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Psychiatric Disorders and Association with Quality of Sleep and Quality of Life in Patients with Chronic Pain: A SCID-Based Study

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Abstract

Objective. We aimed to determine Axis-I psychiatric disorders in patients with chronic pain (CP) and compare control subjects determined by a structured clinical interview. Another objective of the study was to examine whether there is an association between psychiatric disorders and quality of sleep, quality of life, and demographic and clinical characteristics in patients with CP.

Design. The study sample was comprised of 108 patients with CP and 54 control subjects without pain. Psychiatric interviews were conducted with the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV (SCID). Also used were the Hospital Anxiety and Depression Scale, Hamilton Depression Inventory, Short Form-36, and Pittsburgh Sleep Quality Index (PSQI).

Results. The rate of any Axis-I psychiatric disorder stood at 66.7% (any mood disorder, 50%; any anxiety disorder, 33.3%; any somatoform disorder, 20.4%; any substance use disorder, 16.6%), significantly more common in the patients' group compared with the control group. The most common psychiatric disorder was major depression (49.1%) in subjects with CP. Female gender, numbers of localization, and neck and back localizations were significantly higher in the SCID (+) group than the SCID (–) group. A statistically significant difference was observed between the SCID (+) and SCID (–) groups regarding visual analogue scale, depression and anxiety scores, mental component summary score, and global PSQI scores.

Conclusion. Results of this study suggest that psychiatric morbidity in patients with CP is frequently seen and may adversely affect quality of sleep and quality of life of the patients. Therefore, the patients with CP should be examined with respect to their mental status.

Key Words. Anxiety; Chronic Pain; Depression; Psychiatric Comorbidity; Quality of Life; Quality of Sleep

Introduction

Chronic pain (CP) is a common medical condition for which patients seek care from various health care providers [1]. CP is defined as pain that persists for longer than the expected time frame for healing or pain associated with progressive, nonmalignant disease. Population-based studies reported that 25% have chronic or recurrent pain [2]. The prevalence of CP conditions is expected to increase with age and will pose a major health problem [3]. This type of pain causes much suffering and disability and is frequently mistreated or undertreated; thus, many patients with CP need a careful assessment for diagnosis and therapy [4].

Patients with CP commonly experience depression, anxiety, sleep disturbance, fatigue, and decreased overall physical and mental functioning. Psychiatric comorbidity is

high among these patients [5]. Many studies have evaluated the relationship between CP and psychiatric disturbances; however, most of them evaluated psychiatric symptoms based on self-report measures and had many limitations [6–8]. CP is associated with several symptoms that are components of the diagnostic criteria for a major depressive disorder (MDD). Compared with healthy individuals, individuals with CP report more fatigue, loss of energy, and sleep disturbance. According to a few studies based on structured clinical interviews, 62.9–75% of patients with CP have at least one psychiatric disorder [9,10]. These studies suggest that, in patients with CP, the most common psychiatric diagnoses are MDD, somatoform disorders (SDs), and generalized anxiety disorder (GAD). Knaster et al. showed that both depression and anxiety were associated with pain intensity [9].

As the literature emphasizes, severe pain is the most common cause of poor sleep [11]. Marin et al. reported that sleep disturbance is an extremely common finding in patients with chronic lower back pain [12]. Raymond et al. demonstrated that a direct relationship between the intensity of pain and the degree of sleep disturbance is particularly manifested by a decrease in sleep quality [13]. Sleep disorders can also result in fatigue, depression, loss of concentration, increased anxiety, irritability, pain sensitivity, loss of appetite, and lack of daytime alertness. Sleep disturbance is a symptom that depression and CP share. In depression and CP, a common pathophysiology of serotonin deficiency influences sleep [14]. Moreover, the link between sleep problems and psychological distress may be mediated to increased health-related anxiety [15]. Sleep disturbance is a common risk factor associated with increased health care utilization and decreased quality of life in the patients with CP [16].

There are limited data about the effect of Axis-I psychiatric disorders in patients with CP despite their frequent existence. There are also an inadequate number of studies based on a structured clinical interview. Most studies do not compare CP patients with healthy controls in terms of psychiatric diagnoses. Additionally, to our knowledge, some researchers have studied patients with specific pain localization, but no published study examines the association between psychiatric disorders and pain localization. Furthermore, some studies have explored quality of sleep and quality of life, but no published study analyzes predictors of these factors. Consequently, we aimed to determine Axis-I psychiatric disorders in patients with CP and to compare healthy control subjects. Another objective of the study was to compare quality of sleep, quality of life, depression levels, and pain intensity of CP patients with and without Axis-I psychiatric disorders.

Materials and Methods

Setting and Sample

This study was conducted among CP patients admitted to the Pain Outpatient Clinic at the Faculty of Medicine of Selçuk University between May 2011 and April 2012. The study was approved by the Selçuk University Medical Faculty's Ethics Committee. The study's objectives and procedures were explained and written informed consent given in accordance with the Declaration of Helsinki.

The criteria for inclusion were an age of 18–65 years and duration of pain at least 6 months. The exclusion criteria were cognitive incompetence, which can make a psychiatric interview difficult; a history of schizophrenia or related psychotic disorders; a history of neurological disease (e.g., cerebrovascular disease, movement disorder, seizure, polyneuropathy, and cranial neuropathy); and concomitant serious medical illnesses like uncontrolled endocrine abnormalities, cardiovascular or pulmonary disease, rheumatic diseases, and any cancer.

Initially, 187 patients with CP were screened in the pain clinic. Patients who did not meet the study's criteria (N = 67) and did not want to participate (N = 12) were excluded, leaving 108 consecutive patients in the study. The patients' groups were comprised of those admitted for the first time and/or a routine follow-up visit for CP. The study sample also included a control group of 54 hospital personnel and relatives matched for the sociodemographic characteristics of CP patients.

Through interviews and chart reviews, we collected comprehensive demographic information, including age, sex, educational level, socioeconomic status, and marital status. A monthly income of $US500 was designated low economic status. A monthly income of $US500–1,500 was considered medium financial status, and a monthly income above $US1,500 signified good economic status. After recording the participants' sociodemographic characteristics and pain localizations in the pain clinic, patients were referred to the psychiatry department. Psychiatric interviews were conducted using the Structured Clinical Interview for DSM-IV (SCID-I) [17,18]. A psychiatrist performed the psychiatric diagnoses. All of the psychiatric interviews were conducted by one psychiatrist with at least 4 years of experience (Dr. B.B.A.). The severity of anxiety and depressive symptoms was assessed using the Hospital Anxiety and Depression Scale (HADS) and Hamilton Depression Inventory. Quality of life was assessed with the Short Form-36 (SF-36), and sleep quality was assessed with the Pittsburgh Sleep Quality Index (PSQI).

Measures

Visual Analogue Scale

Pain intensity was assessed with the visual analogue scale (VAS), a 100-mm horizontal line with the 0-mm end representing no pain and the 100-mm end representing pain as severe as you can imagine.

HADS

The HADS is a self-administered questionnaire that measures anxiety and depressive symptoms [19]. The HADS is

divided into an anxiety subscale (HAD-A) and a depressive symptoms subscale (HAD-D), both containing seven intermingled items. Aydemir et al. [20]. validated the Turkish version of this study's HADS. Aydemir et al. suggested a cutoff value of the anxiety subscale as 10/11 and the depressive symptoms subscale as 7/8. Accordingly, participants with those or higher scores are considered at risk. The lowest score for both subscales is 0, and the highest score is 21.

Hamilton Depression Scale

The psychiatrist assessed levels of depression utilizing the 17 items Hamilton Depression Scale (Hamilton-D) [21]. The Turkish version of the Hamilton-D has been demonstrated to be valid and reliable in the Turkish population [22].

Quality of Life

Quality of life was measured with the 36 questions SF-36. The SF-36 is a self-administered questionnaire that yields the following: scores for eight domains of life (physical functioning, role limitations [physical, bodily pain, general health perceptions, vitality, social functioning], emotional, and mental health); two summary scores; a mental component summary score (MCS); and a physical component summary score (PCS). Each of the eight domains is scored on a scale of 100, with higher scores indicating better functioning. The MCS and PCS scores are standardized to a mean (standard deviation) of 50, with scores below 50 indicating low average functioning [23]. SF-36 was translated into Turkish, and validation studies of the Turkish version of SF-36 were carried out in patient groups in 1999 [24].

Quality of Sleep

Sleep quality was measured using the PSQI [25]. This self-administered questionnaire assesses sleep quality during the previous month and contains 19 self-rated questions yielding seven components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. Each component is scored from 0 to 3, yielding a global PSQI score between 0 and 21, with higher scores indicating lower sleep quality. The PSQI is useful in identifying good and poor sleepers. A global PSQI score >5 indicates a person is a poor sleeper, having severe difficulties in at least two areas or moderate difficulties in more than three areas. The Turkish version of the PSQI has been demonstrated to be valid and reliable in the Turkish population [26].

Statistical Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 13.0 (SPSS Inc., Chicago, IL, USA) for Windows. All variables were tested with the Kolmogorov–Smirnov test to determine whether their distributions were normal. For comparisons within the study group, the *t*-test or Mann–Whitney *U*-test (when the data were not normally distributed) was used for continuous variables, and the χ^2 test or Fisher's exact test was used for categorical variables. Multivariate linear regression analysis was performed, and independent predictors of the PCS, MCS, and global PSQI scores were determined. All *P* values were two-tailed, and the statistical significance was set as $P < 0.05$.

Results

The mean age of the patients (N = 108) was 47.7 ± 11.7 years (26–72 years). The patients were mostly female (N = 76, 70.4%), married (N = 94, 87%), unemployed (N = 81, 75%), and primary school graduates (N = 77, 71%). There was no significant difference between the patients and control groups regarding sociodemographic characteristics (Table 1).

Table 2 shows the current prevalence rate of mood, anxiety, somatoform, and substance use disorders in patients with CP and the control subjects. Seventy-two (66.7%) subjects with CP met the criteria of at least one psychiatric disorder according to SCID-I. Among the patients, the current prevalence of any mood disorder, any anxiety disorder, any SD, and any substance use disorder was 50%, 33.3%, 20.4%, and 16.6%, respectively. Specifically, the most common psychiatric disorder was major depression (N = 53, 49.1%). MDD, GAD, panic disorder (PD), somatization disorder, and analgesic prescription abuse were also significantly more prevalent in the patient group compared with the control group. We found no significant difference between the groups respecting prevalence of dysthymic disorder, social phobia, agoraphobia, obsessive–compulsive disorder, post-traumatic stress disorder (PTSD), pain disorder, and conversion disorder. None of the participants had a diagnosis of bipolar disorder, cyclothymia, social phobia, hypochondriasis, body dysmorphic disorder, or alcohol and other substance use (Table 2).

The sociodemographic and clinical characteristics of the CP patients with and without any Axis-I psychiatric disorders are presented in Table 3. There was no statistically significant difference between SCID (+) patients and SCID (–) patients regarding age, marital status, education level, employment, or economic status. Female gender was higher in the SCID (+) group than the SCID (–) group. There was no statistically significant difference between the types of pain. Neck and back localizations were higher in the SCID (+) group than the SCID (–) group. There were eight pain localizations and two types of pain. Considering these 10 items as a related set, the standard Bonferroni correction for multiple comparisons would require $P \leq 0.005$ to count any of them as significant. None of the results in the set attain that value (the smallest *P* values are 0.025 and 0.020 for neck and back, respectively).

The mean hospital anxiety and depression subscales (HAD-A and HAD-D) and mean Hamilton-D scores were above the cutoff score in the SCID (+) group. The number

Table 1 Sociodemographic characteristics of the study sample

	Patients Group (N = 108)	Control Group (N = 54)	*P*
Age, mean ± SD, years[†]	47.8 ± 11.7	45.3 ± 10.8	0.180
Gender, N (%)[‡]			0.259
Female	76 (70.4)	43 (79.6)	
Marital status, N (%)[‡]			0.806
Married	94 (87)	48 (88.9)	
Education, N (%)[§]			0.389
Elementary	77 (71.3)	41 (75.9)	
High School	15 (13.9)	8 (14.8)	
University	16 (14.8)	5 (9.3)	
Employment status, N (%)[‡]			0.429
Unemployed	81 (75)	44 (81.5)	
Economic status, N (%)[§]			0.108
Low economic	28 (25.9)	10 (18.5)	
Medium economic	78 (72.2)	40 (74.1)	
Good economic	2 (1.9)	4 (7.4)	

[†] *t* test; [‡] Fisher's Exact Test; [§] χ^2 Test.
SD = standard deviation.

Table 2 Comparison of current psychiatric diagnoses (assessed with SCID) between patients with chronic pain and control group

Diagnoses	Patients group (N = 108) N (%)	Control group (N = 54) N (%)	*P*[†]
Mood disorders	54 (50)	4 (7.4)	<0.001
Major depression	53 (49.1)	3 (5.6)	<0.001
Bipolar disorder	0 (0)	0 (0)	—
Dysthymia	5 (4.6)	1 (1.9)	0.665
Cyclotymia	0 (0)	0 (0)	—
Anxiety disorders	36 (33.3)	5 (9.3)	0.001
Generalized anxiety disorder	23 (21.3)	2 (3.7)	0.003
Social phobia	0 (0)	1 (1.9)	0.333
Panic disorder	9 (8.3)	0 (0)	0.030
Agoraphobia	4 (3.7)	1 (1.9)	0.666
Obsessive—compulsive Disorder	2 (1.9)	1 (1.9)	1.00
Post-traumatic stress disorder	1 (0.9)	0 (0)	1.00
Somatoform disorders	22 (20.4)	0 (0)	<0.001
Somatization disorder	19 (17.6)	0 (0)	<0.001
Pain disorder	3 (2.8)	0 (0)	0.551
Hypochondriasis	0(0)	0 (0)	—
Conversion disorder	1 (0.9)	0 (0)	1.00
Body dysmorphic disorder	0 (0)	0 (0)	—
Substance use disorders	18 (16.6)	0 (0)	<0.001
Alcohol abuse	0 (0)	0 (0)	—
Alcohol dependence	0 (0)	0 (0)	—
Analgesic prescription abuse	18 (16.6)	0 (0)	<0.001
Sedative-hypnotic abuse	0 (0)	0 (0)	—
Eating disorders	0 (0)	0 (0)	—
Any SCID diagnosis	72 (66.7)	8 (14.8)	<0.001

[†] Fisher's Exact Test.
SCID = Structured Clinical Interview for DSM-IV.

Table 3 Demographic and clinical features of SCID (+) groups and SCID (–) groups

	SCID (+) group (N = 72)	SCID (–) group (N = 36)	*P*
Age (mean years ± SD)†	46.7 ± 12.3	50.1 ± 10.1	0.153
Gender (N %)‡			0.025
Female (%)	56 (77.8)	20 (55.6)	
Male (%)	16 (22.2)	16 (44.4)	
Marital status (N %)‡			0.770
Married (%)	62 (86.1)	32 (88.9)	
Single (%)	10 (13.9)	4 (11.1)	
Education (N %)§			0.836
Elementary school (%)	52 (72.2)	25 (69.4)	
High school (%)	9 (12.5)	6 (16.7)	
University (%)	11 (15.3)	5 (13.9)	
Employment status (N %)‡			0.356
Employed (%)	16 (22.2)	11 (30.6)	
Unemployed (%)	56 (77.8)	25 (69.4)	
Economic status (N %)§			0.065
Low economic (%)	23 (31.9)	5 (13.9)	
Medium economic (%)	47 (65.3)	31 (86.1)	
Good economic (%)	2 (2.8)	0 (0)	
Pain localizations (N %)‡			
Face (%)	14 (19.4)	3 (8.3)	0.168
Head (%)	40 (55.6)	11 (30.6)	0.160
Neck (%)	43 (59.7)	13 (36.1)	0.025
Back (%)	23 (31.9)	4 (11.1)	0.020
Shoulder (%)	37 (51.4)	15 (41.7)	0.415
Low back (%)	48 (66.1)	20 (55.6)	0.295
Pelvic (%)	32 (44.4)	11 (30.6)	0.212
Knee (%)	36 (50)	12 (33.3)	0.150
Type of pain (N %)‡			
Neuropathic (%)	19 (26.4)	8 (22.2)	0.814
Myofascial (%)	31 (43.19	9 (25)	0.910

† Independent-samples *t* test; ‡ Fisher's Exact Test; § χ^2 test.
SCID = Structured Clinical Interview for DSM-IV; SD = standard deviation.

of localizations was higher in the SCID (+) group than the SCID (–) group. The SCID (+) group showed significantly worse scores on the VAS, depression and anxiety, and Global PSQI scores. The both groups had low scores (<50) on the PCS and MCS. Despite mean MCS scores showing a statistically significant difference between the two groups, there was no statistically significant difference between them regarding their PCS scores (Table 4).

Predictors of Global Sleep Score (PSQI)

When we performed a linear regression analysis in patients with CP, independent predictors of global PSQI were any SCID diagnosis ($\beta = 0.389$, $P < 0.001$), VAS ($\beta = 0.238$, $P = 0.04$), HAD-A ($\beta = 0.257$, $P = 0.007$), HAD-D ($\beta = 0.414$, $P < 0.001$), and Hamilton-D ($\beta = 0.306$, $P = 0.001$). However, age, gender, employment status, and numbers of localization cannot be accepted as independent factors associated with global PSQI ($\beta = –0.036$, $P = 0.713$; $\beta = –0.116$, $P = 0.232$; $\beta = –0.160$, $P = 0.098$; and $\beta = 0.115$, $P = 0.237$, respectively).

Predictors of PCS and MCS

When we performed linear regression analysis in patients with CP, the independent predictor of PCS was VAS ($\beta = –0.243$, $P = 0.008$). However, age, gender, employment status, numbers of localization, any SCID diagnosis, HAD-A, HAD-D, and Hamilton-D cannot be accepted as independent factors associated with PCS ($\beta = –0.177$, $P = 0.077$; $\beta = 0.008$, $P = 0.934$; $\beta = 0.192$, $P = 0.056$; $\beta = –0.104$, $P = 0.284$; $\beta = –0.103$, $P = 0.291$; $\beta = –0.040$, $P = 0.683$; $\beta = –0.097$, $P = 0.318$; and $\beta = –0.140$, $P = 0.149$, respectively).

When we performed linear regression analysis in patients with CP, independent predictors of MCS were any SCID diagnosis ($\beta = –0.237$, $P = 0.014$) and HAD-A ($\beta = –0.252$, $P = 0.008$). However, age, gender, employment status, numbers of localization, VAS, HAD-D, and Hamilton-D cannot be accepted as independent factors associated with MCS ($\beta = 0.073$, $P = 0.454$; $\beta = 0.012$, $P = 0.899$; $\beta = –0.020$, $P = 0.838$; $\beta = –0.007$, $P = 0.942$;

Table 4 Pain, depression, anxiety, quality of life, and quality of sleep scores of SCID (+) groups and SCID (–) groups

	SCID (+) group (N = 72) (Mean ± SD)	SCID (–) group (N = 36) (Mean ± SD)	Z/*t*	*P*
VAS score†	81.1 ± 18.5	71.9 ± 21	–2.192	0.028
HADS-D‡	12.0 ± 3.3	6.4 ± 4.0	7.60	<0.001
HADS-A‡	12.5 ± 3.9	6.3 ± 4.2	7.58	<0.001
Hamilton-D‡	16.6 ± 5.8	5.4 ± 2.9	13.15	<0.001
Number of localizations‡	3.77 ± 1.92	2.50 ± 1.79	–3.326	0.001
Quality of life				
PCS‡	32.3 ± 6.9	33.9 ± 9	–0.97	0.291
MCS†	33.9 ± 27.5	45.7 ± 9.2	–6.37	<0.001
Physical functioning‡	42.0 ± 25.4	52.5 ± 24.5	–2.05	0.043
Role-physical†	15.8 ± 29.4	37.7 ± 37.1	–3.37	0.001
Bodily pain†	26.0 ± 13.7	31.5 ± 15.8	–1.99	0.046
General health‡	31.3 ± 14.3	46.7 ± 14.4	–5.21	<0.001
Vitality‡	28.6 ± 16.3	52.6 ± 21.3	–6.48	<0.001
Social functioning‡	41.0 ± 24.2	55.8 ± 22.9	–3.05	0.003
Role-emotional†	16.0 ± 28.4	55.0 ± 36.9	–5.36	<0.001
Mental health‡	35.8 ± 16.9	60.2 ± 15.9	–7.18	<0.001
Quality of sleep				
Global PSQI‡	10.6 ± 3.6	7.5 ± 3.4	4.43	<0.001
Subjective sleep quality†	1.86 ± 0.75	1.27 ± 0.70	–3.87	<0.001
Sleep latency†	1.83 ± 0.93	1.30 ± 0.92	–2.75	0.006
Sleep duration†	1.65 ± 0.75	1.55 ± 0.69	–0.69	0.487
Sleep efficiency†	1.0 ± 1.07	0.58 ± 0.99	–2.31	0.021
Sleep disturbance†	1.98 ± 0.63	1.55 ± 0.60	–3.24	0.001
Use of sleep medications†	0.91 ± 1.17	0.27 ± 0.74	–2.85	0.004
Daytime dysfunction†	1.37 ± 0.94	0.94 ± 0.75	–2.35	0.018

† Mann–Whitney *U*-test (*Z*); ‡ independent-samples *t*-test (*t*).
VAS (0–100: The higher scores indicate that the pain is severe); HADS-D (a cutoff value of the depressive symptoms subscale as >7. The higher scores are considered at risk for depression); HADS-A (a cutoff value of the anxiety subscale as >10. The higher scores are considered at risk for anxiety); Hamilton-D (a cutoff value of the depression as >7); MCS (higher scores indicating better functioning. The MCS and PCS scores are standardized to a mean [SD] of 50, with scores below 50 indicating low average functioning); PSQI (0–21: The higher scores indicating lower sleep quality. Global PSQI score >5 indicates a person is a poor sleeper).
HADS-A = hospital anxiety and depression scale-anxiety subscale; HADS-D = hospital anxiety and depression scale- depression subscale; Hamilton-D = Hamilton depression scale; MCS = mental component summary score; PCS = physical component summary score; PSQI = Pittsburgh sleep quality index; SCID = Structured Clinical Interview for DSM-IV; SD = standard deviation; VAS = visual analog scale.

$\beta = -0.091$, $P = 0.349$; $\beta = -0.163$, $P = 0.093$; and $\beta = -0.78$, $P = 0.487$, respectively).

Predictors of the PCS, MCS, and global PSQI in patients with CP are presented in Table 5.

Discussion

In our sample, any psychiatric disorder was determined in 66.7% of CP patients, but the rate was only 14.8% in the control subjects. The most prevalent disorders were MDD (49.1%), GAD (21.3%), PD (8.3%), somatization disorder (17.6%), and analgesic prescription abuse (16.6%). The prevalence rates are higher than in the general population [27,28]. The published literature presents no studies comparing any psychiatric disorder between patients with CP and control groups. Several studies including different interview methods suggest that 59–75% of patients with CP have concurrently at least one psychiatric disorder, which is consistent with our findings [5,9,10,29].

Using the SCID, Knaster et al. found the lifetime prevalence rates in CP patients of any psychiatric disorder to be 75%; any mood disorder, 59%; MDD, 54%; dysthymic disorder, 11%; and bipolar disorder, 2%, all of which are similar to the rates we observed in the present study [9]. Although they reported a prevalence rate of any anxiety disorder similar to our study, their subtype of anxiety

Table 5 Predictors of the PCS, MCS, and global PSQI in patients with CP

	Predictors	*B*	*P*
PCS	VAS	−0.243	0.008
MCS	Any SCID diagnosis	−0.237	0.014
	HADS-A	−0.252	0.008
Global PSQI	Any SCID diagnosis	0.389	<0.001
	VAS	0.238	0.04
	HADS-A	0.257	0.007
	HADS-D	0.414	<0.001
	Hamilton-D	0.306	0.001

β linear regression analysis.
HADS-A = hospital anxiety and depression scale-anxiety subscale; HADS-D = hospital anxiety and depression scale-depression subscale; Hamilton-D = Hamilton depression scale; MCS = mental component summary score; PCS = physical component summary score; PSQI = Pittsburgh sleep quality index; SCID = Structured Clinical Interview for DSM-IV; VAS = visual analog scale.

disorder differs from our findings. They reported a higher prevalence rate of PTSD compared with the present study (12%). Nevertheless, GAD was the most common anxiety disorder in our subjects. Furthermore, Knaster et al. reported no SD. In a similar study, Ho et al. reported a prevalence of psychiatric disorders, 62.9%, in CP patients [10]. They revealed a current MDD was present in 31.5%; SDs occurred in 33.7%. This discrepancy could be due to the significant difference of the prevalence rate of pain disorder between these studies (28.1% vs 2.8%). Furthermore, they reported that in most current substance abuse disorders, 18% of them were sedative-hypnotic dependent. We found a prevalence of current substance abuse disorders, 16.6%, all analgesic prescription abuse. The reason behind this difference may be because benzodiazepines can be prescribed only controlled in Turkey. Therefore, we found no sedative-hypnotic dependence; however, in our subjects, analgesic prescription abuse was higher than a previous study [10]. CP conditions and prescription drug abuse are becoming important public health issues [2]. Many primary care providers have little specific training in pain medicine and addiction and are unsure how to safely prescribe opioids [30]. Moreover, the high prevalence of psychiatric comorbidity in those who misuse or abuse prescription drugs contributes to the complexity of treating pain [31].

Major depression was the most prevalent Axis-I disorder, with a rate of 49.1% in patients with CP. This association is indicated in all previous studies [8–10,29]. Depression among CP patients also seems more common than among other chronic illness populations [32]. Persistent pain is more likely to lead to depression than vice versa, and patients with more severe, frequent, and enduring pain are at risk for more severe depression [33]. Converging evidence suggests four key neurotransmitters are involved in both pain and depression. The most thoroughly studied of these neurotransmitters is serotonin. Serotonin can have pronociceptive or antinociceptive effects, depending on receptor subtype and the region of the central nervous system where binding occurs [30,31]. The second most thoroughly studied of neurotransmitters is norepinephrine. Like serotonin, norepinephrine might be pronociceptive in the periphery but typically acts in an antinociceptive fashion centrally [34,35]. Substance P and corticotrophin-releasing factor are also important factors in pain and depression
[36–38].

One of this study's findings was that GAD and PD occur more frequently than other anxiety disorders in patients with CP. Although there are some differences, previous studies have shown similar findings [9,10]. Among patients with CP, pain-related fear and pain catastrophizing have been associated with pain intensity, distress, and functional disability [39]. GAD is one of the most frequent mental disorders in both primary care and pain clinics. It is also underdiagnosed and poorly treated because patients usually initially report somatic symptoms [40]. Additionally, GAD and PD share common physical features with pain, like muscle tension and autonomic arousal symptoms. Patients with PD or GAD are more sensitive to bodily changes [41]. Treating common symptoms efficiently may positively affect both conditions simultaneously.

Somatization has often been viewed as a defense against emotional distress or as a masked depression. In a population-based survey study, Simon et al. suggested study respondents with high levels of somatization symptoms typically reported overt psychological distress, especially anxiety and depression [42]. Most depressed patients complain about physical symptoms first to general practitioners. We also found the somatization disorder was the third most frequent psychiatric disorder in our study sample. Ho et al. reported that pain disorder was the most common SD in patients with CP [10]. We only found a 2.8% pain disorder, like the healthy controls. This may have resulted from underlying differences among communities where the studies were conducted.

Another objective of the study was to examine whether any difference exists between CP patients with and without psychiatric disorders regarding demographic or clinical features. There was no statistically significant difference between SCID (+) patients and SCID (–) patients regarding age, marital status, education level, employment, or economic status. We found that psychiatric disorders were more common in women with CP. Although some researchers have focused on patients with specific pain localization, to our knowledge, our study is the first investigating the association between psychiatric disorders and pain localization [7,8,29]. We discovered that CP patients with psychiatric disorders were more likely

to experience neck and back pain. Furthermore, the associations between psychiatric morbidities and the number of localizations were significant. Clinicians should be more careful regarding psychiatric morbidity in patients with CP more than one pain site, though these findings must be confirmed in future studies. As expected, we observed that the VAS and depression and anxiety, global PSQI, and MCS scores were higher in patients with psychiatric disorders than in patients without them. Deterioration in sleep and life quality often accompanies the painful conditions associated with psychiatric disorders [6–8]. Furthermore, when we performed linear regression analysis in patients with CP, the independent predictors of global PSQI were any SCID diagnosis, the VAS, and anxiety and depression scores. These findings show that, if patients with CP have any, more severe psychiatric disorder, sleep quality is damaged. Therefore, patients may need to take additional medications for insomnia. When we performed a linear regression analysis in patients with CP, the independent predictor of PCS was the VAS. We can state the intensity of pain is the most important physical factor for physical components of quality of life in patients with CP. Independent predictors of MCS were any SCID diagnosis and the anxiety score. This study revealed that psychiatric diagnosis and high anxiety are the most important mental components of quality of life in patients with CP.

Our study has several limitations. First, the number of patients was relatively small, and the study was performed in a single tertiary care center; therefore, our result may not be generalized to all CP patients. Second, patients with multiple pain etiologies were included in the study, and we did not evaluate pain duration. Conversely, our study is valuable in reflecting the heterogeneous character of CP. Third, the cross-sectional design restricts a causal association between psychiatric disorders and CP in patients. However, these results should be confirmed by prospective studies.

Despite some limitations, this study suggests that prevalence of psychiatric morbidity in patients with CP was higher than in the control subjects. CP patients with psychiatric disorders had worse sleep and quality of life than CP patients without a psychiatric disorder. CP is a multidimensional phenomenon, impairing the patient's social and psychological well-being. Nowadays, an interdisciplinary approach is gaining importance for CP's diagnosis and treatment. Psychiatric assessment is essential for effective management of both pain and a psychiatric disorder.

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