of the chronic pain syndromes, it seems reasonable to find four, five or six coping strategies that may be grouped into two or three «metastrategies». In our case, the plurality of diagnoses (up to thirty two) is greater than in almost all the studies published up to now, to which the fact that more than half of them are headaches is added.

We have identified eight strategies on factorizing on the individual items, which explain a high percentage of the total variance, superior, for example, to that obtained by Swartzman et al.²¹ It is reconfirmed that the theoretical structure initially established by Rosenstiel and Keefe¹⁷ (on which many second order factorizations are based) is not comparable to those obtained empirically, as has been documented on several occasions^{21,23,26}. In our case, only the Catastrophization strategy appears identical. Self-verbalizations of coping (we call it Self-instructions), Ignoring the pain and Reinterpreting the pain (the latter two with some exchange of items) are partially comparable. However, the discrepancies appear in regards to the four other strategies formulated by Rosenstiel and Keefe¹⁷. Two of them are diversified in our sample; the other two are simply distributed into other factors or disappear. In the case of their Praying and hoping strategy, there are two exact factors that appear in our sample. One is concerned with hope in a future without pain (Hope), while the other is based on prayer and faith in God (Faith and supplications), a discrimination based on religious elements being seen. In regards to their Diverting attention, the results of our study make it possible to distinguish between that which basically uses mental activity (Cognitive distraction) and the one that does not (Distractor behaviors). In this point, we should mention that items 4 («I count numbers in my head or run a song through my mind») and 8 («I play mental games with myself to keep my mind off the pain») seem to have been poorly interpreted, considering only the first part of their content, so that they are loaded in dis-

TABLE 6. Associations between coping strategies and other measures

	CAT	DB	SELF	IP	RP	HOP	FP	COGD	AC+	UC-
Clinical variables										
Pain intensity	0.45**	-0.25**	-0.22**	-0.39**	-	-	-	-	-0.30**	0.39**
Pain frequency	-	0.27**	-	-	-	-	0.17*	-	-	-
Treatment sessions	-	0.29**	-	-	0.16*	-	-	0.15*	0.17*	-
Negative thoughts										
General	0.64**	-	-0.31**	-0.20**	-	-	0.28**	0.17*	-	0.60**
Of social type	0.34**	-	-	-	-	-	0.20**	-	-	0.35**
Of incapacity	0.52**	-	-0.20**	-0.36**	-	-	0.33**	-	-	0.54**
Of lack of control	0.74**	-	-0.23**	-0.30**	-	-	0.31**	-	-0.19**	0.70**
Of self-blame	0.31**	-	-	-	0.15**	-	-	-	-	0.29**
Pain behaviors										
Complain non-verbally	0.48**	-	-	-0.34**	-	-	0.42**	-	-0.15*	0.55**
Avoid stimuli	0.32**	-0.17*	-	-0.30**	-	-	0.21**	-	-	0.34**
Complain verbally	0.21**	-	-	-	-	-	-	-	-	0.21**
Avoid activities	0.23**	-0.16*	-0.19**	-0.46**	-	-	-	-	-0.28**	0.22**
Cognitive anxiety										
Feel that the pain intolerable	0.79**	-	-0.23**	-0.29**	-	-	0.35**	-	-0.16*	0.75**
Concern for the future	0.64**	-	-0.15*	-0.27**	-	-	0.37**	-	-	0.65**
Feel guilty and confused	0.59**	-	-0.16*	-0.17*	-	-	0.29**	-	-	0.58**
Doubt of self-efficacy	0.55**	-	-	-	-	-	0.24**	-	-	0.52**
Cognitive sadness										
Negative self-concept	0.61**	-0.19**	-0.30**	-0.14*	-	-	0.19**	-	-0.19**	0.54**
Feel helpless	0.69**	-	-0.28**	-0.21**	-	-	0.29**	-	-0.15*	0.64**
Adapt poorly to pain	0.56**	-	-0.21**	-0.19**	-	-	0.23**	-	-	0.52**
Self-reproach	0.49**	-	-0.20**	-	-	-	0.21**	-	-	0.46**
Control beliefs										
Inner loc	-	-	-	-	-	-	-	0.16*	-	0.16*
Random loc	0.56**	-	-0.20**	-0.34**	-	-	0.34**	-	-0.24**	0.57**
Health professionals loc	-	-	-	-0.16*	-	0.29**	0.31**	-	-	0.22**
Perceived self-efficacy	-0.19**	-	0.22**	-	0.21**	-	-0.16*	-	0.21**	-0.22**

CAT: catastrophization; DB: distractor behaviors; SELF: self-instructions; IP: ignoring the pain; RP: reinterpreting the pain; HOP: hope; FP: faith and supplications; COGD: Cognitive distraction. AC+: adaptive coping; UC-: unadaptive coping. * $p < 0.05$; ** $p < 0.01$.

tractor behaviors and not in cognitive Distraction, which would have seemed to be more congruent. We have no proof of the diversification of these two coping strategies in any study. We hypothesize that it is due to the heterogeneity of diagnoses and to the weight of the headache cases in the sample, however this is something that still must be confirmed.

In regards to the two other strategies formulated by Rosenstiel and Keefe¹⁷, these do not have an entity as independent factors in our study. Half of the items of Increasing activity level and Increasing pain behaviors aimed at decreasing pain do not load in any interpretable factor. The other half are perfectly integrated into other factors such as Distractor behaviors or Ignoring the pain. This result appears in all the first order factorizations known^{21,23,26}.

The second order factorization appears to group the strategies according to coping efficacy. Thus, the names Adaptive coping and Disadaptive coping. The resulting structure makes it possible to explain a percentage of the variable that is somewhat less than that obtained by

Rosenstiel and Keefe¹⁷ or Gil et al.¹⁴, but quite superior to that of Soriano and Monsalve³⁵. There is one essential clarification: it is a proven fact that the nature of the coping strategies is not identifiable with their efficacy, but rather that the latter depends on the person in the stressful situation^{1,2}. Thus, it would be inexact to call our strategies adaptive or disadaptive; we only do so to stress that in our sample, they behave globally in this way. In some of the studies that obtain two second order factors, the structure is similar to ours²⁷, while in others, Faith and Catastrophization do not appear together¹⁴ or, simply, the structure is different³⁰. Among the trifactorial structures, our factor of Adaptive coping could be included in Cognitive coping and suppression, while our factor Disadaptive coping could be so in Hopelessness^{9,17,28, 29,35}. Our factor Hope merits special mention. It suggests both adaptive as well as disadaptive coping, although the former is more relevant.

The first and second order structures, empirically obtained on specific samples, are equally valid in the asses-

assessment of coping strategies. However, the first order structure permits a finer discrimination of the type of strategy used, independently of its efficacy, as has been demonstrated by Jensen et al.¹⁵

On the background of a major weight of disadaptive coping strategies, Catastrophization stands out for its enormous predictive power, as has been documented in many previous studies, although its nature as a coping strategy is being questioned, since it seems to function more as an assessment process¹⁸. Catastrophization and Faith and Supplications are the two copying strategies with greater conceptual meaning. Considered individually or jointly as Disadaptive coping, they imply a management of the pain characterized by abundance of negative, anxious, depressive inner speech, some limited control perception and self-efficacy as well as by the proliferation of pain behaviors of different nature. On the contrary, among the adaptive coping strategies, providing self-instructions against the pain, ignoring it or trying distraction behaviors are not characterized by the previous processes but completely on the contrary.

Coping seems more adaptive in the tension headache and bone pain diagnoses, strangely the two groups that differ most. As we do not have data on other investigations, we suggest two hypothesis: in the case of tension headache, it can be due to the lower clinical entity and impact in the daily life of the patient; in the case of bone origin pain, the only one of the four diagnoses where the existence of organic lesion is clear, this fact seems to point to a better understanding and adaptation to the disease, both personal as well as familial and social. Both groups catastrophize less and are more capable of ignoring the pain. On the contrary, migraine and muscular origin pain (priority for cases of fibromyalgia) are characterized by a more disadaptive coping in relationship with all the coping strategies. In addition, the bone pain group is the most hopeful, the most capable of getting distracted and of providing self-instructions to face the pain.

All of the previous conclusions show the richness and complexity of the painful perception, whose implications go beyond any conceptual or clinical reductionism, revealing the importance of examining and understanding what it means and how each persons faces the specific suffering.

REFERENCES

- Lazarus RS. Stress, appraisal, and coping. New York: Springer, 1984.
- Lazarus RS. Stress and emotion. A new synthesis. New York: Springer, 1999.
- Rodríguez Franco L, Cano García FJ. Papel del psicólogo en el abordaje del dolor. Actualizaciones en Dolor 2001; 2(4):279-88.
- Turner JA, Dworkin SF, Mancl L, Huggins KH, Truelove EL. The roles of beliefs, catastrophizing and coping in the functioning of patients with temporomandibular disorders. Pain 2001;92:41-51.
- Williams DA, Thorn BE. An empirical assessment of pain beliefs. Pain 1989;36:351-8.
- Ferrer Pérez VA, González Barrón R, Soler-Herreros E. Evaluación de creencias sobre dolor en pacientes con dolor crónico y su modulación por las experiencias previas. C Med Psicosom 1997;41:15-24.
- Gil KM, Williams DA, Keefe FJ, Beckham JC. The relationship of negative thoughts to pain and psychological distress. Behav Ther 1990;21:349-62.
- Boston K, Pearce SA, Richardson PH. The pain cognitions questionnaire. J Psychosom Res 1990; 34(1):103-9.
- Barry T, Elander J. Pain coping strategies among patients with haemophilia. Psychol Health Med 2002;7(3):271-81.
- Haythornthwaite JA, Menefee LA, Heinberg LJ, Clark MR. Pain coping strategies predict perceived control over pain. Pain 1998;77(1):33-9.
- Jensen MP, Turner JA, Romano JM. Self-efficacy and outcome expectancies: relationship to chronic pain coping strategies and adjustment. Pain 1991;44:263-9.
- Lin CC. Comparison of the effects of perceived self-efficacy on coping with chronic cancer pain and coping with chronic low back pain. Clin J Pain 1998; 14(4):303-10.
- Keefe FJ, Kashikar Zuck S, Robinson E, Salley A, Beupapre P, Caldwell D, et al. Pain coping strategies that predict patients' and spouses' ratings of patients' self-efficacy. Pain 1997;73(2):191-9.
- Gil KM, Abrams MR, Phillips G, Keefe FJ. Sickle cell disease pain: relation of coping strategies to adjustment. J Consulting Clin Psychol 1989;57(6):725-31.
- Jensen MP, Turner JA, Romano JM. Chronic pain coping measures: Individual versus composite scores. Pain 1992; 51(3):273-80.
- Geisser ME, Robinson ME, Henson CD. The Coping Strategies Questionnaire and chronic pain adjustment: a conceptual and empirical reanalysis. Clin J Pain 1994;10(2): 98-106.
- Rosenstiel AK, Keefe FJ. The use of cognitive coping strategies in chronic low back pain patients: relationship to patient characteristics and current adjustment. Pain 1983; 17:33-44.
- Stewart MW, Harvey ST, Evans IM. Coping and catastrophizing in chronic pain: a psychometric analysis and comparison of two measures. J Clin Psychol 2001;57(1): 131-8.
- Snow-Turek AL, Norris MP, Tan G. Active and passive coping strategies in chronic pain patients. Pain 1996;64(3): 455-62.
- Lefebvre JC, Lester N; Keefe FJ. Pain in young adults: II. The use and perceived effectiveness of pain-coping strategies. Clin J Pain 1995;11(1):36-44.
- Swartzman LC, Gwadry FG, Shapiro AP, Teasell RW. The factor structure of the Coping Strategies Questionnaire. Pain 1994;57(3):311-6.
- Jensen IB, Linton SJ. Coping Strategies Questionnaire (CSQ): Reliability of the Swedish version of the CSQ. Scand J Behav Ther 1993;22(3-4):139-45.
- Tuttle DH, Shutty MS, DeGood DE. Empirical dimensions of coping in chronic pain patients: a factorial analysis. Rehab Psychol 1991;36(3):179-88.
- Lawson K, Reesor KA, Keefe FJ, Turner JA. Dimensions of pain-related cognitive coping: cross-validation of the factor structure of the Coping Strategy Questionnaire. Pain 1990;43:195-204.
- Tan G, Jensen MP, Robinson-Whelen S, Thornby JI, Monga TN. Coping with chronic pain: a comparison of two measures. Pain 2001;90(1-2):127-33.

26. Santavirta N, Bjoervell H, Koivumaeki EA, Hurskainen K. The factor structure of coping strategies in hemophilia. *J Psychosom Res* 1996;40(6):617-24.
27. Neves MG. Coping with phantom limb pain. Dissertation Abstracts International: section B. *Sci Engineer* 2001;62:2071.
28. Hill A. The use of pain coping strategies by patients with phantom limb pain. *Pain* 1993;55(3):347-53.
29. Burckhardt CS, Henriksson C. The Coping Strategies Questionnaire-Swedish version: evidence of reliability and validity in patients with fibromyalgia. *Scand J Behav Ther* 2001;30(3):97-107.
30. Riley JL, Robinson ME, Geisser ME. Empirical subgroups of the Coping Strategies Questionnaire-revised: a multi-sample study. *Clin J Pain* 1999;15(2):111-6.
31. Dozois DJA, Dobson KS, Wong M, Hughes D. Predictive utility of the CSQ in low back pain: individual versus composite measures. *Pain* 1996;66(2-3):171-80.
32. Main CJ, Waddell G. A comparison of cognitive measures in low back pain: statistical structure and clinical validity at initial assessment. *Pain* 1991;46(3):287-98.
33. Gil KM, Williams DA, Thompson RJ, Kinney TR. Sickle cell disease in children and adolescents: the relation of child and parent pain coping strategies to adjustment. *J Pediatr Psychol* 1991;16(5):643-63.
34. Keefe FJ, Caldwell DS, Martínez S, Nunley J. Analyzing pain in rheumatoid arthritis patients: pain coping strategies in patients who have had knee replacement surgery. *Pain* 1991;46(2):153-60.
35. Soriano J, Monsalve V. Valoración, afrontamiento y emoción en pacientes con dolor crónico/assessment, coping and emotion in patients with chronic pain. *Boletín de Psicología* 1999;62:43-64.
36. International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalalgia* 1988;8(Suppl 7):1-96.
37. Cano García FJ, Rodríguez Franco L. Pensamientos negativos automáticos en el dolor crónico. *Psiquis* 2003;24(3):137-45.
38. Appelbaum KA, Radnitz CL, Blanchard EB, Prins A. The Pain Behavior Questionnaire (PBQ): a global report of pain behavior in chronic headache. *Headache* 1988;28:53-8.
39. Rodríguez Franco L, Cano García FJ, Blanco Picabia A. Conductas de dolor y discapacidad en migrañas y cefaleas tensionales. Adaptación española del Pain Behavior Questionnaire (PBQ) y del Headache Disability Inventory (HDI). Análisis y modificación de conducta 2000;26(109):739-62.
40. Kendall PC, Hollon SD. Anxious self-talk: development of the Anxious Self-Statements Questionnaire (ASSQ). *Cognit Ther Res* 1989;13(1):81-93.
41. Cano García FJ, Rodríguez Franco L. Evaluación del lenguaje interno ansiógeno y depresógeno en la experiencia de dolor crónico. *Apuntes de Psicología* 2002;20(3):329-46.
42. Hollon SD, Kendall PC. Cognitive self-statements in depression: development of an automatic thoughts questionnaire. *Cognit Ther Res* 1980;4(4):383-95.
43. Martín NJ, Holroyd KA, Penzien DB. The Headache-Specific Locus of Control Scale: adaptation to recurrent headaches. *Headache* 1990;30:729-34.
44. Cano García FJ. Variables psicológicas implicadas en migraña y cefalea tensional. Un estudio comparativo con otros trastornos por dolor crónico. Tesis doctoral no publicada. Universidad de Sevilla, 2001.
45. Martín NJ, Holroyd KA, Rokicki LA. The Headache Self-Efficacy Scale: adaptation to recurrent headaches. *Headache* 1993;33:244-8.