



# RELATIONSHIP BETWEEN DEPRESSION AND LOWER BACK PAIN AMONG PATIENTS AT THE UNIVERSITY OF NORTH SUMATRA HOSPITAL

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## Abstract

**Background:** Lower back pain (LBP) is a common health problem that can significantly impact the quality of life of an individual. Meanwhile, depression is a mental health disorder often associated with certain physical conditions. Several studies revealed a significant relationship between depression scores and LBP. Patients with more severe or prolonged LBP tend to have higher scores due to the psychological effects of chronic pain. Depression has also been shown to worsen LBP, where individuals with depressive symptoms are more prone to intense LBP. Psychological conditions, such as stress, anxiety, and depression, can increase the body's sensitivity to pain, thereby causing a decrease in the coping abilities of patients. In treating LBP, it is important to consider patients' psychological and mental factors, such as depression scores. Furthermore, effective care must include proper management of pain, as well as mental and emotional conditions. Understanding the relationship between depression scores and LBP can help healthcare professionals design appropriate and holistic patient therapeutic plans.

**Method:** This was a correlational analytic study with a cross-sectional approach, which analyzed the relationship between several independent and dependent variables using the PHQ-9 instrument. Furthermore, the participants were selected using consecutive non-probability sampling involving 150 LBP patients receiving treatment at the Neurology Outpatient Installation of USU Hospital in Medan. The data collected in this study were statistically analyzed using Spearman's correlation and Eta tests.

**Results:** This study found that age ( $p=0.001$ ,  $r=-0.267$ ), pain duration ( $p<0.001$ ,  $r=0.442$ ), and pain level ( $p<0.001$ ,  $r=0.448$ ) correlated with depression scores in LBP patients. Furthermore, gender ( $r=0.324$ ,  $F_{calc}=16.91$ ,  $F_{table}=3.91$ ) and smoking status ( $r=0.324$ ,  $F_{calc}=6.31$ ,  $F_{table}=3.91$ ) also correlated with depression scores.

**Conclusion:** Based on the results, there was a relationship between depression scores and LBP, highlighting the need for special attention in the treatment and education of this case.

## Introduction

Previous research has shown that low back pain (LBP) is a common symptom experienced by some individuals and is not a disease diagnosis. Furthermore, it is characterized by pain typically located in the lower rib corner and buttock fold. LBP is often accompanied by painful sensations in one or both legs, and some people may have neurological symptoms in the lower limbs. Pain originating from the lower back can be referred to other areas, or vice versa, and this situation is known as referred pain [1]. In developing countries, more than 70% of people have experienced LBP at some point. Reports also showed that 15% to 45% of adults had the condition, of which 5% received medical treatment for new episodes. Approximately 10% remain unemployed, while 20% have persistent symptoms for one year [2]. LBP is a complex condition caused by various factors, and psychosocial difficulties and psychological factors have been reported to be related. Although previous studies reported that excessive pain complaints were associated with psychological problems, the exact relationship between pain behaviour and psychology was still unclear [3].

Depression is a chronic mental disorder that can cause significant changes in an individual's mood, thoughts, behaviour, and physical health. Despite being a common condition, it is a severe illness that can affect a person's ability to enjoy life and decrease their capacity to perform even the simplest daily tasks. Furthermore, symptoms of depression that are associated with mental disorders often recur and pose a life-threatening risk [4,5]. According to data from the *World Health Organization* (WHO) in 2015, an estimated 4.4% of the world's population, or about 322 million people globally, experienced the condition. The prevalence of depression is higher in females, with a proportion of 5.1%, compared to 3.6% in males. The incidence rate of the condition has also been found to increase with age [6].

Depressive symptom is the most common mental health problem in LBP patients, and the prevalence is higher in people with chronic lower back pain (CLBP) compared to the general population. Large-scale studies in South Korea showed that the prevalence of depressive symptoms among LBP individuals was 20.3%, higher than the 4.5% among the general population. A longitudinal study in Spain also revealed that patients with chronic pain, such as CLBP, were 1.4 times more likely to be depressed than others. Furthermore, the presence of LBP and depressive symptoms can increase the risk of disability, decrease the quality of life, and incur higher medical costs. Based on a previous study, CLBP patients with severe depressive symptoms had a higher level of disability, which was caused by their depressed state [6].

Maladaptive responses to pain can exacerbate pain and impair the function of the body. This becomes a significant problem when individuals experience an exaggerated response, excessive distress, and helplessness, which are associated with lower treatment effectiveness and more significant disability. The occurrence of depression can reduce the ability of an individual to cope with pain in the body. Depression and chronic pain have been reported to be related to each other. This is because psychological distress and physical strain caused by persistent pain interacting with individual and social vulnerability can trigger severe depressive symptoms [7]. Therefore, this study aims to determine the relationship between depression and LBP among patients at the University of North Sumatra (USU) Hospital.

## Methods and Statistical Analysis

### Methods

This was a correlational analytical study with a cross-sectional approach, which analyzed the relationship between several independent variables and the dependent variable using the PHQ-9 instrument. Furthermore, the participants were selected using

the non-probability consecutive sampling, involving 150 LBP patients receiving treatment at the Neurology Outpatient Installation of USU Hospital in Medan.

### Statistical Analysis

Data analysis in this study was carried out using Microsoft Excel and the Statistical Package for the Social Sciences (SPSS) software. Furthermore, two types of analysis were used for the independent variables. The Spearman correlation and eta tests were performed for numerical and categorical variables, respectively.

### Result

The age variable had a median value (range) of 51.50 years (24-71 years), and the sample population consisted of 98 females (65.3%) and 52 males (34.7%). Furthermore, the median value (range) of pain duration was ten months (2-50 months), and the non-smoker status was more common with 101 patients (67.3%). The median value (range) of the pain level and depression score variables was 6 (3-7) and 9.50 (2-19), respectively, as shown in Table 1.

Based on the results, age ( $p= 0.001$ ,  $r= -0.267$ ), pain duration ( $p= <0.001$ ,  $r= 0.442$ ), and pain level ( $p= <0.001$ ,  $r= 0.448$ ) had a relationship with depression scores in LBP patients. Age showed a negative correlation, while pain duration and pain level correlated positively, as shown in Table 2. Gender ( $r= 0.324$ ,  $F_{count}= 16.91$ ,  $F_{table}= 3.91$ ) and smoking status ( $r= 0.324$ ,  $F_{count}= 6.31$ ,  $F_{table}= 3.91$ ) were also found to correlate with depression scores in this study, as shown in Table 3.

Table 1. Demographic Overview

Variable	Median (min-max)	n %
Age (Years)	51.50 (24-71)	
Gender		
-Male		52(34,7)
-Female		98(65,3)
Pain Duration (Month)	10 (2-50)	
Smoking Status		
-Smoke		49 (32,7)
-Do not smoke		101 (67,3)
Pain Level	6 (3-7)	
Depression Score	9,50 (2-19)	

Table 2. Bivariate analysis between numerical data variables and depression scores

Variable	n	r	p-value
Depression Score			
1. Age	150	-0,267	0,001
2. Pain Duration	150	0,442	<0,001*
3. Pain Level	150	0,448	<0,001*

\* Spearman's test

Table 3. Differences between categorical data variables and depression scores

Variable	n	p-value	OR
Depression Score			
1. Gender	Man 52	Women 98	<0,001 1.057 (0.763-2.674)

2.	Smoking Status	Smoke	Do not	<0,001	2.8567 (1.587-4.969)
		smoke	101		
		49			

\* Chi-square

## Discussion

This study showed a negative correlation between age and depression scores among LBP patients. This finding was consistent with previous studies in Japan, where a relationship was reported between age and CLBP. Similar results were also obtained by previous studies at other locations worldwide [8-10].

Based on the results, pain duration and intensity were found to have a moderate positive correlation with depression in LBP patients. This finding aligned with previous studies, which found similar relationships [11-14]. Furthermore, treatment for LBP often requires comprehensive management involving multidisciplinary therapy, such as neurology, psychiatry, and orthopaedics. Educating LBP patients could improve depressive symptoms, such as feelings of hopelessness toward treatment. Proper management could also have a positive impact in reducing the occurrence of depression.

This study also found a correlation between gender and smoking status. This was consistent with previous studies in Korea, where the prevalence of depression in females was higher than in males. Furthermore, there was a possibility that this was caused by the higher proportion of females in the sample population. The prevalence of depression and LBP was more dominant among females [10,15]. Smoking had been reported to increase depression symptoms, making it difficult to conclude that it had a positive effect. A previous study also revealed that smoking habits increased the severity of LBP. Clinicians must emphasize this to reduce and stop these habits [15,16].

## Conclusion

Based on the results, there was a relationship between depression scores and LBP. Individuals with more severe or prolonged LBP were observed to have higher depression scores. Meanwhile, depressive symptoms also could worsen LBP among patients. This indicated that attention must be paid to patients' psychological and mental factors, such as depression scores, during the treatment of LBP. Effective treatment should include appropriate management of pain and mental and emotional conditions.

## Ethics Approval and Consent to Participate

This study was approved by the Research Ethics Committee at the Faculty of Medicine, the University of North Sumatra (USU), with the letter number 681/KEP/USU/2022 on August 05, 2022. All participants had written and signed their consent to participate.

**Transparency Declaration.** Competing interests: None to declare.

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