

ORIGINAL ARTICLE

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The relationship of pain, sleeping pattern, quality of life, and kinesiophobia with depressive symptoms in patients with lumbar disc hernia

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Abstract

Pain, muscle spasms, loss of muscle strength, and deteriorated posture adversely affect the patient's daily life activities and quality of life. Within the scope of this research, we aimed to elucidate pain, sleep quality, quality of life, and kinesiophobia levels in patients with lumbar disc herniation and to determine their relationship with depressive symptoms. The data of 74 patients who applied to our institution between 01/01/2020 – 01/04/2023 with a diagnosis of lumbar disc herniation have been analyzed retrospectively Sociodemographic information form (SIF), Nottingham Health Profile (NHP), Tampa Kinesiophobia Scale (TKS), Pittsburgh Sleep Quality Index (PSQI), Beck Depression Scale (BDS), and Visual Analogue Scale (VAS) were applied to the participants in the study. A statistically significant difference has been achieved between the groups in the VAS pain severity, TAMP, Pittsburgh sleep quality scale, 1, 2 in the NSP scale, and the sub-dimensions of emotion, sleep, social, physical and energy ($p < 0.05$). All scale scores of patients with depressive symptoms were higher than those without depressive symptoms. A statistically significant relationship existed between BDS scores and all scale scores ($p < 0.05$). The patients' BDS scale score and VAS pain severity, TAMP, NSP (pain), and NSP (physical) scale scores were low, Pittsburgh, NSP (emotion), NSP (sleep), NSP (social), NSP (energy), NSP 1. It was observed that there was a moderate relationship between the 2 scale scores. Regarding the outcomes of this research, one could say that depressive symptoms negatively affect sleeping patterns and the quality of life of patients with lumbar disc hernia.

Keywords: Lumbar disk hernia, depressive symptoms, pain, quality of life, kinesiophobia

Introduction

Pain, muscle spasms, loss of muscle strength, and deteriorated posture adversely affect the patient's daily life activities and quality of life (QoL). Chronic pain may co-exist with insomnia, anxiety, and depressive symptoms and manifest as a medical, social, and economic problem, resulting in a secondary decline in activity. It has been reported that the incidence of depressive symptoms in patients with chronic pain varies between 10 – 100%, usually above 50% [1].

Low back pain is one of the most common public health problems that cause disability and loss of work productivity, leading to insufficiency in musculoskeletal system functions. Low back pain's lifetime prevalence is over 70% in industrialized countries [2]. Lumbar disc herniation (LDH) is a common health

problem that causes functional disability and is characterized by low back and leg pain. The mood and cognitive behaviors of patients with low back pain are also important factors delaying the rehabilitation process. Not only the underlying pathology but also social, cognitive, emotional, and behavioral factors are determinative for the disability status [3].

Kinesiophobia is a topic that researchers have focused on in recent years as a factor that causes the persistence of pain and limits activities in patients with chronic lower back pain. It has been reported that the pain patients constantly feel in lower back pain cannot be explained by clinical findings and is affected by the physical, perceptual, social, and behavioral factors underlying the disease. By determining the presence of kinesiophobia and determining the relationship between the quality of life of individuals with chronic low back pain, it will be possible for

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individuals to participate in activities aimed at increasing their quality of life. Participation in appropriate physical activity will reduce the sedentary lifestyle and the risk factors that may occur in the future [4].

Within the scope of this research, we aimed to elucidate pain, sleep quality, quality of life, and kinesiophobia levels in patients with lumbar disc herniation and to determine their relationship with depressive symptoms. In this context, the hypothesis of this research are as follows: There is a significant relationship between the pain severity, sleep pattern, quality of life, and level of kinesiophobia and depressive symptoms in patients with lumbar disc herniation.

Material and Methods

The data of 74 patients who applied to our institution between 01/01/2020 and 01/04/2023 with a diagnosis of lumbar disc herniation have been analyzed retrospectively. All procedures followed were by the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval was granted from our institution on 02/05/2023 with protocol number B.30.2.ATA.0.01.00/312. As this research was retrospective, no informed consent was obtained from participants.

The study consisted of 74 patients with lumbar disc herniation. Sociodemographic information form (SIF), Nottingham Health Profile (NHP), Tampa Kinesiophobia Scale (TKS), Pittsburgh Sleep Quality Index (PSQI), Beck Depression Scale (BDS), and Visual Analogue Scale (VAS) were applied to the participants in the study. Patients with and without depressive symptoms have been grouped according to the BDS (Beck Depression Scale).

Inclusion and exclusion criteria

In this study, we will include patients who have been diagnosed with a herniated disc based on lumbar MRI imaging. These patients will represent individuals who have received a clear diagnosis of herniated intervertebral discs. However, we will exclude patients who do not meet the following criteria from the study: “Those who have not been diagnosed with a herniated disc based on lumbar MRI imaging.” This criterion has been used in the inclusion and exclusion processes of the study.

Statistical analysis

Patient data collected within the scope of the study were analyzed with the IBM Statistical Package for the Social Sciences (SPSS) for Macos 29.0 (IBM Corp., Armonk, NY) package program. Frequency and percentage were given for categorical data, and mean, standard deviation, median, minimum, and maximum descriptive values were given for continuous data. The normality test of the variables was evaluated with the Kolmogorov-Smirnov test. In the comparisons between the groups, the "Independent Sample T-Test" was used for the variables showing normal distribution for the two groups, the "Mann Whitney

U-Test" for the variables not showing normal distribution, and the "Chi-Square Test" was used for the comparison of categorical variables. "Spearman's Correlation Analysis" was used to examine the relationship between continuous variables. The results were considered statistically significant when the p-value was less than 0.05.

Results

Within the scope of this research, 74 patients with lumbar disc herniation, 36.5% (n=27) male and 63.5% (n=47) female, were included in the analysis. The ages of the patients ranged from 23 to 84, with a mean age of 49 years. The distribution of demographic and clinical findings of the patients are denoted in Table 1.

Table 1. Distribution of demographic and clinical findings of patients			
Variables (N=74)	n (%)	Mean±SS	Median (Min-Max)
Age (years)		49±16 PM	50 (23-84)
Gender			
Male	27 (36.5)		
Female	47 (63.5)		
VAS		5.8±2.5	6 (1-9)
TAMPA		41.6±9.6	42 (17-64)
Pittsburgh		5.5±3.2	6 (0-13)
Beck Depression Sclae (BDS)		12.4±11.9	10 (0-46)
NSP (pain)		60±35.3	66.4 (0-100)
NSP (emotion)		23.6±32.4	10.1 (0-100)
NSP (sleep)		29±31	12.6 (0-100)
NSP (social)		16.4±28.9	0 (0-100)
NSP (physical)		39±27.9	41.9 (0-100)
NSP (energy)		50.1±42.6	60.8 (0-100)
NSP-1		218±159.5	205 (0-564.9)
NSP-2		2.3±2.2	2 (0-7)
LIKE		9.6±0.5	9.6 (8.2-10.8)
Mg		1.9±0.2	1.9 (1.3-2.6)
Vitamin D		16.3±8.2	14.8 (6.3-42.5)
Uric acid		5±1.3	4.9 (2.7-8.9)
Sedimentation		11.4±10.4	7 (2-42)
Vitamin B12		394.2±174.4	363.5 (3.2-1251)
CRP		5.3±4.7	3.3 (1.8-32.8)

Beck depression scale scores of the patients ranged from 0 to 46, with a mean score of 12.4. A Beck depression scale score between 0 and 9 indicates minimal depression, 10–16 indicates mild depression, 17–29 indicates moderate, and 30–63 indicates severe depression. Regarding this scoring system, patients' scores <16 were classified as having no depression and ≥16 as having depression.

The demographic and clinical findings of the study population were evaluated according to the development of depressive symptoms (Table 2).

Table 2. Distribution of demographic and clinical findings of patients according to depression status

Variables	No depression (n=56)			Depression (n=18)			p-value
	n (%)	Average±SS	Median (Min-Max)	n (%)	Average±SS	Median (Min-Max)	
Age (years)		48±16 PM	46 (24-84)		52±17	56 (23-77)	0.417
Gender							0.970
Male	21 (37.5)			6 (33.3)			
Female	35 (62.5)			12 (66.7)			
VAS		5.4±2.5	6 (1-9)		6.9±1.9	8 (2-9)	0.024
TAMPA		39.5±9.5	41 (17-60)		48.1±6.3	48.5 (35-64)	<0.001
Pittsburgh		4.7±3	5 (0-13)		8.1±2.5	9 (3-11)	<0.001
NSP (pain)		56.6±35.5	59.4 (0-100)		70.8±33.6	79.5 (0-100)	0.090
NSP (emotion)		12.7±22.3	0 (0-100)		57.5±35.9	68.1 (0-100)	<0.001
NSP (sleep)		20.6±27.8	12.6 (0-100)		55±26.2	65.1 (0-77.6)	<0.001
NSP (social)		7.6±20.4	0 (0-100)		43.7±34.3	38.2 (0-100)	<0.001
NSP (physical)		33.4±25.3	38.2 (0-88.5)		56.3±29.1	55.6 (0-100)	0.004
NSP (energy)		39.9±40.5	30.4 (0-100)		81.6±33	100 (0-100)	<0.001
NSP-1		170.8±132.6	156.4 (0-564.9)		365±148.9	388.2 (0-557.5)	<0.001
NSP-2		1.8±2	1 (0-6)		3.7±2.4	3.5 (0-7)	0.003
LIKE		9.6±0.6	9.6 (8.2-10.8)		9.7±0.3	9.7 (9.1-10.2)	0.386
Mg		1.9±0.2	15.3 (6.3-42.5)		1.9±0.2	1.9 (1.6-2.3)	0.833
Vitamin D		16.9±8.4	15.3 (6.3-42.5)		14.5±7.3	11.4 (7.7-30.6)	0.217
Uric acid		4.8±1.2	4.8 (2.7-7.7)		5.5±1.6	5.1 (2.9-8.9)	0.050
Sedimentation		0.6±10.2	7 (2-42)		13.8±11.1	13.8±11.1	0.204
Vitamin B12		389.2±155.4	369 (3.2-832)		409.6±228.3	409.6±228.3	0.610
CRP		5±4.6	3.3 (1.8-32.8)		6.3±4.8	6.3±4.8	0.164

When the table is examined, it was determined that there was a statistically significant difference between the groups in the VAS pain severity, TAMPA, Pittsburgh sleep quality scale, 1, 2 in the NSP scale, and the sub-dimensions of emotion, sleep, social, physical and energy ($p<0.05$). All scale scores of patients with depressive symptoms were higher than those without depressive symptoms.

The results of the correlation analysis evaluating the relationship between the patients' BDS scale scores and other scale scores are elaborated in Table 3.

As a result of the significant relationship between the variables, a positive correlation coefficient indicates a positive linear relationship between the variables and a negative linear relationship between the variables. The value ranges of the correlation coefficient are expressed as follows;

Correlation coefficient

- Weak about being between 0.00-0.29,
- Between 0.30 and 0.49, the relationship between the two variables is low,
- Between 0.50 and 0.69, the relationship between the two variables is medium,
- Between 0.70 and 0.89, the relationship between the two variables is strong and
- Being between 0.90 and 1.00 indicates that the relationship between the two variables is very strong.

When the table was examined, it was seen that there was a statistically significant relationship between BDS scores and all scale scores ($p<0.05$). The patients' BDS scale score and VAS pain severity, TAMPA, NSP (pain), and NSP (physical) scale scores were low, Pittsburgh, NSP (emotion), NSP (sleep), NSP (social), NSP (energy), NSP 1. It was observed that there was a moderate relationship between the 2 scale scores.

Table 3. Examination of the relationship between Beck Depression Index (BDI) Scale scores and other scale scores of patients

Spearman's correlation		BDS
VAS	Correlation coefficient	0.327
	p-value	0.004
TAMPA	Correlation coefficient	0.431
	p-value	<0.001
Pittsburgh	Correlation coefficient	0.566
	p-value	<0.001
NSP (pain)	Correlation coefficient	0.364
	p-value	0.001
NSP (emotion)	Correlation coefficient	0.673
	p-value	<0.001
NSP (sleep)	Correlation coefficient	0.601
	p-value	<0.001
NSP (social)	Correlation coefficient	0.591
	p-value	<0.001
NSP (physical)	Correlation coefficient	0.408
	p-value	<0.001
NSP (energy)	Correlation coefficient	0.615
	p-value	<0.001
NSP-1	Correlation coefficient	0.650
	p-value	<0.001
NSP-2	Correlation coefficient	0.569
	p-value	<0.001

Discussion

Anxiety and depressive symptoms can occur in addition to chronic diseases and are seen at a rate of 5.8% in normal individuals without any additional disease. However, it is known to occur more frequently in those with physical disorders and affects life. In patients with chronic low back pain, fear of pain is associated with loss of physical performance and increased disability. Especially in patients with active work life, a fear-avoidance attitude is directly related to job loss due to chronic low back pain [5]. Swinkels-Meewisse et al. [6] reported no relationship between fear-avoidance attitude and pain severity in the patient group who did not have an active work life. Kovacs et al. [7] indicated that there is a relationship between the severity of pain, the level of disability, and the quality of life. Şengül [8] found a relationship between pain severity and quality of life, and it was reported that negative thoughts reduce patients' quality of life. The quality of life in patients with chronic low back pain is affected to varying degrees depending on the presence of emotional factors such as anxiety, depressive symptoms, and negative thoughts, a worsening in quality of life is observed.

The pain, anxiety, and movement limitation experienced by patients known to experience moderate anxiety and depressive symptoms before LDH surgery lead to depressive moods and negatively affect their quality of life. According to the fear-avoidance model, individuals with a negative experience with

pain interpret pain as a health threat. Pain experience can lead to an increase in the patient's addiction, creating a cycle that facilitates the development of anxiety and depressive symptoms. In general, it is known that depressive symptoms, anxiety, pain avoidance, and passive coping have negative effects on LDH surgery. It was determined that patients with LDH experienced the most low back and leg pain before surgery. In patients with pain, fear due to psychosocial and spinal problems may increase disability. Obstacles and movement restrictions caused by the pain experienced by people in their daily living activities negatively affect their quality of life. Therefore, pain management is important to lie down, get out of bed, turn over in bed as a whole, and use the right body mechanics. The study of Sagheer et al. determined that individuals with chronic low back pain are at high risk for anxiety and depressive symptoms [9]. According to Uluğ and Yılmaz, in individuals with long-term low back pain, symptoms of depressive symptoms often accompany the pain [10].

Inadequate pain management in patients with LDH may lead to the development of chronic pain, and failure to evaluate psychological risk factors may lead to increased anxiety and depressive symptoms. Wahlman et al.'s study also supports the relationship between pain, anxiety, and depressive symptoms before and after surgery [11].

Patient satisfaction is increasingly used as a quality indicator. Studies by Adogwa et al. elaborated that the degree of depressive symptoms before surgery influenced reported patient satisfaction after lumbar surgery, regardless of surgical efficacy. Screening measures to detect and treat symptoms of depressive symptoms in the perioperative period may contribute to better clinical outcomes and increased patient satisfaction [12]. Insufficient evaluation and treatment of pain, anxiety, and depressive symptoms can lead to worsening the disease, an increase in healthcare costs, and a decrease in quality of life. Pain management, protection of the spine, maintaining appropriate body mechanics and exercises and daily living activities, increasing the quality of life; meeting their information needs and answering their questions; Increasing their independence, informing them that recovery will take time, but it is possible, and giving examples of patients who have a similar process but recover over time can help prevent their depressive symptoms [13].

Gugliotta et al. compared surgical and conservative treatment in terms of short-term and long-term effects on low back pain, functionality, and quality of life in patients diagnosed with lumbar disc herniation. According to the results of this study, low back pain symptoms decreased more in the early period in the surgical group, and a parallel increase in functionality and quality of life was achieved. Regarding mid-term and long-term results, it has been reported that surgical treatment does not provide an advantage over conservative treatment. The acute period results of our study are consistent with the literature. In the early period, pain decreased, and functionality increased in individuals who underwent surgery [14]. Boskovic et al.

evaluated 50 patients with lumbar disc herniation who underwent a microdiscectomy regarding the quality of life [15], and unlike the article of Gugliotta et al, no significant increase in quality of life parameters in the early postoperative period, significant improvements in quality of life were noted in the evaluations at the 6th month after surgery have been observed [14,15].

This study determined a statistically significant relationship between Beck Depression Scale scores and all scale scores. Depressed patients have also expressed more pain in the Visual Analog Scale, Tampa Kinesiophobia Scale, and pain, physical, emotional, sleep), social, and energy sub-units of Nottingham Health Profile.

Conclusion

Regarding the outcomes of this research, one could say that depressive symptoms negatively affects sleeping patterns and the quality of life of patients with lumbar disc hernia.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from our institution. As this was a retrospective research no informed consent has been obtained from participants.

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