**Prediction of musculoskeletal pain through depression and psychological capital**

***Authors***

**1-**

**Atefeh Bolouani ; Ms , Department of Psychology and**

**Counseling. Faculty of Humanity and**

**Management Sciences, West Tehran**

**Branch, Azad University, Tehran, Iran.**

**Email: nabloorani@gmail.com**

**2-**

**Sima Ghodrati ; Phd ; Psychology and**

**Counseling**

**Address: Department of Psychology**

**and Counseling. Faculty of Humanity**

**and Management Sciences, West Tehran**

**Branch, Azad University, Tehran, Iran.**

**P.O.Box: 1468763785**

**Tel: +98 21 88385771-80**

**Fax: +98 21 26602642**

**Email: sima.ghodrati17@yahoo.com**

**3-**

**Jamshid Jarareh ; Phd ; Address: Department of Psychology**

**and Counseling. Faculty of Humanity**

**and Management Sciences, West Tehran**

**Branch, Azad University, Tehran, Iran.**

**Email: jararehj@gmail.com**

# Abstract

**Aim:** This research has been done with the aim of " Prediction of musculoskeletal pain through depression and psychological capital",

**Method and Material:** so the research method of this paper is descriptive survey in terms of purpose, applied in terms of results, quantitative in terms of research process and cross-sectional in terms of time. The statistical population of this research includes the students of the counseling department of Tehran Azad University, west of Tehran, entry 1398 . and based on Morgan's table, 108 people were selected by simple random sampling and answered the questionnaire. The validity of the questionnaire was confirmed by the opinions of experts and its reliability was confirmed by Cronbach's alpha method. The research hypotheses were tested by partial least squares method using spss software.

**Finding:** The results of the analyzes showed that there is a relationship between depression and psychological capital with musculoskeletal pain. There is a relationship between depression and psychological capital. Also, depression and psychological capital predict musculoskeletal pain.

**Conclusion:** 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=.34). This means that as depression increases in students, musculoskeletal pain also increases. Also, there is a negative and inverse correlation between psychological capital and musculoskeletal pain in the self-efficacy subscale with the lowest coefficient (r=-.31) and in the resilience subscale with the highest coefficient (r=-.41). This means that the weaker the psychological capitals, the more musculoskeletal pains. Also, depression and psychological capital predict musculoskeletal pain in students.

**Key words**: 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 (1). According to findings of many studies, beyond individual and physical factors, psychological factors interfere in causing chronic pain (2,3). These studies verified that lower mental health level cause higher level of pain (4)

It has been argued that pain-depression comorbidity is related to worse clinical outcomes and more treatment costs. According the existed studies majority of patients with depression experience pain, and many individuals with chronic pain suffer from depression (5).

The link between depression and pain is believed to be bidirectional. Yet, why comorbidity occurs is not clearly understood. The bidirectional relationship between depression and chronic pain is well-recognized, but their clinical management remains challenging (6)

Depressive symptoms are relatively common in female health care workers with Low Back Pain, and treatment of these symptoms may be crucial to improve their work ability (7).

On the other hand, it should be kept in mind that the main source of depression may be low psychological capital(PsyCap) (8).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 (9). 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 (10).

Psychological capital is a relatively large concept, with four dimensions (self-efficacy, hope, optimism, and resilience), and 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(11) PsyCap 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 also show that the level of general self-efficacy plays a very important role in the probability of depression (11). Since several studies have shown that students are one of the sections of the society that are exposed to musculoskeletal pain (1). Therefore this study aimed to assess the relationship between PsyCap and depression among student among students who suffers from low back pain.

**Method**

This was a descriptive correlational study. The statistical population of this study included the counseling students Entry 2018 year of West Tehran Azad University. Morgan's table was used to calculate the sample size. Therefore, considering that the size of the statistical population is 150 people, the minimum required sample size is 108 people. The sampling method in this research is available sampling method. In this regard, the questionnaire was provided online to counseling students of Tehran West Azad University. data analysis, SPSS-26 was usde.

The data were collected using three instruments:

**Pain Intensity Assessment (VAS):** In order to measure perceived pain intensity, a visual grading scale was used. This ruler is a 54 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 Karimi's research (2004) and its reliability coefficient is equal to (0.91))12).

**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 is used. . The scale of answering the questions of this questionnaire is as follows: completely disagree 1, disagree 2, somewhat disagree 3, somewhat agree 4, agree 5 and completely agree. 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 is obtained separately and then their sum is considered as the total score of psychological capital. he face and content validity of this questionnaire was checked and confirmed by Tenni Chand of experts in Golparvar et al.'s research in 2012 In Iran, exploratory factor analysis with varimax rotation on twenty-six questions of this questionnaire, the same four factors were introduced by McGee 2011 in the translated Persian version, and Cronbach's alpha was obtained for self-efficacy, hope, resilience and orientation to Lives equal to 0.88, 0.86, 0.83 and 0.83 were obtained. In Golparor et al.'s research in 2012, Cronbach's alpha of self-efficacy, hope, resilience, and orientation to life was 0.91, 0.89, 0.83, and 0.70, respectively.(13)

**Beck depression questionnaire (2-BDI-II):**

To grade the severity of the subject's depression, the following scores can be used to show the overall level of depression: 0 to 13 (none or minimal depression), 14 to 19 (mild depression), 20 to 28 (depression). moderate) and 29 to 63 (severe depression) (14). – 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 (15).

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 (14). 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. (16). lso, 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 (17).

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 is divided into two parts: descriptive statistics and inferential statistics: In the descriptive statistics section, all demographic information such as gender, age were described. (Index of descriptive statistics, frequency, mean, standard deviation...) In the inferential 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 test.

|  |  |  |  |
| --- | --- | --- | --- |
| **average** | **Abundance percentage** | **Absolute abundance** | **age** |
| 32/43 | 52.8 | 57 | Under 30 years |
| 14.8 | 16 | 30 years to 40 |
| 32.4 | 35 | Older than 40 years |
| 100.0 | 108 | the whole |

|  |  |  |
| --- | --- | --- |
| **gender** | **Absolute abundance** | **percentage** |
| woman | 99 | 91.7 |
| the man | 9 | 8.3 |
| the whole | 108 | 100.0 |
| **Field of study​** | **Absolute abundance** | **Abundance percentage** |
| Counseling | 79 | 73.1 |
| Psychology | 22 | 20.4 |
| Other disciplines | 7 | 6.5 |
| the whole | 108 | 100.0 |
| **lot assessment​** | **Absolute abundance** | **percentage** |
| bachelor | 105 | 97.2 |
| Master's degree | 2 | 1.9 |
| Ph.D | 1 | 9 |
| the whole | 108 | 100.0 |
| **marital status​​** | **Absolute abundance** | **Abundance percentage** |
| married | 51 | 47.2 |
| single | 57 | 52.8 |
| the whole | 108 | 100.0 |
| **job** | **Absolute abundance** | **Abundance percentage** |
| housekeeper | 26 | 24.1 |
| employed | 30 | 27.8 |
| retired | 2 | 1.9 |
| student | 50 | 46.3 |
| the whole | 108 | 100.0 |
| **Acute illness​​​** | **Absolute abundance** | **Abundance percentage** |
| yes | 12 | 11.1 |
| no | 96 | 88.9 |
| the whole | 108 | 100.0 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** |  | | | **Dispersion tendency indices** | | | | |
| Number | average | the middle | range of changes | variance | standard deviation | minimum | maximum |
| depression | 108 | 13.58 | 9 | 42 | 110.25 | 10.50 | 1 | 43 |
| self-efficacy | 108 | 33.11 | 34 | 27 | 41.07 | 6.41 | 15 | 42 |
| hope | 108 | 30.44 | 31 | 28 | 39.93 | 6.32 | 14 | 42 |
| Resilience | 108 | 26.03 | 26 | 20 | 20.61 | 4.54 | 16 | 36 |
| optimism | 108 | 25.82 | 26 | 29 | 28.46 | 5.34 | 7 | 36 |
| the pain | 108 | 2.82 | 3 | 9 | 3.380 | 2.82 | 0 | 9 |

|  |  |  |
| --- | --- | --- |
| **Variable** | **depression** | |
| **Pearson correlation coefficient** | **level of significance** |
| 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** | **level of significance** |
| self-efficacy | 0/305- | 0/001 |
| hope | 0/372- | 0/001> |
| Resilience | 0/406- | 0/001> |
| Optimism | 0/327- | 0/001 |
| **Variable** | **Musculoskeletal pains** | |
| **Pearson correlation coefficient** | **level of significance** |
| depression | 0/336 | 0/001> |

**Discussion and conclusion**

The aim of the present study was to predict musculoskeletal pain through depression and psychological capital in students of West Tehran 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 (r=.34). This means that as depression increases in students, musculoskeletal pain also increases. Also, there is a negative and inverse correlation between psychological capital and musculoskeletal pain in the self-efficacy subscale with the lowest coefficient (r=-.31) and in the resilience subscale with the highest coefficient (r=-.41). This means that the weaker the psychological capitals, the more musculoskeletal pains. Also, depression and psychological capital predict musculoskeletal pain in students with ... and ... respectively.

These results are 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(18-23).

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 treatments 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 research, people who have symptoms of depression are more likely to experience chronic pain (24). This relationship can be due to the disturbance in the biochemical and psychological processes that exist in student depression (25). . 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 (26), 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 (27). 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 (28). 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 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 (20). Understanding these relationships can lead to the development of more effective treatment strategies for people who face these challenges. to help 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 (28). Positive interactions with others can help reduce feelings of loneliness and depression. People who are in stronger social networks usually participate 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 (29). 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 students 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. Also, 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 (26). 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(28). This research, like other researches, has faced limitations. The limitations related to the statistical population of the research (students of West Tehran Azad University) and the type of research (descriptive) raise limitations in the field of generalizations, interpretations and etiological documents 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. Educational programs and psychological and counseling workshops by university planners and administrators can help students to increase these characteristics and psychological capital and to identify and manage the symptoms of depression, and in this way, improve the quality of resilience and reduce skeletal pain and Aim for muscularity. Acknowledgment: We would like to sincerely appreciate and thank all the participating students, professors, staff and deans of the relevant university faculties who cooperated in the implementation of this research. Sponsor: This article is taken from the bachelor's thesis of the first author of the article and has no financial sponsor. Conflict of interest: This article has no conflict of interest.

**Reference**

1. Ghanbary Sartang A, Ashnagar M, Habibi E, Rezaei N. Relationship between Anxiety and Depression with Musculoskeletal Disorders in Military Personnel. MCS. 2017; 4 (2) :95-101. URL: <http://mcs.ajaums.ac.ir/article-1-172-fa.html>
2. Tehranizadeh M, Raiisi F. Thw relationships between Depression, Pain Self-Efficacy, Physical Disability and Chronic Pain. IJMPP. 2020; 5[3]: 373-379.
3. Zheng CJ, Van Drunen S, Egorova-Brumley N. Neural correlates of co-occurring pain and depression: an activation-likelihood estimation (ALE) meta-analysis and systematic review. Translational Psychiatry. 2022 ;11;12(1):196.
4. Navabian Ghamsari MH, Goodarzi A, Torabi A. Prevalence of Low Back Pain and Its Association with Depression in Male and Female Employees in Iran. IJMPP.2019 ;10;4(3):234-40.
5. Bair MJ, Robinson RL, Katon W, Kroenke K. Depression and pain comorbidity: a literature review. Arch Intern Med. 2003; 10;163(20):2433-45. doi: 10.1001/archinte.163.20.2433. PMID: 14609780.
6. Roughan WH, Campos AI, García-Marín LM, Cuéllar-Partida G, Lupton MK, Hickie IB, Medland SE, Wray NR, Byrne EM, Ngo TT, Martin NG. Comorbid chronic pain and depression: shared risk factors and differential antidepressant effectiveness. Front. physiol.: 2021 ; 12;12:643609.
7. Virkkunen T, Husu P, Tokola K, Parkkari J, Kankaanpää M. Depressive symptoms are associated with decreased quality of life and work ability in currently working health care workers with recurrent low back pain .JOEM.. 2022 ; 1;64(9):782-7.
8. Song R, Song L. The relation between psychological capital and depression: a meta-analysisCurr. Psycho: 2024;43(20):18056-64.
9. Azad Manjiri, Mohammad. Nameni, Ibrahim. The moderating role of empathy in the relationship between psychological capital and depression and anxiety in nurses. JSUMS. 2017;27(3) : 463-473
10. Jafari A. Comparison of cognitive flexibility, psychological capital and pain coping strategies between responders and non-responders to home treatment with covid-19. CONS. 2019;19(73):4-35.
11. Liu X, Wang Z, Zhang C, Xu J, Shen Z, Peng L, Mi Y, Xu H. Psychological Capital and Its Factors as Mediators Between Interpersonal Sensitivity and Depressive Symptoms Among Chinese Undergraduates. Psychol Res Behav Manag. 2024 ; 31:429-41.
12. Karimi A. *A prospective study of the outcome of treatment of chronic low back pain patients with consistent and inconsistent clinical signs as defined by three screening tests* (Doctoral dissertation, University of East Anglia).
13. Golparvar M, Jafari M. Prediction of psychological capital through components of spirituality among nurses. Iranian journal of psychiatric nursing. 2013 ;10;1(3):35-44.
14. Marnath GG. Psychological assessment guide for clinical psychologists, counselors, and psychiatrists. Translated by Hassan Pasha Sharifi and Mohammad Reza Nikkhah.2004:390.
15. Fata Laden, Birshak Behrouz, Atef Vahid Mohammad Kazem, Dobson Keith Stephen. Meaningful structures/schemas, emotional states and cognitive processing of emotional information: comparison of two conceptual frameworks. Indian J. Psychiatry (thought and behavior) [Internet]. 2004;11(3 ) 42 consecutive :312-326. Available from: https://sid.ir/paper/16583/fa
16. Beck AT, Steer RA, Ball R, Ranieri WF. Comparison of Beck Depression Inventories-IA and-II in psychiatric outpatients. **J. Pers. Assess**. 1996 Dec 1;67(3):588-97.
17. Sharifi Awadi, Parviz, Ghasemi Davari, Leila. Comparison of emotional insight, self-esteem and depression in abused and non-abused girls aged 15 to 18 in Tehran in 2018-2019. (JPE), 2013; 2(7): 115-132.
18. Liu S, Zhang X, You B, Jiang G, Chen H, Jackson T. Pain Catastrophizing Dimensions Mediate the Relationship between Chronic Pain Severity and Depression. Pain Management Nursing. 2024 ;1;25(1):4-10.
19. Sánchez-Rodríguez E, Aragonès E, Jensen MP, Tomé-Pires C, Rambla C, López-Cortacans G, Miró J. The role of pain-related cognitions in the relationship between pain severity, depression, and pain interference in a sample of primary care patients with both chronic pain and depression. Pain Manag. 2020;21(10):2200-11.
20. Daliri R, Fattahi Andabil A, Dokaneifard F. Prediction of mental (psychological) pain based on psychological capital among people with grief experience because of Coronavirus: The mediating role of social support of women. AFTJ. 2022 ;20;2(Covid-19 articles collection)):229-45.
21. Liu X, Wang Z, Zhang C, Xu J, Shen Z, Peng L, Mi Y, Xu H. Psychological Capital and Its Factors as Mediators Between Interpersonal Sensitivity and Depressive Symptoms Among Chinese Undergraduates. Psychol Res Behav Manag. 2024 ; 31:429-41.
22. Song R, Song L. The relation between psychological capital and depression: a meta-analysis. Curr. Psychol. Rev. 2024 May;43(20):18056-64.
23. Sheikhzadeh A, Wertli MM, Weiner SS, Rasmussen-Barr E, Weiser S. Do psychological factors affect outcomes in musculoskeletal shoulder disorders? A systematic review. BMC Musculoskelet. Disord. 2021 ; 19;22(1):560.
24. Deegan O, Fullen BM, Segurado R, Doody C. The effectiveness of a combined exercise and psychological treatment programme on measures of nervous system sensitisation in adults with chronic musculoskeletal pain-a systematic review and meta-analysis. BMC Musculoskelet. Disord. 2024 ; 14;25(1):140.
25. Reis JT, Silva IG, Borges AC, Reis AP, Santos WA, Benevides KA, Abreu SA, Moreno T, Almeida JQ, Mangueira CD, Vasconcelos FH. The Relationship between Depression and Chronic Pain: A Literature Review. J. adv. med. 2024 ; 17;36(8):301-12.
26. Bérubé M, Martorella G, Côté C, Gélinas C, Feeley N, Choinière M, Parent S, Streiner DL. The effect of psychological interventions on the prevention of chronic pain in adults: a systematic review and meta-analysis. Clin. J. Pain. 2021 ; 1;37(5):379-95.
27. de C Williams AC, Fisher E, Hearn L, Eccleston C. Psychological therapies for the management of chronic pain (excluding headache) in adults. Cochrane database of systematic reviews. 2020(8).
28. Gong C, Shan H, Sun Y, Zheng J, Zhu C, Zhong W, Guo J, Chen B. Social support as a key factor in chronic pain management programs: a scoping review.. Curr. Psychol. 2024;43(31):25453-67.
29. Arango-Dávila CA, Rincón-Hoyos HG. Depressive disorder, anxiety disorder and chronic pain: multiple manifestations of a common clinical and pathophysiological core. **Rev. Colomb. Psiquiatr. (Engl. Ed.)** . 2018 ; ;1;47(1):46-55.