



# ORIGINAL: Anxiety and Depression as a Factor of Disability in People with Chronic Low Back Pain Referred to the Orthopedic Clinic of Touba Clinic, Sari in 2018

Shahrazad Khosravifar	Department of Psychiatry, Iran University of Medical Sciences, Tehran, Iran.
Mohammadmoein Maddah	Student Research Committee, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
Mahdi Abounoori	Student Research Committee, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
Shaghayegh Khosravifar	Department of Psychiatry, Isfahan University of Medical Sciences, Isfahan, Iran.
Hamed Jafarpour	Student Research Committee, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
Mani Mahmoudi	Knee and sport medicine researchh and education center, Milad Hospital, Tehran, Iran.

## ARTICLE INFO

**Submitted:** 03 May 2021  
**Accepted:** 30 May 2021  
**Published:** 29 Jun 2021

### Keywords:

**Anxiety;  
Depression;  
Low Back Pain**

### Correspondence:

**Mani Mahmoudi**, Knee and sport medicine research and education center, Milad Hospital, Tehran, Iran.

#### Email:

dr.mani.mahmoudi@gmail.com

**ORCID:** 0000-0002-0738-3118

### Citation:

Khosravifar Sh, Maddah M, Abounoori M, Khosravifar Sh, Jafarpour H, Mahmoudi M. Anxiety and Depression as a Factor of Disability in People with Chronic Low Back Pain in Patients Referred to the Orthopedic Clinic of Touba Clinic, Sari in 2018. Tabari Biomed Stu Res J. 2021;3(2):25-35.

10.18502/tbsrj.v3i2.6670

## ABSTRACT

**Introduction:** Chronic pain is one of the most common diseases in today's world, which has a serious influence on the quality of life. Low back pain (LBP) is very common in developed and developing countries. This study aimed to investigate anxiety & depression as a disability factor in chronic LBP in patients referred to the Orthopedic Clinic of Touba Clinic in Sari, Iran in 2018.

**Material and Methods:** The Ronald-Morris Disability Questionnaire was used to assess disability, the Beck Anxiety Questionnaire was used to assess anxiety, the Beck Depression Questionnaire was used to assess depression, the SF-36 was used to assess quality of life, and the Visual Analog Scale was used to assess pain.

**Results:** In this study, 100 patients were studied. Seventy were female and 30 were male. The mean age of patients was  $45.05 \pm 11.45$  years. Sixty five patients suffered from depression and 35 patients had normal depression. The mean score for disability was 14.05, and the mean and standard deviation from the pain score of patients was  $36.2 \pm 2.7$ .

**Conclusion:** Depression is one of the disability factors in people with chronic LBP in patients referring to the orthopedic clinic of Touba Clinic in Sari city in 2018.

## Introduction

All over the world, chronic diseases are the most important pain reason which influence people's life quality seriously (1). Low back pain (LBP) is one of the most common chronic diseases in advanced and developing countries, where about 60 to 80 percent of people suffer from

that (2). Non-specific chronic LBP is a type of LBP that there are no known causes for it (3). Although often chronic LBP improves on its own, half of the patients refer to long-time or multi-time LBP in their life (4). 12 to 45 percent of adults and about 60 to 80 percent of the community faced chronic LBP at least

one time in their life (5). Also, 25% of work disability compensation costs and 12% of Sick leaves are caused by chronic LBP (6). Eventually, the prevalence of LBP between males and females is the same but the low back surgery is double in men (7). The spread of LBP is different between workers, students, and pregnant women in Iran (8). Pain complications including smoking, sleep disorders, sleeplessness, and fatigue of work are some titles that investigators have not researched. Also, there isn't enough evidence about the economic and social complications of chronic pain in Iran. Different studies showed that chronic pain often accompanies psychiatric symptoms, especially anxiety and depression. Depression and indicators of psychiatric disorders are highly correlated in patients with chronic pain (9-12). Socio-psychological features have an important role in length and severity of the pain and psychological treatments decrease the pain (13). Fear of pain is a common emotion that causes patients with LBP to limit their movements, as well as increasing depression and negative emotions. That has a huge impact on their quality of life (14). A study on workers who had to move heavy masses, demonstrated that LBP is the main reason for job disappointment. So controlling the disability factors help these patients to decrease their social-psychological problems (15).

Different articles revealed the relationship between disability and pain (16-18). Based on previous researches, this study is going to survey psychiatric problems of the patients with LBP to achieve a better concept of this disability. It may suggest combining common treatments with psychiatric therapies.

## Methods

### Goal society

This study is a descriptive-analytical on patients between 18 to 70 years old who complained of resistant LBP in recent 3 months and referred to Touba orthopedic clinic, Sari, Iran in 2018. The patients with dementia, mental retardation, organic mental

disorders, severe musculoskeletal disorders, uncompleted tests, and those who didn't fill the questionnaires completely had been removed from the study.

### Size of society

Based on Sagheer and others in 2013 that the incidence of depression in patients with LBP reported 48%, with a 95% confidence interval and a power of 90%, assuming the relevant data loss during the study, the study population was considered to be 100 persons.

### Ethical considerations

The study performed on people did not cause any physical or mental harm to them and had no side effects. In this study, no intervention was made in the course of treatment. The information of all patients remained confidential and the publication of the data was anonymous.

### Study method

Patients were enrolled in the study with written consent and Ronald-Morris Disability questionnaire to measure disability, Beck Anxiety Inventory to measure anxiety intensity, Beck Depression Inventory to measure the severity of depression, and SF-36 to measure the quality of life and Visual Analog Scale criteria were completed by them to measure pain intensity. Also, the demographic information of the patients was entered into a separate checklist.

### Data collection tools

Ronald-Morris Disability: One of the most effective methods of physical function in patients with chronic pain is the Roland-Morris Disability Questionnaire (RMDQ). With 24 items, RMDQ covers a wide range of aspects of daily life and requires patients to respond to each item by referring back pain. The validity, reliability, and sensitivity of RMDQ have been verified with patients with chronic low back pain (CLBP) and chronic heterogeneous pain. All 24 items are answered with "Yes" and "No". The measurement system is also simple and varies from 0 (without disability) to 24 (severe

disability). In the Asghari study, internal compatibility, test reliability, and concurrent and predicted validity for M-RMDQ were calculated. Internal compatibility of M-RMDQ items was acceptable (Cronbach's  $\alpha = 0.88$ ). The reliability of the retest was high with an average of 36 days between evaluations in 76 patients with chronic pain (ICC = 0.90). Validity was confirmed with a significant correlation between M-RMDQ scores, depression, and pain intensity. As a result, it was stated that M-RMDQ has sufficient reliability and validity and can be used as an accurate measure of physical disabilities related to chronic pain among the Iranian population (19).

Beck Anxiety Inventory (BAI) (16): The BAI scale was developed by Aaron Beck and colleagues in 1990 to assess the severity of clinical anxiety symptoms. In their study, they explained the scale's anomaly and psychometric results. It was performed on 160 patients in the first research (20). Another study was conducted on 367 outpatients in addition to this one (21). Both studies support the questionnaire's validity as a tool for assessing anxiety. The BAI is a questionnaire that is used to assess anxiety and consists of 21 items with four options. Every item is related to one of the anxiety symptoms that people who are clinically anxious or in a state of anxiety commonly experience. Questionnaires were given to 112 previous stage subjects to achieve the test-retest reliability factor (randomly). Validity 261 patients were clinically interviewed to achieve validity. The answers are graded as follows: 0 (no point), 1 (mild), 2 (moderate), and 3 (severe) (3). In this way, a person's score range can range from zero to 63. The mean age of the anxious sample participating in this study was 52.27 for men and 17.28 for women. A total of 123 men (47.1%) and 138 women (52.9%) were anxious and 741 men (48.9%) and 772 women (51.1%) from the general population participated in this study. As a result, BAI validity factor: The results of calculating the correlation between intra-class classes between the two variables of scores obtained from the BAI questionnaire

and the assessment of a clinical specialist about the level of anxiety in the anxious population, show that the test has good validity ( $P < 0.001$ ,  $r = 0.72$ ). BAI reliability factor: Calculation of the interclass correlation between test and retest scores in the anxious population shows that the reliability of the BAI questionnaire is appropriate in the Iranian population ( $P < 0.001$ ,  $r = 0.83$ ). BAT Internal Stability: To determine the internal consistency of the BAI questionnaire items, Cronbach's alpha calculation was used, which showed high internal stability ( $\text{Alpha} = 0.92$ ) (22).

The Beck Depression Inventory (BDI-13) is a short version of the Beck Depression Inventory that can be used in clinical and research settings to screen for and assess depression. There are 13 different ways to rate the severity of depressive symptoms, ranging from 0 to 3. (From normal to mild depression). Mild to moderate depression (8-11); moderate depression (12-15); and severe depression (16-19) are used to determine overall scores (16-39). Dadfar et al. investigated structural validity and factor structure in their study. With a Cronbach's alpha of 0.85 and strong structural validity based on a positive and appropriate correlation with other mental health issues, this instrument was validated with high confidence (23).

SF-36: The 36-item Quality of Life Questionnaire (SF-36) has 36 questions and consists of 8 subscales, and each subscale consists of 2 to 10 items. The eight subscales of this questionnaire are Physical Function (PF), Role Impairment for Physical Health (13), Role Impairment for Emotional Health (RE), Energy / Fatigue (EF), Emotional Well-Being (EW), Social Function (SF), Pain (P) and general health (GH). Also, from the integration of subscales, two general subscales with the names of physical health and mental health are obtained. In this questionnaire, a lower score indicates a lower quality of life and vice versa. In the study of Ghaffari et al., 340 people over the age of 18 in the general population of Qom entered the study by filling out a questionnaire. The data

was collected using a two-part questionnaire, the first of which included demographic information such as age, sex, marital status, educational status, employment status, and place of residence. The reliability and validity of the Persian version of the SF-36 questionnaire were determined in the second part using the second version of the questionnaire. The second version of the SF-36 questionnaire was examined to assess the quality of life. In general, considering all aspects of quality of life in this study, the mean score was  $69.78 \pm 67.14$ . This mean was  $28.67 \pm 91.15$  in men and  $97.14 \pm 67.03$  in women, which was significantly different between the sexes. Cronbach's alpha coefficient was calculated to be 0.91 (24).

VAS: Measuring pain in patients with chronic pain is of particular importance. Therefore, to achieve this goal, various tools have been designed, of which the visual instrument for measuring the amount of VAS pain is one of the most reliable tools. The visual instrument for measuring the amount of pain, on the other hand, is the most basic tool for assessing the amount of pain in patients, and it is easily understood by the patient. The left side (number zero) of this tool indicates no pain, while the right side (number 10) indicates the most severe pain. Mild pain is scored 3-1, moderate pain is scored 4-7, and severe pain is scored 8-10. The VAS questionnaire and the McGill pain questionnaire were compared in Rezvani et al study. The correlation between these two questionnaires was  $r=0.86$ , indicating that the amount of pain measured by these two instruments is very similar.

### Statistical analysis

The data distribution was examined by drawing a histogram and performing Kolmogorov-Smirnov statistical test. Then, quantitative data were described while calculating the mean (standard deviation) or median (mid-quarter spectrum), and qualitative data were described while calculating the frequency (percentage). Then, while statistical analysis, Pearson or Spearman correlation coefficient was calculated for the specific purposes of the

study. Multiple Linear Regression was also performed to determine the coefficient of determination of each of the independent variables. It should be noted that all descriptions and analyzes will be done using IBM SPSS21 software and in all cases, the value of two-way P less than 0.05 was the statistical judgment.

## Results

In our study, 100 people were included in the study, of which 70 were women and 30 were men. The mean age of patients was  $45.05 \pm 11.45$  with a minimum age of 21 years and a maximum of 61 years. The number of patients with depression was 65 with mild, moderate, and severe severity of 9%, 31%, and 25%, respectively.

Based on the Beck Depression Inventory questionnaire, we found that 35% had no depressive symptoms, scored less than 4, 9% had mild depression, 31% had moderate depression, and 25% had severe depression. It was observed that 65% of the sample had some form of depressive disorder and the incidence of depression was increasing among patients with low back pain and its prevalence was significant ( $p = 0.004$ ). The mean depression score of the sample was 10.42.

Also, according to the Beck anxiety inventory questionnaire, studies showed that 23% had no symptoms of anxiety, 19% had mild anxiety, 34% had moderate anxiety, and 24%

**Table 3-4. Frequency of depression with different intensities in patients with chronic low back pain**

variable	intensity	quantity (percentage)
Depression	No depression	35 (35)
	Low	9 (9)
	Middle	31 (31)
	High	25 (25)
Anxiety	No anxiety	23 (23)
	Low	19 (19)
	Middle	34 (34)
	High	24 (24)

**Table 7-4. Determining the burden of severity of disability in patients with chronic low back pain in patients referred to Toubia Clinic orthopedic clinic**

Mean	Standard deviation	t	df	p
14.05	5.14	3.987	99	0.000

had severe anxiety. It was observed that 77% of the sample had some kind of anxiety disorder. Anxiety is increasing among patients with low back pain and its prevalence is significant ( $p = 0.000$ ). The average score of anxiety was 17.80.

The mean score of severity of disability in patients with chronic low back pain was 14.05, and according to the results of a single sample t-test, it can be said that patients have more severity of disability ( $p=0.000$ ).

**Table 4-9. Determining the burden of quality of life in patients with chronic low back pain in patients referred to the orthopedic clinic of Touba Clinic in Sari**

Mean	Standard deviation	t	df	p
36.64	23.10	-6.645	99	0.000

The average quality of life in patients with chronic low back pain was 34.64, which according to the results of a single t-test can be said that patients have a low quality of life ( $p=0.000$ ).

**Table 4-10. Determining the correlation coefficient between the burden of depression and the burden of severity of disability in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
0.583	100	0.000

The results showed that there is a significant correlation at the error level of 0.05 between depression and the severity of disability, the severity of which is 0.583 and is positive.

**Table 11-4. Determining the correlation coefficient between the burden of depression and the burden of pain intensity in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
0.553	100	0.000

**Table 4-12. Determining the correlation coefficient between the burden of depression and quality of life in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
-0.597	100	0.000

The results showed that there is a significant correlation at the error level of 0.05 between depression and pain intensity that the intensity of this correlation is 0.553 and its direction is positive.

The results showed that there is a significant correlation at the error level of 0.05 between anxiety and baker's severity, the severity of which is 0.501 and its direction is positive.

**Table 4-14. Determining the correlation coefficient between anxiety burden and pain intensity burden in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
0.528	100	0.000

The results showed that there is a significant correlation at the error level of 0.05 between anxiety and pain intensity, the intensity of this correlation is 0.528 and its direction is positive.

**Table 15-4. Determining the correlation coefficient between anxiety burden and quality of life in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
-0.532	100	0.000

The results showed that there is a significant correlation at the error level of 0.05 between anxiety and quality of life, the intensity of this correlation is -0.532 and its direction is negative.

The results showed that there is a significant correlation at the error level of 0.05 between quality of life and the duration of the disease, the severity of this correlation is -0.488 and

**Table 16-4. Determining the correlation coefficient between the duration of the disease and the burden of quality of life in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
-0.488	100	0.000

**Table 17-4. Determining the correlation coefficient between the burden of depression and**



**the duration of the disease in patients with chronic low back pain**

correlation coefficient	Degree of independence	p
0.435	100	0.000

its direction is negative.

The results showed that there was a significant correlation at the error level of 0.05 between depression and the duration of the disease, the severity of this correlation was 0.435 and its direction was negative.

**Table 18-4. Regression analysis between age, sex, depression burden, anxiety burden and duration of illness with severe disability in patients with chronic low back pain**

Source of effect	sum of squares	Degree of independence	Average sum of squares	The value of f	p	r	R2
regression	1191.435	5	238.287				
error	1425.315	94	15.163	15.715	0.000	0.675	0.455
total	2616.750	99					

**Table 19-4. Estimation of regression coefficients and contribution of each variable in explaining the severity of disability**

variable	Non-standard coefficient	The standard error	standard beta	t	p
fixed	7.076	1.697	-	4.168	0.000
depression	0.194	0.053	0.364	3.628	0.000
anxiety	0.103	0.047	0.208	2.215	0.029
sex	1.418	0.859	0.127	1.650	0.102
age	0.036	0.036	0.080	0.988	0.326
Duration of disease	0.034	0.014	0.224	2.511	0.014

#### **Determining the coefficient of determination (share) of variables of age, sex, depression burden, anxiety burden and duration of illness in the severity of disability in patients with chronic low back pain**

Linear regression has been used to investigate the above objective hypothesis. The results showed that the effect of simultaneous multiple correlation was equal to 0.675 and the coefficient of determination was equal to 45.5%. The results of regression analysis showed that the linear relationship pattern to the data could be fitted. The results showed the estimation of the parameters.

Studies showed that at the error level of 0.05, the variables of depression with an impact factor of 0.364, anxiety with an impact factor of 0.208, duration of illness with an impact factor of 0.224 were significant and the effect of gender and age was not significant.

#### **Determining the coefficient of determination (share) of variables of age, sex, depression burden, anxiety burden and duration of pain in patients with chronic low back pain**

Linear regression has been used to investigate the above objective hypothesis. The results showed that the effect of simultaneous multiple correlation was equal to 0.447 and the coefficient of determination was equal to 66.9%. The results of regression analysis showed that the linear relationship pattern to the data could be fitted. The results showed the estimation of the parameters.

#### **Determining the coefficient of determination (share) of the variables of age, sex, depression burden, anxiety burden and duration of illness in the quality of life of patients with chronic low back pain**

Linear regression has been used to investigate the above objective hypothesis. The results

**Table 20-4. Regression analysis between age, sex, depression burden, anxiety burden and duration of pain intensity in patients with chronic low back pain**

Source of effect	sum of squares	Degree of independence	Average sum of squares	The value of f	p	r	r2
regression	248.540	5	49.708				
error	307.460	94	3.271	15.167	0.000	0.669	0.447
total	556.00	99					

**Table 21-4. Estimation of regression coefficients and contribution of each variable in explaining pain intensity**

variable	Non-standard coefficient	The standard error	standard beta	t	p
fixed	3.307	0.788	-	4.194	0.000
depression	0.074	0.025	0.285	2.966	0.004
anxiety	0.059	0.022	0.259	2.737	0.007
sex	0.296	0.399	0.058	0.743	0.459
age	0.035	0.017	0.168	2.049	0.043
Duration of disease	0.013	0.006	0.191	2.121	0.037

**Table 22-4. Regression analysis between age, sex, depression burden, anxiety burden and duration of quality of life in patients with chronic low back pain**

Source of effect	sum of squares	Degree of independence	Average sum of squares	The value of f	p	r	r2
regression	26255.518	5	5051.104				
error	26575.997	94	282.723	18.573	0.000	0.705	0.497
total	52831.514	99					

showed that the effect of simultaneous multiple correlation was equal to 0.497 and the coefficient of determination was equal to 70.5%. The results of regression analysis showed that the linear relationship pattern to the data could be fitted. The results showed the estimation of the parameters.

Studies showed that at the error level of 0.05, the variables of depression with an impact factor of -0.343, anxiety with an impact factor of -0.226, duration of illness with an impact factor of -0.178 and age with an impact factor of -0.212 were significant. And the magnitude of the effect of gender was not significant.

**Table 23-4. Estimation of regression coefficients and contribution of each variable in explaining quality of life**

variable	Non-standard coefficient	The standard error	standard beta	t	p
fixed	76.147	7.330	-	10.389	0.000
depression	-0.864	0.231	-0.343	-3.747	0.000
anxiety	-0.502	0.201	-0.226	-2.500	0.014
sex	-1.684	3.710	-0.034	-0.454	0.651
age	-0.427	0.157	-0.212	-2.709	0.008
Duration of disease	-0.121	0.059	-0.178	-2.075	0.041

## Discussion

Low back pain is a common health problem in both developed and developing countries, affecting 60 to 80 percent of adults at some point in their lives (3). Attention to psychological factors and pain complications such as absence from work, smoking, sleep problems, and fatigue caused by work or insomnia, is still neglected and a complete study on the volume of economic and social damage caused by chronic pain in Iran Not done. Several studies have found that chronic pain is frequently associated with psychological symptoms, particularly anxiety and depression, and that depression and indicators of psychiatric disorders are related to patients with chronic pain strongly (9-12). Psychosocial factors can play a role in the

duration of pain and disability, and psychological therapies can help to reduce pain (13). Emotional problems with low back pain also help treat the disease (25). Fear of pain seems to be one of the important psychological factors in disability and absence from work in patients with chronic low back pain. Patients' beliefs and fears about symptoms and activity lead to ineffective treatment of symptoms such as pious behaviors and limiting activity and depression. These behaviors lead to immobility and not feeling well in the patient. Also, failure to diagnose all relevant factors, sometimes contradictory theories about these factors, leads to the use of treatments that are not successful and affect their quality of life (14).

Pana et al. reported that those with a low

sense of control over their health experienced higher levels of depression. They suggested that HLoC may help identify depression in patients with chronic lower back pain and could potentially be a target for therapeutic intervention (26). The effect of depression on pain, as well as the effect of pain on depression, were investigated in patients with low back pain in the previous study, but the goal of our study was to compare the effect of pain on depression in case and control groups. The results of our study showed that there is a positive correlation between the severity of depression and the severity of pain. Also, there was a positive correlation and a statistically significant relationship between the severity of pain and the severity of chronic low back pain.

Robertson D et al. Evaluated 1,013 first-year Canadian university students to examine the association between low back pain and depression and physical complaints in an adult Canadian population. More than 50% of people reported low back pain throughout the classroom. Depression and physical complaints were also significantly associated with low back pain. Several positive relationships were also observed to match physical complaints and depression with different types of low back pain (27). In this study, the prevalence of depression in students with low back pain with physical complaints was investigated, but in our study, this study was performed on patients with low back pain referred to the hospital. There was a statistically significant relationship between chronic low back pain and the prevalence of depression. There was a statistically significant relationship between the severity of depression and the severity of disability in these patients. The results of our study were very consistent with Robertson D's study.

Marshall PWM et al., in a cross-sectional study entitled "Physical activity and the mediating effect of fear, depression and catastrophic anxiety on pain disability in people with chronic low back pain" examined 218 patients with chronic low back pain. Fear, anxiety, and depression mediated the

relationship between pain and disability ( $p < 0.001$ ). The interaction effect of anxiety, on the other hand, was dependent on weekly physical activity. In other words, people who reported hours of physical activity per week reported the indirect effect of anxiety on the relationship between pain and disability more than those who did not report any physical activity per week (28). The interaction of anxiety, depression, and fear on disability due to low back pain was investigated in the previous study, but there was a statistically significant relationship between chronic low back pain and the prevalence of depression in the current study. There was a statistically significant relationship between the severity of depression and the severity of disability in these patients. Anxiety and quality of life were also assessed, which is one of the strengths of our study. In our study, there was a statistically significant relationship between chronic low back pain and the prevalence of anxiety. There was a statistically significant relationship between the severity of anxiety and the severity of disability in these patients. Our study was highly consistent with the results of the Marshall PWM study.

Davoudian Talab et al., Among 179 industrial workers, "compared the musculoskeletal pain between depressed and non-depressed workers. This study showed that 36.2% of the samples had low to severe depression, a comparison of skeletal disorders." Muscularity in depressed and depressed individuals showed that the degree of pain in some dimensions is significantly different between different workgroups and its rate is higher in office workers than in other work units (29). In our study, 65% of participants were depressed, which was twice as many as Davoodian's study. Also, Davoodian's study examined the relationship between work type and type of pain with depression, but in our study, only the relationship between low back pain and depression and its relationship with a disability was examined. Depression was common, and there was a statistically significant correlation between the severity of



depression and the severity of disability in these patients.

In their study in 2016, Shahbazi et al. examined the relationship between disability and depression, cognitive status, and mood in the elderly. Ninety people participated in the study. 34.4% (n = 31) of the participants were men and 65.6% (n = 59) were women. The mean disability score of the elderly was  $20.13 \pm 61.66$ . There was a significant relationship between the mean score of disability and depressive status ( $P < 0.001$ ), cognitive status ( $P < 0.001$ ), and mood of the elderly ( $P < 0.001$ ). This relationship is directly related to depression and inversely related to cognitive status and mood; that is, as depression scores rise and cognitive status and morale scores fall, the elderly's rate of disability rises (30). In our study, as in the above study, 70% of the participants were female and 30% male, so the study population of the two studies was very similar. There was a statistically significant relationship between chronic low back pain and the prevalence of depression. There was a statistically significant relationship between the severity of depression and the severity of disability in these patients. The results of the above study were consistent with our study.

### Conclusion

The results of this study showed that there was a statistically significant relationship between chronic low back pain and the prevalence of depression and anxiety. There was a statistically significant relationship between the severity of depression and the severity of disability in these patients. Depression was negatively correlated with quality of life and disease duration. There was also a statistically significant relationship between chronic low back pain and the prevalence of anxiety. There was a statistically significant relationship between the severity of anxiety and the severity of disability in these patients. This study introduces depression and anxiety as the factors of disability in people with chronic

low back pain in patients referred to the orthopedic clinic of Touba Clinic, Sari in 1397.

### Conflicts of interest

The authors declare no conflicts of interest.

### Authors' contributions

All authors have intellectually committed to the study design and process. The final manuscript was revised and accepted by all authors.

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