

BMJ Open Nationwide cross-sectional study of the impact of chronic pain on an individual's employment: relationship with the family and the social support

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ABSTRACT

Objectives: To determine the prevalence and the factors related to sick leave and job loss among individuals suffering from chronic pain (CP), and to analyse specifically the effect of family and social support on the individual's employment.

Design: Observational cross-sectional study.

Setting: Data were collected using structured computer-assisted telephone interviews between February and June 2011.

Participants: A nationwide study of 1543 Spanish adults of working age (<65), 213 of whom suffered from CP (pain suffered at least 4 or 5 days a week during the past 3 months, according to the criteria of the International Association for the Study of Pain (IASP)).

Main outcome measure: Information was collected regarding the individual's sociodemographic status, pain characteristics, healthcare use and satisfaction, limitations in daily activities, mood status, perception of the impact of pain on their families, and their satisfaction with the family and social support. To identify factors associated with sick leave and job loss among those suffering CP, 2 logistic regression models were generated.

Results: The prevalence of sick leave due to CP in the general Spanish population was 4.21% (95% CI 3.2% to 5.2%). Sick leave were more likely for individuals who considered their family were affected by their pain (OR=2.18), needed help to dressing and grooming (OR=2.98), taking medication (OR=2.18), had a shorter pain duration (OR=0.99) and higher educational level. The prevalence of job loss due to CP was 1.8% (95% CI 1.1% to 2.5%). It was related to feelings of sadness (OR=4.25), being unsatisfied with the care provided by health professionals (OR=2.60) and consulting a doctor more often due to CP (OR=1.09).

Conclusions: CP is negatively associated with an individual's employment. This detrimental effect could be ameliorated if the factors related to sick leave and job loss provoked by CP are identified, especially those related to the effect of CP on the family and social environment.

Strengths and limitations of this study

- The study used data from a nationwide cross-sectional survey of a Spanish population, representing a large sample: N=1543.
- This is the first study to analyse the prevalence of sick leave and job loss due to chronic pain (CP) in the general Spanish population, and to identify factors related to the family environment that contribute to the sick leave taken and job loss of individuals with CP.
- No data related to the individual's workload or presenteeism were obtained as it is difficult to assess these issues in telephone interviews.

INTRODUCTION

Chronic pain (CP) is a health problem that has reached worldwide epidemic proportions, affecting 19%¹ of the population in Europe, and between 12%¹ and 16.6%² of the adult Spanish population. Studies carried out in various countries have shown that CP is associated with the individual's quality of life, significantly limiting their activities^{3 4} and impeding them from maintaining an independent lifestyle.¹ In addition, individuals suffering from CP often experience mental disturbances^{2 5} and their family environment may also be severely affected.⁶

CP also influences an individual's employment, which may ultimately imply a significant financial burden. In Spain it has been estimated that people with CP are absent from the workplace 40% more than individuals who do not suffering from pain, and that they are 30% less productive.⁷ Likewise, various studies that have analysed the cost of CP have shown that the total costs represent 2% of the gross domestic product (GDP) in European countries,⁸ these costs including the direct costs associated to treatment and care,⁹

the indirect costs associated with sick leave and presenteeism, and the intangible costs related to quality of life.^{10–12} Indeed, in Spain it is estimated that the annual economic cost of CP is over €3000 million, 2.5% of the national GDP.¹³

Different factors have been associated with the effects of CP, such as the individual's working environment,¹⁴ the impact of pain on the family and poor family support.^{15 16} Indeed, these latter factors have been associated with longer pain duration, more severe pain and more painful sites.² Yet to the best of our knowledge, how these factors are related to the effects of CP on employment has been only assessed using a qualitative approach in individuals with back pain.^{17–19} Thus, in this study, we first aimed to analyse the prevalence of sick leave and job loss due to CP in the Spanish population. Subsequently, we set out to identify variables associated with these employment problems, particularly the effect of the family and the individual's perception of the social support they receive.

METHODS

Study design

This study is a secondary analysis of the data collected in a cross-sectional study that was carried out on a representative sample of the general Spanish population. The data were obtained with the aim of determining the prevalence of CP in this population.²

Study population

The original study included 1957 men and women at least 18 years of age. Here, we restricted the population to those of working age (>18 and <65 years of age), a subsample of 1543 participants.

Sampling method

Multistage stratified sampling was used in this study, carrying out participant selection in four phases.

In the first sampling phase, strata were constructed according to the classification of the Spanish territory into four areas. This division was based on population ageing criteria that was derived from the ratio between the population older than 65 years of age and that younger than 15. The 'ageing' criterion was considered together with that of 'geographical area', given that both these factors have previously been demonstrated to be associated with pain prevalence.^{20 21}

During the second sampling phase, the number of towns within each stratum was determined, classifying the towns into four groups according to their population (<5000; 5000–20 000; 20 000–50 000; >50 000). Subsequently, towns were selected randomly in proportion to the total number in the group.

In the third phase, sampling units (telephone numbers) were selected randomly from each town chosen using the list of telephone numbers included in the Infobel España Office V.7.1 directory (Kapitol S.A.

Uccle, Brussels). In this way, our target population represented ~90% of Spanish homes with a landline supplied by any telephone company, which in turn represented 80.6% of all Spanish homes. Therefore, the final percentage of the eligible Spanish population accessed was 72.5%.

In a fourth sampling phase, the participants interviewed from their homes were selected randomly according to the previously established sex and age quotas. As a criterion for the choice of a respondent within the home, the first individual answering the phone was always chosen as long as they belonged to one of the strata of the population considered in the study and provided that this stratum was not already completed. If the person chosen was unavailable at that time, we asked them to arrange the interview for another more suitable moment. Before the interview, all participants included in the study gave their informed consent.

Three attempts were made to contact a home number before it was dismissed, calling at different times of the day. If no contact was established, the phone number was substituted by another in the same group.

The sample size necessary to achieve adequate statistical power was not specifically calculated for this study given that the data used were collected in an earlier study to determine the prevalence of CP in Spain in which the specific sample size required was calculated.²

Data collection and measures

Data were collected between February and June 2011 by trained interviewers that used structured computer-assisted telephone interviews. The questionnaire employed was based on information from distinct surveys carried out previously in Spain (see online supplementary 1).^{22 23} One screening question was used to identify the people with CP in accordance with the criteria of the International Association for the Study of Pain (IASP), and an individual was considered to have CP if he/she had suffered pain on at least 4 or 5 days a week during the past 3 months. Two questions were included in the questionnaire, to determine the frequency of sick leave in the study population, or whether the individual had left or lost their job in the last year due to CP: 'Have you needed to request any sick leave because of your pain in the last year?'; 'Have you left or lost your job because of your pain in the last year?' The responses to these questions were coded as 'yes' or 'no'.

The data collected included: sociodemographic data (age, sex and academic level); the characteristics of the pain (intensity, duration and localisation of the painful sites) and healthcare information (use of pain relief medication, number of medical consultations in the last year and opinion on the care received from the healthcare system). Pain intensity was measured using a scale of four categories: mild, moderate, severe and unbearable pain.²⁴ Limitations in daily activities, and the effect of pain on the individual's mood and anxiety status were also explored through seven questions in the questionnaire.

Table 1 Characteristics of the study population (N=213 people with chronic pain)

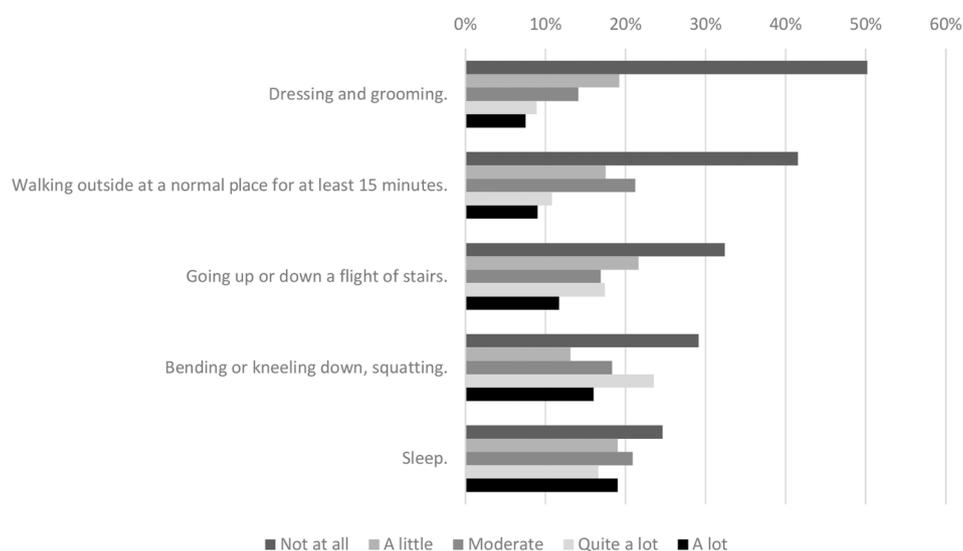
Variables	Categories	N	Per cent
Sociodemographic data			
Age (N=213)	18–44	91	42.7
	45–64	122	57.3
Age (N=211)	Mean (SD)	47.9	(10.96)
Sex (N=213)	Male	49	23.0
	Female	164	77.0
Educational level (N=210)	No education received	15	7.1
	Primary studies	50	23.8
	Secondary studies	70	33.3
	Vocational training	36	17.1
	University studies	39	18.6
Pain			
Duration of pain (years, N=212)	Mean (SD)	8.99	(9.40)
	Median in years	5	
Number of sites of pain (N=212)	1 location	120	56.6
	More than 1 location	92	43.4
The most affected pain site (N=212)	Widespread pain	34	16.0
	Head	25	11.8
	Neck (cervical vertebrae)	17	8.0
	Back	49	23.1
	Limbs and/or joints	70	33.3
	Chest	4	1.9
	Abdomen	8	3.8
	Other	5	2.4
Pain intensity (N=211)	Slight or very slight	11	5.2
	Moderate	94	44.5
	Severe	75	35.5
	Unbearable	31	14.7
Number of medical pain consultations in the last year (N=199)	Mean (SD)	3.60	(4.139)
Currently taking pain relief medication (N=213)	No	67	31.5
	Yes	146	68.5
Opinion on the care received (N=196)	Very unsatisfied	12	6.1
	Unsatisfied	21	10.7
	Neither satisfied nor dissatisfied	35	17.9
	Satisfied	85	43.4
	Very satisfied	43	21.9
Mood			
Sadness (N=213)	Not at all	62	29.1
	A little	37	17.4
	Some	51	23.9
	Quite a lot	38	17.8
	A lot	25	11.7
Anxiety and distress (N=212)	Not at all	64	30.0
	A little	41	19.3
	Some	41	19.3
	Quite a lot	39	18.4
	A lot	27	12.7
Family and social environment			
The individual considers that his/her pain affects his/her family (N=212)	Not at all	111	52.4
	A little	27	12.7
	Some	39	18.4
	Quite a lot	27	12.7
	A lot	8	3.8
Impact on relationships with friends (N=212)	The relationship has been lost because of my pain	8	3.8
	The relationship has deteriorated	39	18.4

Continued

Table 1 Continued

Variables	Categories	N	Per cent
Satisfaction with the support received from the family (N=213)	Nothing has changed in the relationship	164	77.4
	The relationship has improved	1	0.5
	Very unsatisfied	4	1.9
	Unsatisfied	7	3.3
	Neither satisfied nor dissatisfied	38	17.8
	Satisfied	91	42.7
Employment environment Sick leave (N=206)	No	141	66.2
	Yes	65	31.6
Left or lost employment (N=207)	No	179	84%
	Yes	28	13.5

Figure 1 Limitations to daily life activities among the study individuals.



In addition, the impact of CP on the individual's family and their relationships with their friends were evaluated through two questions: 'How do you consider your pain affects your family?'; and 'Has your pain affected your relationships with friends?' To define the individual's satisfaction with the family support they receive, they were also asked: 'Are you satisfied with the support provided by your family?'

Statistical analysis

A descriptive analysis of the variables studied was performed, calculating the frequency, central tendency and dispersion. Differences between the groups were evaluated with the χ^2 test for categorical variables, and a Mann-Whitney U test was used to test continuous variables with a non-normal distribution. For all the tests, $p \leq 0.05$ was considered significant.

Two logistic regression models were set-up to analyse the association between pain and sick leave (model 1), and that between pain and the loss of employment (model 2), targeting sick leave and job loss as the

dependent variable. The criteria used to select the covariates included in these models were both statistical (a significant difference observed in the bivariate analysis: $p < 0.05$) and clinical (previously shown in the literature). In addition, to facilitate the interpretation of the model, the categories of the variables related to functional limitations, mood and the effect of CP on the individual's family were dichotomised as 'yes' or 'no'. Similarly, the variable related to family support was grouped into two categories: 'satisfied' or 'unsatisfied'.

RESULTS

General characteristics of individuals suffering from chronic pain

Of the 1543 participants interviewed (response rate 36.9%), 213 suffered from CP according to the criteria used in this study, their average age was 47.9 years (SD 10.9) and 77% of them were women. Among the individuals suffering CP, 43.4% experienced pain at multiple locations, the most common sites being the limbs and

Table 2 Bivariate analysis of the factors related to sick leave request

Variables	Categories	Sick leave		p Value	
		No	Yes		
		n	% (95 CI)	n	% (95 CI)
Sociodemographic data					
Sex (N=206)		N=141		N=65	
	Male	30	21.3 (14.2 to 28.4)	19	29.2 (17.4 to 41)
	Female	111	78.7 (71.6 to 85.8)	46	70.8 (58.9 to 82.6)
Age (N=206)		N=141		N=65	
	18–44	58	41.1 (32.6 to 49.6)	32	49.2 (36.3 to 62.1)
	45–64	83	58.9 (50.4 to 67.3)	33	50.8 (37.8 to 63.7)
Educational level (N=203)		N=139		N=64	
	No education received	12	8.6 (3.6 to 13.6)	1	1.6 (0 to 8.4)
	Primary studies	37	26.6 (18.9 to 34.3)	11	17.2 (7.2 to 27.2)
	Secondary studies	50	36.0 (27.6 to 44.3)	17	26.6 (15 to 38.2)
	Vocational training	19	13.7 (7.6 to 19.7)	17	26.6 (15 to 38.2)
	University studies	21	15.1 (8.8 to 21.4)	18	28.1 (16.3 to 39.9)
Pain					
Duration of pain (months) (N=205)	Mean (95% CI) (SD)	N=141	92.3 (76.2 to 108.3) (96.3)	N=64	113.8 (83.6 to 143.9) (120.7)
Number of pain sites (N=205)		N=140		N=65	
	1 location	81	57.9 (49.3 to 66.4)	36	55.4 (42.5 to 68.2)
	More than 1 location	59	42.1 (33.6 to 50.7)	29	44.6 (31.7 to 57.5)
The most affected pain site (N=205)		N=140		N=65	
	Widespread pain	19	13.6 (7.5 to 19.6)	15	23.1 (12.1 to 34.1)
	Head	20	14.3 (8.1 to 20.4)	2	3.1 (0.4 to 10.7)
	Neck (cervical vertebrae)	13	9.3 (4.1 to 14.4)	4	6.2 (1.7 to 15)
	Back	27	19.3 (12.4 to 26.2)	21	32.3 (20.2 to 44.4)
	Limbs and/or joints	50	35.7 (27.4 to 44)	17	26.2 (14.7 to 37.6)
	Chest	2	1.4 (0.2 to 5.1)	2	3.1 (0.4 to 10.7)
	Abdomen	6	4.3 (0.6 to 8)	2	3.1 (0.4 to 10.7)
	Other	3	2.1 (0.4 to 6.1)	2	3.1 (0.4 to 10.7)
Pain intensity (N=204)		N=140		N=64	
	Slight or very slight	8	5.7 (1.5 to 9.9)	3	4.7 (1 to 13.1)
	Moderate	73	52.1 (43.5 to 60.8)	21	32.8 (20.5 to 45.1)
	Severe	45	32.1 (24 to 40.2)	26	40.6 (27.8 to 53.4)
	Unbearable	14	10.0 (4.7 to 15.3)	14	21.9 (11 to 32.8)
Number of medical pain consultations the last year (N=193)	Mean (95% CI) (SD)	N=128	3.34 (2.7 to 4) (3.7)	N=65	4.32 (3.1 to 5.5) (5.0)
Currently taking pain medication (N=206)		N=141		N=65	
	No	53	37.6 (29.2 to 45.9)	14	21.5 (10.8 to 32.3)
	Yes	88	62.4 (54.1 to 70.8)	51	78.5 (67.7 to 89.2)

Continued

Table 2 Continued

Variables	Categories	Sick leave		p Value	
		No	Yes		
		n	% (95 CI)	n	% (95 CI)
Opinion on the care received (N=190)		N=128		N=62	0.149*
	Very unsatisfied	5	3.9 (1.3 to 8.9)	7	11.3 (2.6 to 20)
	Unsatisfied	15	11.7 (5.7 to 17.7)	6	9.7 (1.5 to 17.8)
	Neither satisfied nor dissatisfied	20	15.6 (8.9 to 22.3)	13	21.0 (10 to 31.9)
	Satisfied	62	48.4 (39.4 to 57.5)	21	33.9 (21.3 to 46.4)
	Very satisfied	26	20.3 (12.9 to 27.7)	15	24.2 (12.7 to 35.7)
Mood					
Sadness (N=206)		N=141		N=65	0.029*
	Not at all	49	34.8 (26.5 to 43)	12	18.5 (8.7 to 30)
	A little	23	16.3 (9.8 to 22.7)	12	18.5 (8.7 to 30)
	Some	35	24.8 (17.3 to 32.3)	16	24.6 (14.1 to 37.5)
	Quite a lot	24	17.0 (10.5 to 23.6)	12	18.5 (8.7 to 30)
	A lot	10	7.1 (2.5 to 11.7)	13	20.0 (10 to 31.9)
Anxiety and distress (N=205)		N=141		N=64	0.020*
	Not at all	51	36.2 (27.9 to 44.4)	12	18.8 (8.4 to 29.1)
	A little	26	18.4 (11.7 to 25.2)	12	18.8 (8.4 to 29.1)
	Some	27	19.1 (12.3 to 26)	14	21.9 (11 to 32.8)
	Quite a lot	26	18.4 (11.7 to 25.2)	12	18.8 (8.4 to 29.1)
	A lot	11	7.8 (3 to 12.6)	14	21.9 (11 to 32.8)
Family and social environment					
The individual considers that his/her pain affects his/her family (N=206)		N=141		N=65	0.056*
	Not at all	81	57.4 (49 to 66)	27	41.5 (28.8 to 54.3)
	A little	17	12.1 (6.3 to 17.8)	10	15.4 (5.8 to 24.9)
	Some	24	17.0 (10.5 to 23.6)	14	21.5 (10.8 to 32.3)
	Quite a lot	12	8.5 (3.5 to 13.5)	13	20.0 (9.5 to 30.5)
	A lot	7	5.0 (1 to 8.9)	1	1.5 (0 to 8.3)
Impact on relationships with friends (N=205)		N=140		N=65	0.202‡
	The relationship has been lost because of the pain	4	2.9 (0.8 to 7.1)	3	4.6 (0.9 to 12.9)
	The relationship has deteriorated	22	15.7 (9.3 to 22.1)	15	23.1 (12.1 to 34.1)
	Nothing has changed in the relationship	114	81.4 (14.6 to 88.2)	46	70.8 (59 to 82.6)
	The relationship has improved	0	0.0	1	1.5 (0 to 8.3)
Satisfaction with the support received from the family (N=206)		N=141		N=65	0.834‡
	Very unsatisfied	3	2.1 (0.4 to 6.1)	1	1.5 (0 to 8.3)
	Unsatisfied	4	2.8 (0.8 to 7.1)	3	4.6 (0.9 to 12.9)
	Neither satisfied nor dissatisfied	23	16.3 (9.8 to 22.8)	14	21.5 (10.8 to 32.3)
	Satisfied	61	43.3 (34.7 to 51.8)	27	41.5 (28.8 to 54.3)
	Very satisfied	50	35.5 (27.2 to 43.7)	20	30.8 (18.8 to 42.7)

*Pearson χ^2 test.

†Mann-Whitney U test.

‡Verisimilitude ratio.

oints, and 68.5% were taking pain relief medication. The mean duration of pain was ~9 years (SD 9.4; median 5 years: [table 1](#)) and about 70% of respondents with CP felt sad and/or anxious because of their pain, reporting that their pain affected activities such as bending down, kneeling down, squatting and sleeping ([figure 1](#)). In addition, 47.6% of those suffering CP considered that their pain affected their family environment and 22.2% reported that CP had affected the relationship with their friends. Moreover, 77% of the people were generally satisfied or very satisfied with the help received from their relatives ([table 1](#)).

Characteristics of the individuals who requested sick leave and related variables

It is noteworthy that 31.6% of those respondents suffering CP reported having been on sick leave in the last year because of their CP, representing a prevalence of 4.21% of the Spanish population (95% CI 3.2% to 5.2%). This prevalence was higher in women (2.98%; 95% CI 2.1% to 3.9%) than in men (1.23%; 95% CI 0.6% to 1.8%; $p=0.001$), and notably, participants with a higher educational level, those with severe or unbearable pain

(40.6%), and those with pain located principally in their back (32.3%) took sick leave more often ([table 2](#)). In addition, 78.5% of people who requested sick leave were taking pain relief medication, while 64.6% needed help in grooming and dressing ([figure 2](#)), and 81.5% felt sad and/or anxious because of their pain ([table 2](#)). The individuals who had taken sick leave did not appear to have experienced a deterioration in their relationship with friends, nor were they less satisfied with the level of support provided by the family, although they did perceive a greater effect of pain on their family.

The multivariate analysis of the variables associated to sick leave in the study population showed that those individuals who considered that their pain affected their families (OR=2.18, 95% CI 1.10 to 4.34), those who needed help in grooming or dressing (OR=2.98, 95% CI 1.49 to 5.98), those currently taking pain medication (OR=2.18, 95% CI 1.01 to 4.72) and those with a higher educational level, were more likely to take sick leave because of their pain. In contrast, a longer duration of CP was associated with the need for less sick leave among the individuals studied (OR=0.99, 95% CI 0.99 to 1.00; [table 3](#)).

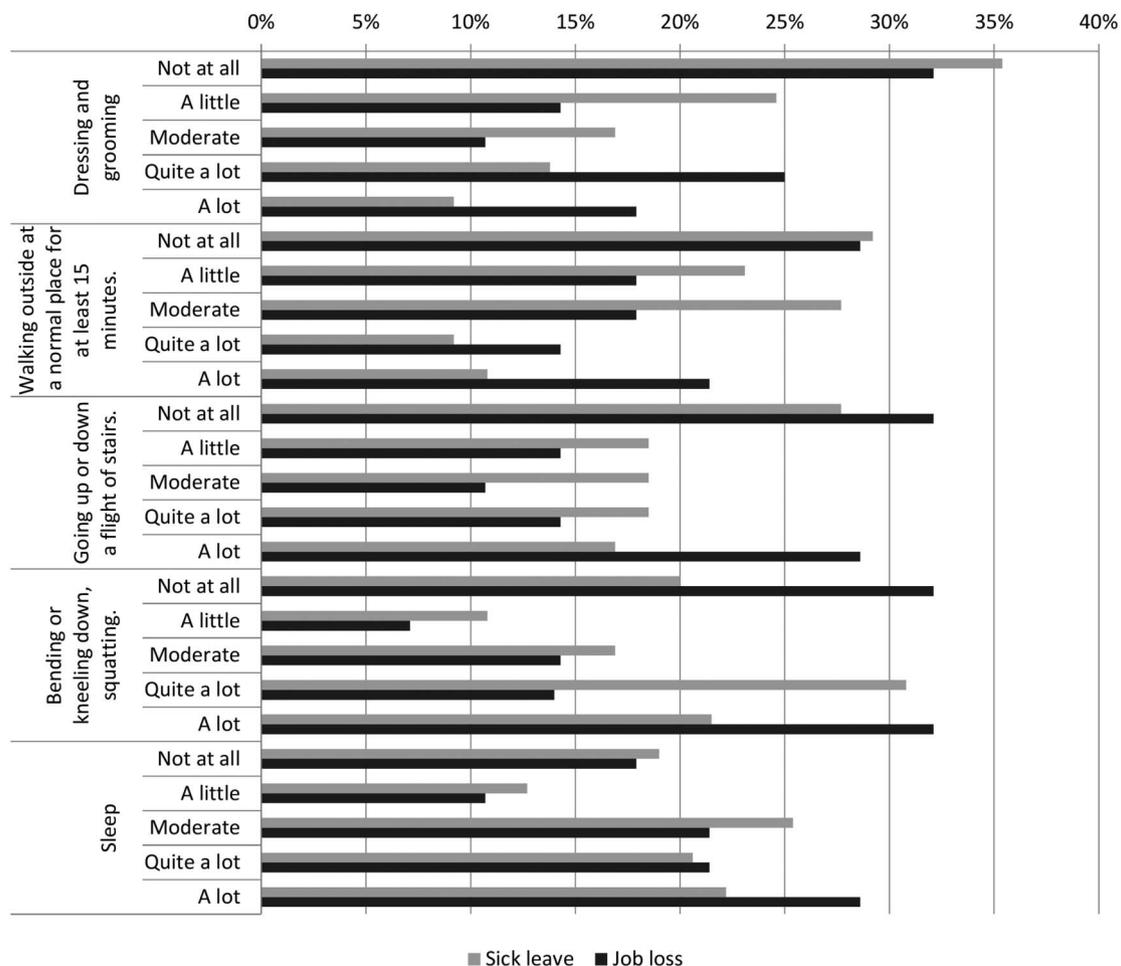


Figure 2 Association between daily life activities and requests for sick leave, and leaving or the loss of employment.

Table 3 Multivariate analysis of the factors related to sick leave

Sick leave (N=202)			
Variables	Wald statistic	OR (95% CI)	p Value
Educational level			
No education received*			
Primary studies	1.44	3.89 (0.42 to 35.74)	0.230
Secondary studies	1.94	4.74 (0.53 to 42.34)	0.164
Vocational training	5.61	14.71 (1.59 to 136.24)	0.018
University studies	6.13	16.70 (1.80 to 155.07)	0.013
The individual needs assistance in grooming and dressing because of their pain			
No*			0.002
Yes	9.50	2.98 (1.49 to 5.98)	
The individual considers that his/her pain affects his/her family			
No*			0.026
Yes	4.97	2.18 (1.10 to 4.34)	
Duration of pain (months)	4.16	0.99 (0.99 to 1.00)	0.041
The individual is currently taking pain relief medication			
No*			
Yes	3.96	2.18 (1.01 to 4.72)	0.047

*reference category.
Hosmer-Lemeshow $\chi^2=3.333$; $gl=2$; $p=0.975$.

Characteristics of the people who had left or lost their jobs and the related variables

Of the individuals suffering from CP, 13.5% reported having lost or left their jobs because of their pain, representing a prevalence of 1.81% of the Spanish population (95% CI 1.1 to 2.5). This prevalence was higher in women (1.23% vs 0.58%: $p=0.088$). Among these individuals, it was particularly notable that 42.9% rated their pain as unbearable, 67.9% needed help in grooming and dressing (figure 2) and more than half (57.7%) were dissatisfied with the care provided by the healthcare system. Likewise, a very high percentage of these people felt sad (89%) or anxious (85.7%) because of their pain, and 44.4% reported that the relationship with their friends had deteriorated, while 35.7% considered that their pain had an impact on their family. However, only 10.7% indicated that they were not satisfied with the help provided by the family (table 4).

In the multivariate analysis of the variables associated with the loss of employment, only those individuals with CP who felt sad because of their pain (OR=4.25, 95% CI 0.95 to 19.02), those who were not satisfied with the care provided by healthcare professionals (OR=2.60, 95% CI 6.25 to 1.08) and those who had consulted a doctor more often because of their pain (OR=1.09, 95% CI 1.00 to 1.19) were more likely to have lost or left their job (table 5).

DISCUSSION

This study analyses the relationship of CP with employment among the Spanish general population. Specifically, the prevalence of sick leave due to CP was assessed and in addition, the loss of employment due to CP was also evaluated. To the best of our knowledge, this is the first study to analyse how the family environment affects these two employment-related issues in individuals suffering from CP. The results obtained reveal that there is a significant relationship between CP and the individual's capacity to work, meaning that over 4% of the Spanish population in working age requested sick leave in the last year and that nearly 2% lost their jobs as a result of the CP suffered. It is also noteworthy that almost a third of the individuals suffering CP needed to take sick leave and that over 10% lost their jobs as a result of their CP. Although these figures are lower than those reported elsewhere,^{7 14 25 26} they are particular significant if we take into consideration the associated social and economic burden.^{10-12 27}

It is notable that among the factors associated with sick leave in the study, individuals whose CP produced greater physical limitations (incapable to groom themselves or get dressed without help), as well as those who perceived that CP was affecting their family environment, were the individuals at greater risk of requesting sick leave. Thus, the perception of the effect of pain on the family is associated with the individual's professional life. These results are consistent with other findings where the physical limitations experienced by patients produce greater reliance on care and assistance, which is mostly provided by the family.²⁸ As a consequence, these demands produce feelings of dependency and a reduced sense of autonomy and/or self-confidence,²⁹ which could affect an individual's performance in the workplace. However, this hypothesis should be tested more directly.

Our results are consistent with some previous analyses of the factors associated with absenteeism in individuals suffering CP,^{30 31} whereby those who take pain relief medication and that had a shorter duration of pain are likely to take more sick leave. In line with our results, employees who stay on sick leave due to neck or back pain appear to take higher doses of medication than other people.³² Moreover, it has been proposed that the longer pain is experienced, the better individuals can adapt to CP, reorganising their lives and learning to accept their pain, making them better able to perform their jobs.³⁰ However, pain intensity did not appear to be related to sick leave here, in contrast to an earlier report¹² but in accordance with another study in which fear avoidance, pain catastrophising and pain self-efficacy belief were other psychological variables associated with the ability to work.³³

It has been reported that at the same intensity of pain, how individuals deal with CP depends on their level of education.³⁴ Indeed, a lower educational level apparently predicts an increased risk of sick leave.³⁰ However,

Table 4 Bivariate analysis of the factors related to leaving or losing employment

Variables	Categories	Left or lost employment		p Value	
		No	Yes		
		n	% (95% CI)	n	% (95% CI)
Sociodemographic data					
Sex (N=207)		N=179		N=28	0.257*
	Male	40	22.3 (16.5 to 29.2)	9	32.1 (15.9 to 52.4)
	Female	139	77.7 (70.8 to 83.5)	19	67.9 (47.6 to 84.1)
Age (N=207)		N=179		N=28	0.735*
	18–44	77	43.0 (35.5 to 50.5)	13	46.4 (26.2 to 66.7)
	45–64	102	57.0 (49.5 to 64.5)	15	53.6 (33.3 to 73.8)
Educational level (N=204)		N=176		N=28	0.860*
	No education received	13	7.4 (3.2 to 11.5)	1	3.6 (0.1 to 18.3)
	Primary studies	41	23.3 (16.8 to 29.8)	7	25.0 (7.2 to 42.8)
	Secondary studies	59	33.5 (26.3 to 40.8)	8	28.6 (10.1 to 47.1)
	Vocational training	31	17.6 (11.7 to 23.5)	5	17.9 (6.1 to 36.9)
	University studies	32	18.2 (12.2 to 24.2)	7	25.0 (7.2 to 42.8)
Pain					
Duration of pain (months) (N=206)		N=179		N=27	0.989†
	Mean (95% CI) (SD)	106.89 (89.9 to 123.8)	(114.9)	105.04 (62.6 to 147.5)	(107.4)
Number of pain sites (N=206)		N=178		N=28	0.185*
	1 location	97	54.5 (46.9 to 62.1)	19	67.9 (48.8 to 86.9)
	More than 1 location	81	45.5 (37.9 to 53.1)	9	32.1 (13.1 to 51.2)
The most affected pain site (N=206)		N=178		N=28	0.249‡
	Widespread pain	29	16.3 (10.6 to 22.0)	5	17.9 (6.1 to 36.9)
	Head	23	12.9 (7.7 to 18.1)	1	3.6 (0.1 to 18.3)
	Neck (cervical vertebrae)	16	9.0 (4.5 to 13.5)	1	3.6 (0.1 to 18.3)
	Back	38	21.3 (15.0 to 27.6)	9	32.1 (13.1 to 51.2)
	Limbs and/or joints	61	34.3 (27.0 to 41.5)	7	25.0 (7.2 to 42.8)
	Chest	2	1.1 (0.1 to 4.0)	1	3.6 (0.1 to 18.3)
	Abdomen	5	2.8 (0.9 to 6.4)	3	10.7 (2.3 to 28.2)
	Other	4	2.2 (0.6 to 5.7)	1	3.6 (0.1 to 18.3)
Pain intensity (N=206)		N=178		N=28	
	Slight or very slight	9	5.1 (1.6 to 8.6)	2	7.1 (0.9 to 23.5)
	Moderate	90	50.6 (42.9 to 58.2)	3	10.7 (2.3 to 28.2)
	Severe	61	34.3 (27.0 to 41.5)	11	39.3 (19.4 to 59.2)
	Unbearable	18	10.1 (5.4 to 14.8)	12	42.9 (22.7 to 63.0)
Number of medical pain consultations last year (N=193)		N=166		N=27	0.400†
	Mean (95% CI) (SD)	3.36 (2.8 to 3.9)	(3.6)	5.30 (2.8 to 7.8)	(6.4)
Currently taking pain relief medication (N=207)		N=179		N=28	0.057*
	No	62	34.6 (27.4 to 41.9)	5	17.9 (6.1 to 36.9)
	Yes	117	65.4 (58.1 to 72.6)	23	82.1 (63.1 to 93.9)

Continued

Table 4 Continued

Variables	Categories	Left or lost employment				p Value
		No		Yes		
		n	% (95% CI)	n	% (95% CI)	
Opinion on the care received (N=190)		N=164		N=26		0.002‡
	Very unsatisfied	6	3.7 (0.5 to 6.8)	6	23.1 (9.0 to 43.6)	
	Unsatisfied	19	11.6 (6.4 to 16.8)	2	7.7 (0.9 to 25.1)	
	Neither satisfied nor dissatisfied	27	16.5 (10.5 to 22.4)	7	26.9 (8.0 to 45.9)	
	Satisfied	76	46.3 (38.4 to 54.3)	7	26.9 (8.0 to 45.9)	
	Very satisfied	36	22.0 (15.3 to 28.6)	4	15.4 (4.4 to 34.9)	
Mood						
Sadness (N=207)		N=179		N=28		<0.001‡
	Not at all	58	32.4 (25.3 to 39.5)	3	10.7 (2.3 to 28.2)	
	A little	31	17.3 (11.5 to 23.1)	3	10.7 (2.3 to 28.2)	
	Some	47	26.3 (19.5 to 33.0)	4	14.3 (4.0 to 32.7)	
	Quite a lot	29	16.2 (10.5 to 21.9)	8	28.6 (10.1 to 47.1)	
	A lot	14	7.8 (3.6 to 12.0)	10	35.7 (16.2 to 55.2)	
Anxiety and distress (N=206)		N=178		N=28		0.013*
	Not at all	59	33.1 (26.0 to 40.3)	4	14.3 (4.0 to 32.7)	
	A little	35	19.7 (13.5 to 25.8)	3	10.7 (2.3 to 28.2)	
	Some	36	20.2 (14.0 to 26.4)	5	17.9 (6.1 to 36.9)	
	Quite a lot	31	17.4 (11.6 to 23.3)	8	28.6 (10.1 to 47.1)	
	A lot	17	9.6 (5.0 to 14.1)	8	28.6 (10.1 to 47.1)	
Family and social environment						
The individual considers that his/her pain affects his/her family (N=206)		N=178		N=28		0.013‡
	Not at all	98	55.1 (47.5 to 62.6)	10	35.7 (16.2 to 55.2)	
	A little	25	14.0 (8.7 to 19.4)	2	7.1 (0.9 to 23.5)	
	Some	31	17.4 (11.6 to 23.3)	6	21.4 (8.3 to 41.0)	
	Quite a lot	17	9.6 (5.0 to 14.1)	9	32.1 (13.1 to 51.2)	
	A lot	7	3.9 (0.8 to 7.1)	1	3.6 (0.1 to 18.3)	
The impact of pain on their relationships with friends (N=206)		N=179		N=27		0.010‡
	The relationship has been lost because of the pain	4	2.2 (0.6 to 5.6)	3	11.1 (2.4 to 29.2)	
	The relationship has deteriorated	29	16.2 (10.5 to 21.9)	9	33.3 (13.7 to 53.0)	
	Nothing has changed in the relationship	145	81.0 (75.0 to 87.0)	15	55.6 (35.0 to 76.2)	
	The relationship has improved	1	0.6 (0.0 to 3.1)	0	0	
Satisfaction with the support received from the family (N=207)		N=179		N=28		0.206*
	Very unsatisfied	4	2.2 (0.6 to 5.6)	0	0	
	Unsatisfied	4	2.2 (0.6 to 5.6)	3	10.7 (2.3 to 28.2)	
	Neither satisfied nor dissatisfied	32	17.9 (12.0 to 23.8)	6	21.4 (8.3 to 41.0)	
	Satisfied	74	41.3 (33.8 to 48.8)	12	42.9 (22.7 to 63.0)	
	Very satisfied	65	36.3 (29.0 to 43.6)	7	25.0 (7.2 to 42.8)	

*Pearson χ^2 test.

†U de Mann-Whitney.

‡Verisimilitude ratio.

Table 5 Multivariate analysis of the factors related to leaving or losing employment

Left or lost employment (N=189)			
Variables	Wald Statistics	OR (95% CI)	p Value
Sadness due to their pain			
No*			0.059
Yes	3.57	4.25 (0.95 to 19.02)	
Opinion on the care received			
Unsatisfied*			0.032
Satisfied	4.57	2.60 (6.25 to 1.08)	
Number of medical consultations	4.11	1.09 (1.00 to 1.19)	0.043

*reference category.

Hosmer-Lemeshow $\chi^2=3.333$; gl=8; p=0.912.

this relationship was inverted in our study and the individuals who requested more sick leave were those with a higher educational level. One possible explanation for this is that employees with a lower education level and worse qualifications felt more insecure and were more afraid of losing their jobs. As such, they tend to remain at work even though their health is not optimal.³⁵

Regarding the second issue analysed in this study, it is noteworthy that negative mood was associated with job loss. This result is consistent with data from other studies where patients who suffer from CP and experience a mood disorder were those who reported more physical limitations.³⁶ In addition, these patients were three times more likely to be absent from their jobs³⁷ and to be less productive³⁸ than those without such disorders. Moreover, the number of medical consultations increases when CP and depression coexist.^{39, 40} In the present study, the individuals with most medical consultations were at greater risk of having lost their jobs, which may be explained by the high percentage of people who felt sad because of the pain.

Dissatisfaction with the care received also had a direct effect on job loss in CP sufferers. This relationship has not been described previously and it could be explained by the hypothesis that individuals who suffer from mood disorders are less capable of positively valuing their environment, including their healthcare. Accordingly, these individuals are more likely to be dissatisfied with the medical attention they receive and they will therefore use more healthcare resources to resolve their problems.⁴¹ This finding underlines the importance of appraising and properly treating the psychological domain in people with CP, which as well as helping to improve their therapeutic response could also produce greater satisfaction and less use of the healthcare resources, also dampening the negative impact on their jobs. However, further studies will be necessary to better understand of this association.

Some limitations of the present study must be taken into account. First, a suitable sample size was not

determined in advance as the study is a post hoc analysis of data collected previously, which may reduce the precision of the specific parameters evaluated. Another limitation is that the information was gathered via telephone interviews with an established maximum duration of ~20 min to prevent the loss of responders. This limits the complexity of the questionnaire and as such, no information was included regarding the individual's workload or aspects related to presenteeism, nor on the type of drugs taken as pain relief medication. The survey used was not validated, but the items included in the questionnaire were taken from other surveys carried out by the 'Instituto Nacional de Estadística' (National Statistics Institute) in Spain, which follow adequate quality control procedures. No specific scales were used to assess sadness and anxiety as the nature of telephone interviews makes it difficult to implement such instruments. Some authors have argued that the use of telephone interviews is more suitable for population-based studies than for face-to-face surveys, since they permit greater coverage, and that more representative samples are obtained by selecting telephone numbers at random. Finally, it must be borne in mind that this is a cross-sectional study and thus, the relationships observed do not allow us to establish a causal relationship.

In conclusion, despite the limitations cited above, the results of this study highlight the strong impact of CP on employment in the Spanish population. In addition, the results also provide new insights into other issues that have not been analysed previously, such as the effect that the perceived impact of pain on the family has on the individual's performance at work.

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