



# Prediction of Musculoskeletal Pain through Depression and Psychological Capital

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## ABSTRACT

**Aims:** The relationship between chronic pain and depression has been argued in many studies. Previous documents have shown that psychological factors have a significant role in the adjustment to and coping with chronic pain. This research was done to assess if musculoskeletal pain could predict depression and psychological capital.

**Method and Materials:** This descriptive was done among 108 students of the psychology and counseling department of West Tehran Branch of Azad University in Tehran, Iran. These students began their studies in 2018. To collect data, the eligible student completed three standard questionnaires including Pain Intensity Assessment (VAS), MacGee's Psychological Capital Questionnaire and Beck depression questionnaire (2-BDI-II). The gathered data were entered into SPSS 24 and analyzed through descriptive and analytical tests.

**Findings:** The results of Pearson's correlation coefficient test and multiple regression analysis showed that there is a positive and direct relationship between depression and musculoskeletal pain ( $r=0.34$ ). This means that as depression increases in students, musculoskeletal pain also increases. Moreover, there is a negative and inverse correlation between psychological capital and musculoskeletal pain in the self-efficacy subscale with the lowest coefficient ( $r=-0.31$ ) and in the resilience subscale with the highest coefficient ( $r=-0.41$ ). This means that the weaker the psychological capitals, the more musculoskeletal pains. Furthermore, depression and psychological capital predict musculoskeletal pain in students.

**Conclusion:** This study revealed that to improve musculoskeletal pain, appropriate interventions to decrease depression and increase psychological capital should be done.

**Keywords:** Depression, Psychological Capital, Musculoskeletal Pain

## Introduction

The relationship between chronic pain and depression has been argued in many studies. Previous documents have shown that psychological factors have a significant role in the adjustment to and coping with chronic pain<sup>(1)</sup>. According to findings of many studies, beyond individual and physical factors, psychological factors interfere in causing chronic pain<sup>(2,3)</sup>. These studies verified that lower mental health level cause higher level of pain<sup>(4)</sup>. It has been argued that pain-depression comorbidity is related to worse clinical outcomes and more treatment costs. According to the existed studies majority of patients with depression experience pain, and many individuals with chronic pain suffer from depression<sup>(5)</sup>. The link between depression and pain is believed to be bidirectional.

Yet, this comorbidity is not clearly understood. However, the bidirectional relationship between depression and chronic pain is well-recognized, but their clinical management remains challenging<sup>(6)</sup>. Depressive symptoms are relatively common in female health care workers with Low Back Pain (LBP), and treatment of these symptoms may be crucial to improve their work ability<sup>(7)</sup>. On the other hand, it should be kept in mind that the main source of depression may be low psychological capital (PsyCap)<sup>(8)</sup>. Various researches have pointed out the effect of psychological capital components on mental health and the reduction of clinical symptoms of depression in people, which is an important explanation for reducing depression and plays an important role in the mental

health of social people<sup>(9)</sup>. Therefore, people who have low psychological capital act ineffectively against diseases and cannot manage negative emotional situations. Therefore they experience more negative emotions such as anxiety and depression<sup>(10)</sup>.

Psychological capital is a relatively large concept, with four dimensions self-efficacy, hope, optimism, and resilience, and so it is relatively easy to measure and quantify. PsyCap refers to a state of positive psychological development that an individual shows in the process of growth and development<sup>(11)</sup>. Psychological capital is believed to enhance college students' acceptance and enable them to better control their emotions, and reduce bad habits. The results of a longitudinal data from four years of Chinese college students show that the level of general self-efficacy plays a very important role in the probability of depression<sup>(11)</sup>. Since several studies have shown that students are one of the sections of the society that are exposed to musculoskeletal pain<sup>(1)</sup>, this study aimed to assess the relationship between PsyCap and depression among student in Azad university, Tehran west branch who suffers from low back pain.

### Method and Materials

In this cross section study, the studied statistical population included the counseling students who began their studies in the Tehran West branch of Azad University in 2018. In this study Morgan's table was used to calculate the sample size. There for, considering that the size of the statistical population which was 150 people, the minimum required sample size calculated as 108 people. To collect data, the following questionnaires were provided online to the eligible counseling students. SPSS-26 was used to analyze the data. The data were collected using three instruments:

**Visual Analog Scale (VAS):** In order to measure perceived pain intensity, a visual grading scale was used. This ruler is a 100 cm horizontal strip, one end of which is the number zero (no pain) and the other end is the number ten (the most severe possible pain). The mentioned ruler has both

qualitative and quantitative sides. The person was asked to mark the qualitative side of the ruler according to the amount of pain. Then the researcher turned the ruler and recorded that point as a number. The obtained number was considered as the patient's pain level. This scale was the most reliable pain grading system for comparison between different periods and is widely used in pain-related research, its validity and reliability have been confirmed in Karim's research (2004) and its reliability coefficient is equal to (0.91)<sup>(12)</sup>.

**MacGee's Psychological Capital Questionnaire:** To measure psychological capital, the twenty-six question questionnaire that was created and presented by McGee and his colleagues to measure the psychological capital of employees with four subscales of self-efficacy, hope, resilience and orientation to life was used. The options of answering the questions of this questionnaire are as follows: completely disagree 1, disagree 2, somewhat disagree 3, somewhat agree 4, agree 5 and completely agree 6. The self-efficacy subscale includes questions 1 to 7. Hope subscale includes questions 8 to 14. The resilience subscale includes questions 15 to 20. The optimism subscale includes questions 21 to 26. To obtain the score of psychological capital, first the score of each subscale was obtained separately and then their sum was considered as the total score of psychological capital. The face and content validity of this questionnaire were checked and confirmed by previous study<sup>(13)</sup>. Cronbach's alpha of self-efficacy, hope, resilience, and orientation to life were 0.91, 0.89, 0.83, and 0.70, respectively.<sup>(13)</sup>

**Beck Depression Questionnaire (2-BDI-II):** According this questionnaire, to grade the severity of the subject's depression, the following scores were used to show the overall level of depression: 0 to 13 (none or minimal depression), 14 to 19 (mild depression), 20 to 28 (moderate depression), and 29 to 63 (severe depression). – The reliability of this questionnaire in a sample of 94 people in Iran was as follows: Cronbach's alpha coefficient 0.91, correlation coefficient between the two halves of the test 0.89 and retest coefficient 0.94<sup>(14)</sup>. In order to measure

the reliability of the beck depression questionnaire, a high-level analysis of various attempts to determine internal consistency has shown that the obtained coefficients ranged from 0.73 to 0.92 with an average of 0.86. The convergent validity of the 21-question beck depression questionnaire was obtained through its simultaneous implementation with the Beck Hopelessness Scale (1988), the Suicidal Thoughts Scale (1979), and the Beck Anxiety Inventory (1993) as 0.68, 0.37, and 0.60, respectively. (15). The correlation coefficient of the Beck depression questionnaire with the Hamilton psychiatric rating scale for depression is 0.73 and with the MMPI depression scale is 0.74 (16) It should be noted that in line with how to collect data; All the questionnaires were done through press line.

In the current research, data analysis was

done through descriptive and analytical statistics: In the descriptive statistics section, all demographic information such as gender, ages were described. Through index of descriptive statistics like frequency, mean, standard deviation. In the analytical statistics section, all the research hypotheses were analyzed using spss software, and thus the research hypotheses were rejected or confirmed using multiple regression and Pearson's tests.

**Findings**

In this study 108 students including 99 (% 91.7) female students and 9 (% 8.3) mail students were studied. Among all students, 51(%47.2) were married and 57(%52.8) were single. The rest of demographic variables were shown in Table 1.

**Table 1)** Table1- Demographic variables of the studied students

Variables	
<b>Age (N=108)</b>	N(%)
≤30 years	57 (52.8)
30-40 years	16 (14.8)
≥ 40 years	35 (32.4)
<b>Gender</b>	
Female students	99 (91.7)
Male students	9 (8.3)
<b>Field of study(N=108)</b>	
Counseling	79 (73.1)
Psychology	22 (20.4)
Other disciplines	7 (6.5)
<b>Academic degree(N=108)</b>	
Bachelor degree	105(97.2)
Ph.D	2 (1.9)
<b>Job (N=108)</b>	
Housekeeper	26 (24.1)
Employee	30 (27.8)
retireRetired	2 (1.9)
Jobless	50(46.3)
<b>Acute illness (N=108)</b>	
Yes	12 (11.1)
No	96 (88.9)

**Table 2)** Mean scores of psychological capital subscales of studied students

Variable	Number	Mean ± SD	Range of Changes subscale
Depression	108	13.58±10.25	1-43
Self-efficacy	108	33.11±6.41	15-42
Hope	108	30.44±6.32	14-42
Resilience	108	26.03±4.54	16-36
Optimism	108	25.82±5.34	7-36
Pain severity	108	2.82±2.82	0-9

**Table 3)** The correlation of psychological capital subscales of studied students with depression and musculoskeletal pain.

Variable	Depression	
	Pearson correlation coefficient	P value
Self-efficacy	0.782-	<0.001
Hope	0.681-	<0.001
Resilience	0.728-	<0.001
Optimism	0.709-	<0.001
Variable	Musculoskeletal pains	
	Pearson correlation coefficient	Pvalue
Self-efficacy	0.305-	<0.001
Hope	0.372-	<0.001
Resilience	0.406-	<0.001
Optimism	0.327-	<0.001

**Table 4)** Correlation between depression and musculoskeletal pain.

Variable	Musculoskeletal pains	
	Pearson correlation coefficient	P.Value
Depression	0.336	0.001

The mean score of psychological capital subscales were shown in Table 2. This study showed psychological capital subscales of studied students were correlated with depression and musculoskeletal pain. Table 3 shows these correlations. Moreover, this study revealed that depression was correlated with musculoskeletal pain significantly (Table4)

**Discussion**

The aim of the present study was to predict musculoskeletal pain through depression and psychological capital in students of West Tehran branch of Islamic Azad University. The results of Pearson's correlation coefficient test and multiple regression analysis showed that there is a positive and direct relationship between depression and musculoskeletal pain. This means that as depression increases in students, musculoskeletal pain also increases. Furthermore, there was a negative and inverse correlation between self-efficacy as subscale of psychological capital and musculoskeletal pain and also a negative and inverse correlation between resilience subscale and musculoskeletal pain. This means that the weaker psychological capitals (in subscales of self-efficacy and resilience), the more musculoskeletal pains. In addition, depression and lower psychological capital predicted musculoskeletal pain in students. These results are consistent with the findings of Liu et al., 2024; Sánchez-Rodríguez et al.,

2020; Daliri et al,2022; Liu, et al.2024; Song and Sang, 2024; Sheikhzade et al., 2021; were consistent<sup>(17-22)</sup>.

In explaining these findings, it can be said that there is a complex relationship between depression and musculoskeletal pain, which is influenced by biochemical, inflammatory, behavioral and psychological factors. Understanding this connection can help develop more effective interventions to manage these problems. Recent studies have shown that psychological factors, including depression and psychological capital, can play an important role in these pains. According to existed research, people who have symptoms of depression are more likely to experience chronic pain <sup>(23)</sup>. This relationship can be due to the disturbance in the biochemical and psychological processes that exist in student depression <sup>(24)</sup>. Depression is associated with biochemical changes in the brain that can affect pain perception. Changes in the level of neurotransmitters such as serotonin and norepinephrine can lead to increased sensitivity to pain. These changes may cause the person to feel more intense pain or feel discomfort continuously. Research also shows that depression is associated with systemic inflammation. Inflammation can contribute to tissue damage and increased pain sensation. A study has shown that people with depression usually have higher levels of inflammatory markers that can lead to chronic pain <sup>(25)</sup>, which is related to the findings of the present

research. Depression may lead to changes in daily behaviors such as reduced physical activity and changes in sleep patterns. These changes can lead to muscle weakness and increase the likelihood of musculoskeletal pain <sup>(26)</sup>. In addition, people with depression may have less desire to exercise and physical activities due to feeling tired and lack of energy, so they experience more pain. Anxiety and stress, which are commonly associated with depression, can exacerbate pain. Psychological reactions to stress can lead to an increase in muscle tension, resulting in musculoskeletal pain <sup>(27)</sup>. In this regard, studies have shown that psychological exercises such as mindfulness can help improve the state of depression and reduce related pain in people with musculoskeletal pain.

On the other hand, the present research has shown a negative significant relationship between psychological capital and musculoskeletal pain. Studies have shown that increasing psychological capital can reduce symptoms of depression and improve the quality of life of people with musculoskeletal pain <sup>(19)</sup>. Understanding these relationships can lead to development of more effective intervention strategies for people who face these challenges. Psychological capital includes elements such as hope; self-efficacy, resilience, and optimism that can help people better manage pain and reduce negative emotions. Social capital with the help of relationships, networks and social interactions can have positive effects on individual and social health. In the field of musculoskeletal pain management, social capital and its components, including trust, social interactions, social support, etc., have important effects. People who have emotional and practical support from family, friends and society feel less lonely and stressed. Research has shown that social support can reduce the sensation of pain and help improve the quality of life of patients with chronic pain <sup>(27)</sup>. Positive interactions with others can help reduce feelings of loneliness and depression. People who are in stronger social networks usually participating more in social and sports activities. These activities not only help to

improve the physical condition, but can also lead to a reduction in the feeling of pain <sup>(28)</sup>. Trusting others and feeling safe in social relationships can have a positive effect on mental health. People with high levels of social trust experience less anxiety and stress, which in turn can lead to a reduction in physical pain, especially in cases of chronic musculoskeletal pain. Social capital also helps student's access health care resources and services. People who are in active social networks are more likely to benefit from medical services and consultations. This access to resources can play an important role in managing and reducing musculoskeletal pain. Moreover, groups and social networks can encourage people to participate in physical activities. Sports and social activities can help reduce pain and improve physical performance. One study has shown that people who exercise in a group experience greater pain reduction than those who exercise alone <sup>(25)</sup>. Social capital and its components can help reduce musculoskeletal pain in different ways. From social support to positive interactions and access to resources, all of these factors can help improve the quality of life of people with chronic pain <sup>(27)</sup>.

This research, like other researches, has faced limitations. The limitations is related to the statistical population of this research who are students of West Tehran Azad University and also the type of research which is descriptive study. These limitations could interfere in generalizations, interpretations and etiological aspects of the studied variables that should be considered. In addition, the possible problems related to the research implementation process in this study should not be overlooked. However, the findings of this study could help to improve educational programs and psychological/ counseling workshops by the professionals and administrators who can help students to increase their psychological capital and to identify and manage the symptoms of depression and in this way, improve the quality of resilience and reduce their skeletal pain.



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## Conflict of Interest

There is no conflict of interest for this study.

## Ethical Permission

This article is taken from the bachelor's thesis of the first author of the article that was approved in Tehran west branch of Azad University.

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