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The Level of Depressive Symptoms and Related Factors in Patients with Chronic Low Back and Neck Pain

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ABSTRACT

Objective: The number of patients with back and neck pain, which we frequently encounter in neurosurgery practice, is too high to be underestimated, especially in today's conditions. Unfortunately, it is known that it causes serious labour force and economic losses as well as negatively affecting the social lives of individuals. The etiology of low back and neck pain is multifactorial and it is usual to encounter with depressive mood.

Material and Methods: The study included 76 patients presenting with low back and neck pain and 48 healthy individuals who had not undergone spinal surgery in the control group. Beck Depression Scale (BDS) was used to question the sociodemographic characteristics of the patients and whether they had a history of previous spinal surgery. The data analysed in SPSS 22 software.

Results: In our study, BDI scores were found to be higher in the control group in those who regularly used analgesics for pain ($p < 0.05$). In the patient group, BDI scores were higher in smokers, those who reported irregular diet and those who had previously received psychological support ($p < 0.05$). In addition, patients who lived in the city centre, had irregular diet and smoked had higher BDI scores compared to the control group.

Conclusion: Chronic low back and neck pain affects the functional status of individuals and may cause psychological problems such as depression. Low back and neck pain are diseases characterised by multifactorial interactions. Patients may be recommended to undergo physical and psychological examinations and psychological counselling.

Keywords: Chronic low back, chronic neck pain, beck depression scale.

ÖZET

Giriş: Beyin cerrahi pratiğinde sıklıkla karşılaştığımız bel ve boyun ağrılı hastaların sayısı özellikle günümüz koşullarında küçümsenmeyecek kadar fazladır. Bireylerin sosyal hayatlarının olumsuz etkilemesinin yanında ciddi iş gücü kaybı ile ekonomik kayıplara neden olduğu maalesef bilinmektedir. Bel ve boyun ağrıların etyolojisi multifaktöriyeldir ve depresif duygu durum ile karşımıza çıkması olağandır.

Gereç ve Yöntem: Çalışmaya bel-boyun ağrısı şikayeti ile başvuran 76 hasta ve kontrol grubu olan daha önce spinal cerrahi geçirmemiş 48 sağlıklı birey dahil edilmiştir. Beck depresyon ölçeği (BDÖ) ile kişilerin sosyodemografik özellikleri, geçirilmiş herhangi bir cerrahi-spinal cerrahi öyküsü olup olmadığı da sorgulanmıştır. Çalışma verileri SPSS 22 programı kullanılarak analiz edilmiştir.

Bulgular: Çalışmamızda, BDÖ puanları kontrol grubunda; ağrısı için düzenli analjezik kullananlarda yüksek bulunmuştur ($p < 0,05$). BDÖ puanları hasta grubundaki sigara kullanan, düzensiz beslendiğini ifade eden ve daha önce psikolojik destek alanlarda yüksekti($p < 0,05$). Ayrıca il merkezinde yaşayan, düzensiz beslenen, sigara kullanan hastaların kontrol grubuna göre BDÖ puanları yüksekti.

Sonuç: Kronikleşen bel ve boyun ağrıları bireylerin fonksiyonel durumlarını etkilerken depresyon gibi psikolojik sorunlar da doğurabilmektedir. Bel ve boyun ağrıları, multifaktöriyel etkileşimlerle karakterize hastalıklardır. Hastaların fiziksel ve ruhsal muayeneleri ile psikolojik danışmanlık almaları önerilebilir.

Anahtar Kelimeler: Kronik bel ağrısı, kronik boyun ağrısı, beck depresyon ölçeği.

The majority of patients evaluated in the neurosurgery clinic are patients with complaints of low back and neck pain. Neck pain is the most common problem after back pain. The causes of back and neck pain are, as expected, multifactorial. Sociodemographic characteristics of individuals also affect back and neck pain, which may include their profession, income, educational status and working life.

While 70-80% of people experience low back pain throughout their lives, the incidence within a year varies between 11-12% (1,2). Pain becomes chronic if it lasts longer than 12 weeks. Various studies have shown that low back pain becomes chronic at a rate of 20% and neck pain becomes chronic at a rate of 40% (3-6).

These symptoms, such as waist and neck pain, affect the musculoskeletal system and can become chronic; It is known that in addition to negatively affecting people's social lives, it significantly reduces their functional-physical capacities and causes serious workforce loss and economic difficulties. It is known that in these patients, whom we frequently encounter in neurosurgery outpatient clinics, low back pain regresses within a month with conservative methods, and that it still persists after a year in 37-54% of the patients (7). The rate of patients receiving surgical treatment was found to be only 2% (8). The most common known cause of low back pain is lumbar disc herniation, followed by lumbar spinal stenosis, which is one of the degenerative spine diseases, spondylolisthesis, infections and malignancies. Epidemiological studies show that the prevalence of neck pain is close to that of low back pain. Although the incidence of neck pain varies throughout life, the incidence of neck pain also increases with advancing age (9).

Sampath et al. in their study on patients with cervical radiculopathy and neck pain, they compared surgical and conservative treatment methods and found that both treatment methods reduced pain, but surgical treatment was more effective than conservative methods (10).

Waist and neck pain is a crisis situation that can develop not only due to medical or organic reasons, but also due to physiological, social, economic and psychological reasons. Patients think that when they suffer from this pain, they will not be able to work and therefore will experience financial difficulties. On the other hand, they also feel physically weak and struggle with pain. Therefore, they may face thoughts such as turning into an addicted individual and helplessness, which may cause them to feel anxiety, a decrease in their interest and desire for the life they have in their daily lives, and a depressive state such as discontent, sadness, grief, unhappiness and hopelessness. It has been reported that feelings of anxiety and depression are more common, especially in people with physical diseases (11).

It is also known that back and neck pain increases with depression. Studies have shown that 75-80% of depression patients have clinical symptoms such as headache, waist and neck pain (12,13).

In our study, 76 patients who applied to the neurosurgery outpatient clinic due to back and neck pain between July and September 2023 and 48 healthy individuals as a control group were taken into consideration and compared by questioning the Beck depression scale (BDI), sociodemographic characteristics and any surgery or spine surgery history.

Material and Method

Our research was conducted by the Kayseri City Hospital Neurosurgery Clinic between July and September 2023, with patients presenting to the outpatient clinic with chronic low back pain, chronic neck pain, or both. The people included in the study were informed about the study, their written consent was obtained, and the study was conducted in accordance with the principles of the Declaration of Helsinki. For the study, permission numbered 04.01.2023, 76397871 was obtained from our hospital and ethics committee approval dated 23/10/2023 and 2023/009-00 numbered was obtained from Nuh Naci Yazgan University, Ethics Committee.

Study Design

The sample of the study was obtained as 120 people, including 75 patients and 45 control groups, using literature information and Number Cruncher Statistical System (NCSS) 2007 & Power Analysis and Sample Size (PASS) 2008 Statistical Software (Utah, USA). A total of 76 patients aged 18-75 with chronic low back and neck pain, regardless of gender, were included in the study. The control group consisted of 48 healthy individuals who had not previously undergone spine surgery. The patients and the control group were given a questionnaire that questions;

sociodemographic data such as age, gender, place of residence, education and economic status, and consists of a total of 22 questions, 4 of which are open-ended, focusing on behavior regarding smoking and alcohol use, exercise, and nutrition, and includes a 21-question **Beck Depression Scale (BDS)** collected. The face-to-face interview method was conducted by a single researcher. The patient and control groups included in the study; Height (cm), Body Weight (kg), BMI (Body Mass Index) were calculated on a weight and height meter with 0.01 kg precision, barefoot and wearing sports clothes.

Inclusion and exclusion criteria

Patients with complaints of low back or neck pain that persisted for more than three months were included in the study. Patients with pain due to cancer, infection and trauma were excluded from the study. People under the age of 18 and over the age of 75 were not included in the research. The control group included healthy individuals over the age of 18 who had no back or neck pain for the last three months, no history of spinal surgery, and no acute disease. The control group was made up of healthcare workers and their families.

Beck depression scale form

Beck Depression Scale (BDS), which consists of 21 questions and is used safely in our country, includes 4 options each and scores between 0 and 3 (not at all, 0; mild, 1; moderate, 2; severe, 3). It is a scale about how the individual feels in the last week, including the same day, in terms of generalized anxiety symptoms such as feeling of distress, and its Turkish validity and reliability were determined by Hisli (1989), and the Cronbach's alpha coefficient of the scale was found to be 0.80 (14,15).

History of spinal surgery and any previous surgery

The results of patients who underwent single or 2-level microdiscectomy, posterior stabilization and arthrodesis surgery up to 2 to 6 segments, narrow spinal canal surgery without single-distance arthrodesis, and patients who did not undergo spinal surgery were evaluated. Minimally invasive procedures (kyphoplasty, vertebroplasty, endoscopic discectomy) were not included in the study. All other previous surgical procedures are also marked as surgical history.

Statistical Analyses

The data collected for the study were recorded using the SPSS 22 program and analyzed in the same program. Frequency, percentage, mean value, standard deviation, highest and lowest (min-max) values and median were used for descriptive statistics. For statistical analysis of categorical data, Pearson Chi-square test and Fisher's Exact Test were applied for values below five. Shapiro Wilk test was used to check the suitability of the data for normal distribution. Since the data did not comply with normal distribution, Mann Whitney U test and Kruskall Wallis test were applied. Pearson Correlation coefficient was used to show the relationship between variables. Statistically significant difference was accepted as $p<0.05$.

Results

Of the 124 people included in this study, 82 (66.1%) were women and the average age was 40.10 ± 12.62 (min-max: 18-72) years. Of these 124 people, 76 (61.3%) are patients and 48 (38.7%) are controls. In the data obtained from the patients, the average age was determined as 43.80 ± 14.1 years, and in the control group it was 34.52 ± 6.8 years. It was observed that the number of women in the patient group was significantly higher among those aged 40 and over, those with secondary school education or lower, those who described their economic situation as poor, those who do not have any job and mostly live in the city center ($p<0.05$). While the average BDS score of the patients was 13.23 ± 7.94, it was 11.29 ± 10.26 in the control group. There was no significant difference in terms of scale scores in the patient and control groups ($p = 0.057$), but the BDS scores of the patients were higher than the control group. Sociodemographic data and BDS scores of the patient and control groups are given in **Table 1**. There was no significant relationship between BDS scores and sociodemographic variables in the patient and control groups, but BDS scores were lower in those with high education levels, those who defined their economic status as good, and men in the control group, and were higher in the unemployed group in the control group ($p>0.05$). However, BDI scores were found to be higher in the patient group living in the city center (**Table 1**).

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Table 1. Sociodemographic findings and BDS scores of the patient and control groups									
Variables		**Patient group**		**Control group**		**BDS scores**			**p***
						Patient		**Control**	
		n	%	n	%	Average./sd	Median	Average./sd	Median	
Gender	Female	56	73.7	26	54.2	13.3±8.5	12.0	12.7±11.4	11.4	0.413
	Male	20	26.3	22	45.8	13.0±6.2	12.5	9.5±8.5	8.5	0.073
	p	**0.025***				0.855***		0.263***		
Age	Under 40 age	40	52.6	34	70.8	12.8±7.5	13.0	10.4±7.1	9.5	0.176
	40 years and above	36	47.4	14	29.2	13.7±8.4	12.0	13.3±15.5	9.0	0.226
	p	**<0.001***				0.778***		0.964***		
Education Level	Middle school and below	43	56.6	0	0.0	14.2±8.3	14.0	-	-	-
	High school	18	23.7	9	18.8	14.0±8.0	12.0	15.2±16.9	9.0	0.438
	University	15	19.7	39	81.3	9.5±5.4	11.0	10.3±8.1	9.0	0.938
	p	**<0.001***				0.106***		0.587****		
Economical status	Good	9	11.8	20	41.7	9.5±4.0	9.0	8.4±5.8	8.0	0.508
	Moderate	54	71.1	22	45.8	13.7±7.2	13.0	12.8±12.7	10.0	0.174
	Worse	13	17.1	6	12.5	13.5±11.8	11.0	17.3±8.1	17.0	0.235
	p	**0,001***				0.212***		0.063****		
Family type	Nuclear family	71	93.4	44	91.7	13.2±8.1	12.0	11.4±10.4	9.0	0.083
	Extended family	5	6.6	4	8.3	12.6±3.6	14.0	10.5±8.6	10.5	0.624
	p	0.734**				0.900***		0.926***		
Working status	Working	25	32.9	44	91.7	12.7±6.1	13.0	10.7±9.9	9.0	0.088
	Not workig	51	67.1	4	8.3	13.4±8.7	12.0	17.3±13.6	19.5	0.581
	p	**<0.001***				0.951***		0.247***		
Longest lived place	City Center	62	81.6	27	56.3	12.4±6.6	12.0	8.9±7.3	8.0	**0.017**
	Town	6	7.9	17	35.4	21.5±16.0	13.5	15.5±13.7	12.0	0.420
	Village	8	10.5	4	8.3	12.8±6.5	13.0	10.0±5.1	10.0	0.495
	p	**0.001***				0.513***		0.154***		
All participants		76	100	48	100	13.2±7.9	12.0	11.2±10.2	9.0	<u>**0.057**</u>
*%Column Percentage *pearson chi square ** fisher's exact test *** Mann Whitney U Test, ****Kruskall Wallis Test. **BDS:** Beck depression scale.*										

Table 2. Some life behaviors and BDS scores in the patient and control groups									
Variables		**Patient group**		**Control group**		**BDS scores**			**p****
						Patient		**Control**	
		n	%	n	%	Average./sd	Median	Average/sd	Median	
Smoking	Positive	24	31.6	18	37.5	15.8±8.8	17.0	9.3±6.4	10.5	**0.018**
	Negative	52	68.4	30	62.5	12.0±7.2	12.0	12.4±11.9	9.0	0.440
	p	0.497*				**0.048***		0.701**		
Alcohol users	Positive	6	7.9	10	20.8	11.8±7.6	11.5	9.1±5.7	8.0	0.550
	Negative	70	92.1	38	79.2	13.3±8.0	12.5	11.8±11.1	9.5	0.132
	p	**0.036***				0.637**		0.567**		
Regular exercise	Yes	25	32.9	11	22.9	12.2±7.9	11.0	8.5±6.7	9.0	0.216
	No	51	67.1	37	77.1	13.7±7.9	13.0	12.1±11.0	9.0	0.120
	p	0.233*				0.352**		0.476**		
Nutrition status	Regular	59	77.6	27	56.3	11.9±6.3	12.0	9.7±7.4	8.0	0.092
	Irregular	17	22.4	21	43.8	17.8±10.9	15.0	13.3±12.9	11.0	<u>**0.060**</u>
	p	**0.012***				**0.023***		0.298**		
BMI Group	18.5-24.9	28	36.8	22	45.8	11.9±9.6	10.0	9.5±7.7	8.5	0.469
	25.0-29.9	21	27.6	15	31.3	13.3±7.1	12.0	11.6±13.8	9.0	<u>**0.074**</u>
	≥30	27	35.5	11	22.9	14.6±6.6	14.0	14.1±9.1	14.0	0.859
	p	0.325*				0.158***		0.298***		
*%Column Percentage *pearson chi square ** Mann Whitney U Test, ***Kruskal Wallis Test **BDS:** Beck depression scale.*										

Table 3. Disease and medication history and BDI scores in the patient and control groups									
Variables		Patient group		Control group		BDS scores				p***
						Patient		Control		
		n	%	n	%	Average/sd	Median	Average/sd	Median	
At least one chronic disease	positive	32	42.1	7	14.6	14.2±8.5	13.0	13.5±7.4	12.0	0.956
	negative	44	57.9	41	85.4	12.6±7.5	11.5	10.9±10.7	9.0	0.131
	p	**0.001***				0.396***		0.249***		
Presence of chronic disease in the family	Yes	6	7.9	5	10.4	12.0±3.4	12.0	10.4±9.3	9.0	0.715
	No	70	92.1	43	89.6	13.3±8.2	12.0	11.4±10.5	9.0	0.071
	p	0.748**				0.809***		0.852***		
Using medication regularly	positive	29	38.2	6	12.5	14.4±8.8	13.0	12.3±7.2	12.0	0.598
	negative	47	61.8	42	87.5	12.4±7.3	12.0	11.1±10.6	9.0	0.168
	p	**0.002***				0.330***		0463***		
Using analgesics regularly	positive	63	82.9	16	33.3	13.0±8.1	12.0	13.8±6.9	13.0	0.517
	negative	13	17.1	32	66.7	13.9±6.8	12.0	10.0±11.4	7.5	**0.041**
	p	**<0.001***				0.530***		**0.016***		
Other surgical history	positive	23	30.3	9	18.8	13.6±7.9	13.0	14.8±9.0	14.0	0.721
	negative	53	69.7	39	81.3	13.0±8.0	12.0	10.5±10.4	9.0	**0.030**
	p	0.154*				0.713***		0.106***		
Previous psychological treatment	Yes	19	25.0	8	16.7	17.6±10.1	18.0	12.6±7.0	12.0	0.221
	No	57	75.0	40	83.3	11.8±6.5	12.0	11.0±10.8	9.0	0.140
	p	0.273*				**0.011***		0.305***		
*Pearson Chi Square, ** fisher's exact test *** Mann Whitney U Test, **BDS:** Beck depression scale.										

There was no difference in smoking status between the patient and control groups, but the frequency of alcohol use was higher in the control group and the patient group stated that their nutritional status was more regular. Although there was no statistically significant difference between the groups, the prevalence of obesity was higher in the patient group. In the patient group, BDS scores were higher in those who smoked and reported irregular nutrition. BDS scores of smoking patients were higher than the smoking control group. Additionally, patients who described their nutritional status as irregular had higher BDS scores. Although there was no statistically significant difference, BDS scores were lower in healthy individuals who exercised regularly and ate regularly (p>0.05). A positive correlation was found between BMI and BDS scores of all participants (p = 0.041, p.cor. floor: 0.184). Details are given in *table 2*.

The presence of at least one chronic disease, regular medication use, and regular analgesic use history were significantly higher in the patient group (p<0.05). While BDS scores were high in the patient group who previously received psychological help, BDS scores were high in those who used regular analgesics in the control group (p<0.05). BDS scores of the control group, which did not use analgesics regularly and had not undergone surgery before, were significantly lower than the patient group. It is given in detail in *Table 3*.

Discussion

It is known that as back and neck pain becomes chronic, the functional-physical capacities of individuals decrease significantly, serious workforce losses occur, which leads to economic difficulties and negatively affects their social lives. Yilmaz et al. in their study showed that chronic low back pain affects people psychologically and is an important problem that requires help (12). In a study conducted by Takahashi et al., it was found that patients with low back pain were more depressed (16). In another study conducted on Hungarian workers, it was found that low back pain was also associated with depression (17).

According to our study results, BDS total score was higher in the patient group compared to the control group. In addition, the high BDS total score in the control group using regular analgesics for pain control suggests that pain may have increased the frequency of depressive symptoms.

Yazıcı et al. stated that depression was higher in patients with chronic back and neck pain and those with low education levels. Although there was no statistically significant difference in our study, BDS scores were lower in the patient and control groups in those with higher education levels and those who described their economic status as good (13). Educational status may be related to

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pain management, methods of coping with stress, and therefore the development of depressive symptoms. A good economic situation may have increased the social well-being of both the patients and the control group and contributed to the decrease in depressive scores. In the control group, it was observed that the highest BDS scores were obtained in those who described their economic situation as poor and were not working. In our study, BDS scores were found to be higher in the patient group living in the city center. It was thought that patients would be more affected by the problems of big cities such as transportation, infrastructure and crowded living.

In a systematic review study evaluating chronic low back pain risk factors, depression was also included among the chronic low back pain risk factors. Additionally, smoking and obesity have been shown to be other risk factors (18). In our study, BDS scores were higher in the patient group who smoked and reported irregular nutrition. Healthy individuals who ate and exercised regularly had low BDS scores, and there was a positive correlation between BMI and BDS scores. It is conceivable that healthy lifestyle behaviors reduce chronic pain and therefore reduce depressive symptoms. Regular exercise and nutrition behaviors are indirect indicators that individuals are self-confident and make time for themselves. It comes to mind that depression and psychosocial problems are less common in individuals with high self-care and awareness. In our study, regular analgesic use was found to be high in the patient and control groups. Analgesics taken for pain control may be aimed at relieving chronic pain or eliminating the fear of pain. The relationship between chronic pain and depression is known and this relationship is bidirectional. In fact, a study conducted in Japan showed that individuals with depression felt more severe pain (19). In our study, BDS scores were low in the control group who did not use analgesics or had a history of surgery. In other words, depressive symptoms are less common in individuals who do not have pain, have no analgesic history, and have not had a serious health problem before.

Conclusion

Chronic waist and neck pain is a disease characterized by bio-psychosocial multifactorial interactions. Due to its multidimensional nature, the evaluation and management of chronic low back and neck pain requires a multidisciplinary approach other than approaches focused on organic pathology. In addition to a detailed questioning and physical examination, the cause of the pain should

be determined by using laboratory tests and imaging methods. Social, emotional, cognitive, environmental and behavioral factors should be revealed. For the correct approach and treatment to people, patients must be diagnosed by questioning every aspect of their lives, including not only their physical condition but also their emotional state. Thus, it is possible to complete the treatment successfully. Psychological counseling can also be offered to patients who need it. Collaborating with psychological science can make significant contributions to ensuring the well-being of patients.

Declarations

Ethical Consent

The study was approved by the local ethics committee of Nuh Naci Yazgan University with the ethics committee permission dated 23/10/2023 and 2023/009-00 numbered, and consent was obtained from all participants in accordance with the Declaration of Helsinki before entering the survey. Also permission of study approval was approved by the local ethics committee of Kayseri City Hospital with the ethics committee approval dated 04.01.2023 and numbered 76397871 .

Conflict of Interest

The authors have no conflict of interest regarding this study.

Financial Disclosure

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Author Contributions

Detailing the work; project preparation, data collection and writing scientific papers, Op.Dr. YG has contributions. Op.Dr. ŞG contributed to the collection of data and writing and proof reading the scientific paper in the project. Dr.BO contributed to the collection of data, statistical analyses and proof reading.

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