

Reports of Memory Functioning by Patients With Chronic Pain

María Muñoz* and Rosa Esteve†

Objectives: Patients with chronic pain often complain of memory and concentration difficulties. The purpose of this study was to explore the influence of a set of variables that previous research has associated with memory complaints in patients with chronic pain: anxiety and depression, benzodiazepine use, chronicity of pain, and age. Special attention is paid to catastrophizing and to the differential role played by its 3 components: magnification, helplessness, and rumination.

Methods: The Pain Catastrophizing Scale, the Hospital Anxiety and Depression Scale, and the Questionnaire d'auto-évaluation de la Mémoire were administered to 149 patients with benign chronic pain.

Results: The most frequently reported memory complaints included flaws referring to films and books (61%); forgetfulness (44%); handling of everyday things (38%); and flaws about conversations (38%). Regression analyses showed that depression accounted for the largest proportion of variance in memory complaints (35%) followed by anxiety (6%) and rumination (2%).

Conclusion: The results support the hypothesis that emotional distress (depression and anxiety) plays an important role in memory complaints in patients with chronic pain, as well as rumination, the intrusive component of catastrophizing. Clinicians should be aware of these factors in the evaluation of memory complaints in patients with chronic pain.

Key Words: anxiety, catastrophizing, depression, chronic pain, memory complaints, rumination

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Memory complaints (ie, perceived difficulties in remembering) seem to be an important source of worry in patients with chronic pain. They have been found to be significantly related to conflicts and disharmony at home, anxiety, depression, irritability, low satisfaction with social and sexual

activities, interference with daily activities, and disability.^{1–4} Nevertheless, despite their important consequences, only a few studies have investigated memory complaints in patients with chronic pain.^{1,4,5}

Emotional distress, and especially depression, has been invoked as an explanation of memory complaints in elderly adults. It has been suggested that the depressed individual's belief regarding poor memory may be a function of the negative self-evaluations depressed individuals frequently make about themselves and their abilities. Hubbard⁶ found that measures of depression were significantly correlated with memory complaints and had no relation to the patients' objective memory test performance. Nevertheless, Schnurr and MacDonald⁵ found differences in memory complaints between patients with pain and controls, even after the effects due to depression were statistically removed. McCracken and Iverson's⁴ results showed that depression, antidepressant use, and pain-related anxiety accounted for 36.0% of the variance in memory complaints.

Several studies have shown that memory complaints are unrelated to pain intensity.^{1,4,7} The role of opioids and psychotropic drugs has been investigated in patients with chronic pain because of their potential action on memory, although the evidence is contradictory.^{8–14} The few studies on the relationship between memory complaints and medication use showed no significant effects.^{4,5}

Research over the past 2 decades has revealed that catastrophizing is a very strong predictor of adaptation to chronic pain.^{15–17} Sullivan et al¹⁸ distinguished 3 dimensions of the construct: magnification, rumination, and helplessness. To our knowledge, no study has investigated the role of catastrophizing in memory complaints in patients with chronic pain. Only few studies have investigated the role of pain catastrophizing in cognitive functioning. Crombez et al^{19,20} found that the power of threatening information to interrupt attentional engagement was greater for catastrophizers, and this effect remained significant after controlling for the effects of negative affectivity. Recently, Grisart and Van der Linden¹³ found that the memory performance of patients with chronic pain was significantly related to the escape/avoidance scale of the Pain Anxiety Symptoms Scale and the magnification scale of the Pain Catastrophizing Scale.

As previously mentioned, the determinants of memory complaints have been insufficiently studied. The purpose of this study was to explore the influence of a set of variables that previous research has associated with memory complaints in patients with chronic pain: anxiety and depression, benzodiazepine use, chronicity of pain, age, and catastrophizing, with special attention to the differential role played its 3 components.

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From the *Servicio de Psiquiatría, H.U. Carlos Haya, Málaga, Servicio Andaluz de Salud, Málaga, Spain, and †Departamento de Personalidad, Evaluación y Tratamiento Psicológicos, Facultad de Psicología, Universidad de Málaga, Málaga, Spain.

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Reprints: Rosa Esteve, Departamento de Personalidad, Evaluación y Tratamiento Psicológicos, Facultad de Psicología, Universidad de Málaga, Campus de Teatinos, Málaga 29071, Spain (e-mail: zarazaga@uma.es).

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MATERIALS AND METHODS

Patients

Patients were recruited from the Clinical Pain Unit at the Carlos Haya Hospital in Málaga, Spain. Doctors referred them to the study, and none refused participation. Exclusion criteria were neoplastic disease, history of severe psychopathologic disturbances, previous and present cerebral disease, or head injury. 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.

The sample consisted of 149 patients with chronic pain. Demographic and clinical data are summarized in Table 1. Women were more numerous in our sample than men (28.2% male, 71.8% female). As previous studies showed,²¹ this dis-

tribution of sexes is typical of all patients who attend this clinic.

According to Cohen,²² the size of the sample gives high power to the multiple regression analysis (0.90) to detect medium-size effects (0.15) at a 0.01 significance level with 144 degrees of freedom. That is, the sample size is sufficiently large such that, in this case, and with an acceptable level of significance, *F* is a powerful test with a high probability of rejecting the null hypothesis.

Measurements

The Hospital Anxiety and Depression Scale (HAD)^{23,24} is made up of 2 scales: anxiety and depression. The Spanish version of the scale showed appropriate reliability and validity.²⁴ Pincus et al²⁵ strongly recommend the use of this instrument to assess anxiety and depression in chronic pain populations.

The Pain Catastrophizing Scale (PCS)^{18,26–29} consists of 3 subscales assessing rumination, magnification, and helplessness, and also offers a total score regarding catastrophizing. Magnification refers to the tendency to exaggerate the threat value or seriousness of pain sensations.³⁰ Rumination relates to the inability to divert attention away from pain.³¹ Finally, helplessness refers to pessimism in relation to one's ability to cope with pain.³²

The questionnaire was translated into Spanish by the authors of this paper following the original instrument³³ as closely as possible. Alpha reliability was calculated for the total PCS and for each subscale of the Spanish translation.³⁴ Internal consistency was high (rumination, $\alpha = 0.89$; helplessness, $\alpha = 0.90$; magnification, $\alpha = 0.79$; total PCS, $\alpha = 0.95$).

The Spanish version of the Questionnaire d'auto-évaluation de la Mémoire by Van der Linden et al³⁵ (Cuestionario de Olvidos Cotidianos, COC³⁶) was used to assess memory complaints. This instrument consists of 68 items describing common memory flaws referring to conversations, films, people, things, current events, places, actions, the interviewee's own life, forgetfulness, and flaws in general. Patients are asked to rate the frequency with which they experienced each memory flaw. The internal consistency of the total scale was high ($\alpha = 0.96$). The manual provides detailed norms for score interpretation.

RESULTS

Descriptive Analyses

As Table 1 shows, the mean score on the HAD subscale of depression ($M = 6.36$) is considered as no case (≤ 7) and is close to the cutoff point for dubious cases (8). The mean score regarding anxiety ($M = 11.38$) is clearly in the range established as a case (≥ 11); therefore, taking into account normative data, the patients presented a high degree of anxiety. Likewise, in comparison with the healthy population, the patients in our sample showed high levels of catastrophizing. The mean score regarding catastrophizing in our sample was 20.85, which is higher than the mean scores obtained from the validation studies of the PCS for healthy subjects ($M = 13.87$).²⁷ The subscale mean scores were also significantly higher in our sample (Helplessness, $M = 10.02$; Magnification,

TABLE 1. Means, Standard Deviations, and Frequency Data for the Variables

Variables (N = 149)	Mean (N)	SD (%)
Demographic and clinical variables		
Sex [N (%)]		
Male	42	(28.2)
Female	107	(71.8)
Marital status		
Married	108	(72.5)
Widowed	23	(15.4)
Single	14	(9.4)
Divorced	4	(2.7)
Education		
Reading and writing	58	(38.9)
Primary school	60	(40.3)
High school	16	(10.7)
University education	15	(10.1)
Diagnosis		
Neuropathic pain	50	(34)
Bone pain	48	(32)
Joint pain	30	(20)
Visceral pain	6	(4)
Headaches	6	(4)
Vascular pain	6	(4)
Fibromyalgia	3	(2)
Predictor variables		
Catastrophizing (PCS)	20.85	16.32
Helplessness (PCS)	10.02	7.79
Magnification (PCS)	3.82	3.90
Rumination (PCS)	7.01	5.56
Depression (HAD)	6.36	5.70
Anxiety (HAD)	11.38	6.33
Medication		
Benzodiazepines	88	(59.1)
No benzodiazepines	61	(40.9)
Pain chronicity (mos)	139.58	134.08
Age (yrs)	59.22	14.96
Dependent variable		
Memory complaints	166.01	67.19

M = 3.82; Rumination, M = 7.01) in comparison with the healthy validation sample (Helplessness, M = 4.78; Magnification, M = 3.20; Rumination, M = 5.89).

The mean for memory complaints is 166, and the standard deviation is 67. In this study, at the individual level, the majority of the patients showed severe impairment on at least 1 subscale. Memory complaints were significant regarding flaws about films and books (61% of the sample above percentile 70); forgetfulness (44% above percentile 70); flaws about the handling of everyday things (38% above percentile 70); and 38% of the patients scored above percentile 70 in memory flaws about conversations.

The intercorrelations are very high among the subscales of the catastrophizing variable, low for the age variable, and moderately high for the rest of the variables (Table 2).

Regression Analysis

As mentioned, the main aim of the present study was to examine the association of catastrophizing with memory complaints in patients with chronic pain. The influence of other clinical variables was examined besides the components of catastrophizing. A multiple regression analysis was performed with the following independent variables: magnification, helplessness, rumination, anxiety, depression, benzodiazepine use, chronicity of pain, and age.

Intercorrelations between the components of catastrophizing, anxiety, and depression were high (Table 2), ie, rumination and helplessness ($r = 0.86$), magnification and depression ($r = 0.57$). To avoid possible problems with multicollinearity, stepwise regression was carried out in which the order of variables included in the equation is not specified but is determined by the magnitude of bivariate correlations. Table 3 summarizes the results of the stepwise regression. As shown, depression was entered in the first step and accounted for 35% of the variance in memory complaints scores. Anxiety was entered in the second step and explained an additional 6% of the variance. Finally, rumination made a statistically significant, but small, contribution to the explanation of variance in memory complaints (change in $R^2 = 0.02$). The procedure halted without including the rest of the variables because they did not add significantly to the variance explained.

DISCUSSION

In line with previous results,^{4,6} we found that anxiety and depression seem to play an important role in memory complaints in patients with chronic pain. Specifically, regression analyses showed that depression accounted for the largest proportion of variance in memory complaints ($R^2 = 0.35$). In this vein, it has been suggested that memory complaints in patients with chronic pain could be uniquely explained by depression because depressed individuals frequently make negative self-evaluations about themselves and their abilities. Dufton⁷ suggested that, in patients with chronic pain, reports of cognitive and affective difficulties might reflect a “complaining” response set. McCracken and Iverson⁴ compare these results with results from studies of physical complaints in persons with chronic pain, showing that these too are strongly associated with emotional distress. As these authors emphasized, it can be expected that memory complaints will decline if emotional distress is alleviated. In fact, our results agree with numerous studies in elderly people and patients suffering a wide range of medical conditions that found that anxiety and depression accounted for memory complaints.^{37–40}

The present study considered the potential influence of benzodiazepine use because, although the evidence is contradictory, some research found that benzodiazepines have a deleterious effect on memory functioning that could translate into memory complaints. Our results, however, did not show a significant relationship between benzodiazepine use and memory complaints. Age and pain chronicity did not contribute to the explanation of memory complaints either.

Finally, of the 3 components of catastrophizing, only rumination made a statistically significant, but small, contribution to the explanation of variance in memory complaints. Rumination is the component of catastrophizing that specifically refers to thought intrusion; patients feel that pain thoughts intrude into their minds, and they cannot avoid them. In this line, it must be borne in mind that the only 2 studies that have dealt with the influence of pain catastrophizing on cognitive functioning both invoke attention mechanisms to explain the disruptive effect of catastrophizing on cognitive performance.^{13,19}

Helplessness and magnification did not significantly contribute to explaining memory complaints. These results could

TABLE 2. Intercorrelations Among the Variables

	Memory	Anxiety	Depression	Catastrophizing	Helplessness	Magnification	Rumination	Age	Benzodiazepine
Anxiety	0.53*								
Depression	0.60*	0.52*							
Catastrophizing	0.47*	0.47*	0.51*						
Helplessness	0.43*	0.45*	0.49*	0.97*					
Magnification	0.51*	0.54*	0.57*	0.90*	0.81*				
Rumination	0.42*	0.36*	0.41*	0.95*	0.86*	0.80*			
Age	0.03	-0.23†	0.00	-0.12	-0.15	-0.13	-0.05		
Benzodiazepine	-0.17	-0.16	-0.03	-0.08	-0.11	-0.05	-0.06	0.09	
Pain chronicity	0.12	0.10	0.03	-0.12	-0.09	-0.10	-0.16	0.16	-0.03

* $P < 0.001$.

† $P < 0.01$.

TABLE 3. Summary of Stepwise Regression Analysis for Variables Predicting Memory Complaints

Variables	B	SE B	β	R ^{2*}	R ² Change	F	df	P
Step 1								
Depression	7.07	0.78	0.60	0.35	—	81.67	1,147	0.000
Step 2								
Depression	5.23	0.87	0.44					
Anxiety	3.16	0.78	0.30	0.41	0.06	53.22	2,146	0.000
Step 3								
Depression	4.63	0.89	0.39					
Anxiety	2.80	0.78	0.26					
Rumination	2.06	0.83	0.17	0.43	0.02	38.77	3,145	0.000

*Adjusted R².
—, data not available.

be interpreted in the light of the debate on conceptually distinguishing between catastrophizing and variables of emotional distress.^{18,41} Helplessness and depression share the element of negative self-evaluation, and in this sense, perhaps, both constructs overlap (at least as measured in this study). Magnification, as the tendency to exaggerate the threat of pain, could overlap with the measure of anxiety.

These findings may be limited regarding their ability to be generalized. This sample consisted of a group of patients admitted to a Pain Unit who presented a high degree of physical impairment and pain intensity. Hence, the findings may not generalize to pain patients from different clinical settings, particularly among patients whose functioning is only mildly or moderately impaired. Likewise, women are more numerous in our sample than men, which could influence our results as catastrophizing is higher in women.^{26,42,43} As mentioned, the composition of our sample is representative of the population who attend the Clinical Pain Unit at the Carlos Haya Hospital in Málaga.

The patients' low level of education is another circumstance that could have an influence on memory impairment and hence on memory complaints; nevertheless, the instrument used to measure memory complaints is not affected by educational level.³⁶

In clinical practice, patients with chronic pain often complain of their "poor memory" and describe their memory failures as very unpleasant and distressing. Furthermore, in the course of psychologic treatment, they often view memory impairment as an insurmountable obstacle to engaging in meaningful goals because, perceiving themselves to be impaired, they may not feel secure engaging in normal activities and may withdraw from them.⁴ Frequently, they feel that memory impairment is an unavoidable side effect of medication. Here, the clinicians should carefully evaluate the extent to which memory complaints are influenced by emotional distress and change the patients' beliefs about the causes of their memory flaws; as memory complaints are related to emotional distress, it can be expected that memory complaints will decline if depression and anxiety are alleviated. It is important to make the patient understand that they do not have to choose between suffering pain and memory impairment. In addition, according to our

results, regarding the evaluation of memory complaints in patients with chronic pain, clinicians also should be aware of the presence of intrusive thoughts and of attempts at avoidance.

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