



The Relationship Between Pain Intensity, Pain Beliefs, and Emotion Regulation Skills in Non-Surgical Spinal Pathology Pain

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Abstract

Aim: Chronic pain, particularly spinal pain, presents a significant health concern globally. This study aims to investigate the interplay between pain beliefs, emotion regulation strategies, and pain severity in individuals with complaints of spinal pain.

Material and Method: A sample of 100 participants presenting with back and neck pain, without indications for surgery, completed measures assessing pain beliefs, emotion regulation strategies, and pain severity.

Results: Results indicated that individuals with higher levels of psychological pain beliefs reported lower pain severity, while those employing maladaptive emotion regulation strategies experienced greater pain severity.

Conclusion: These findings underscore the importance of considering psychological factors in pain management and highlight the potential utility of targeting emotion regulation strategies in clinical interventions. Future research should further explore the impact of pain beliefs and emotion regulation on treatment outcomes and the pain experience, providing valuable insights for enhancing pain management approaches.

Keywords: Spinal pain, pain beliefs, emotion regulation, spinal pathology

INTRODUCTION

Globally, pain is acknowledged as a common and rising health concern (1). Pain is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (2) by the International Association for the Study of Pain (IASP). Individuals perceive body sensations and somatic complaints differently, and research supports the idea that people perceive pain differently (3).

Research involving individuals with chronic pain has demonstrated that anxiety and depressive symptoms frequently coexist with the pain (4). Moreover, it has been shown that depressed symptoms are linked to elevated pain-related disability, catastrophic thinking, and functional impairment in these persons (5). Furthermore, studies suggest that a number of variables, including age, a sedentary lifestyle, low or inadequate levels of 25 (OH) vitamin D, obesity, and smoking, may contribute to the genesis of chronic neck and back pain (6,7). Furthermore,

it has been proposed that psychological variables like anxiety and depression may account for variations in treatment response within a subgroup of patients, even in the face of multiple medical and surgical treatment methods for patients with chronic back and neck pain (8).

Studies have shown that chronic pain is more common in people with pre-morbid psychosocial stresses such as depression or anxiety (9). This phenomenon can be explained by the theory that psychosocial elements become more prominent when pain becomes persistent, creating a vicious cycle that intensifies the person's pain experience and degree of impairment. Thus, in order to establish a thorough understanding and useful intervention techniques, addressing pain from a biopsychosocial viewpoint requires taking into account not only physical variables but also the patient's psychological and social surroundings (10). Accordingly, pain is a multifaceted phenomenon that has elements related to neurophysiology, biochemistry, psychology, ethnicity, culture, cognition, and environment (11).

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Research examining pain from a biopsychosocial standpoint has demonstrated that a patient's expectations, beliefs, coping strategies, social support, diagnoses, health insurance, and even the employer's response can all affect how well they manage their pain (12). Of them, the idea of pain beliefs is particularly noteworthy.

According to Ellis, pain beliefs are made up of cognitions, thoughts, attitudes, and emotions. Research on pain beliefs has also shown that people who stop their treatment tend to have more negative pain beliefs. However, it is anticipated that these beliefs will lessen with cognitive-behavioral therapy (13). "Patients' beliefs about the causes of their pain and the expected effects of treatment" (14) is the definition of pain belief. Two sub-dimensions comprised organic pain beliefs that signal physical pain and pose a threat to well-being and psychological pain beliefs that involve interior consequences and emotions impacting the pain experience (15). While certain beliefs may help people cope with their pain (16), negative views about pain have been linked to higher use of healthcare resources and the use of analgesic medications (17), as well as being predictive of pain severity, disability, and distress (18).

It has also been noted that disruption in emotion regulation influences pain beliefs as well as the sensation of pain. Ellis points out that emotion regulation dysfunction is characterized by a lack of awareness of one's emotions, an inability to accept emotions, and an inability to manage behaviors in reaction to negative emotions (19). Pain beliefs, on the other hand, contain cognitions, thoughts, attitudes, and emotions (13). Since unfavorable life events have been shown to disrupt emotion regulation abilities and emotion regulation dysfunction is linked to somatization, it is crucial to comprehend how emotion regulation dysfunction affects the pain experience in this instance (20). Dysfunction in emotion regulation can make it difficult to accurately measure the level of pain and other factors associated with pain, which can make evaluation challenging (21,22). Research has indicated that people who struggle with controlling their emotions are more prone to abuse opioids for pain relief, which increases the intensity of pain and feeds a vicious cycle by impairing positive emotion regulation (23). In this context, it has been suggested that emotion regulation techniques may be helpful in the treatment of pain, underscoring the need for more research in this field (24).

Our study aims to evaluate the concurrent testing of pain-related beliefs and emotion regulation skills in individuals with complaints of spinal pain, given the 75-85% lifetime prevalence of spinal pain (25). Considering the lack of research in this field, we aim to thoroughly assess the connection between pain-related beliefs, emotion regulation abilities, and pain severity.

MATERIAL AND METHOD

Informed consent forms were signed by 100 participants who did not require surgery but came to the Brain and

Neurosurgery Clinic of Karabük University Training and Research Hospital between June 2022 and August 2022 with complaints of pain related to spinal pathologies. The participants ranged in age from 18 to 65, were literate in Turkish, and had no history of medication usage that could have led to mental symptoms or cognitive impairment. Additionally, they had no additional neurological, chronic medical, or psychiatric illnesses that could affect cognitive performance. They also did not have any other rheumatologic conditions.

Those who accepted to participate and fulfilled the inclusion criteria were given a sociodemographic information form created by our team as part of the study. In addition, the participants' own Pain Beliefs Questionnaire, Cognitive Emotion Regulation Questionnaire, and The Short-Form McGill Pain Questionnaire were given out. The Karabük University Non-Interventional Clinical Research Ethics Committee examined and authorized our investigation; the approval number for the study is 2022/924, dated May 31, 2022. The Helsinki Declaration's guiding principles were followed in the conducting of the study.

Measures

Sociodemographic data form: Developed by researchers, this form asks descriptive questions about the participant's gender, age, place of birth, educational background, and, if they are a student, their academic year as well as whether they have ever had a mental health diagnosis.

Pain Beliefs Questionnaire (PBQ): The Pain Beliefs Questionnaire (PBQ), created by Edwards et al. in 1992, has two subscales: the four-item Psychological Beliefs subscale and the eight-item Organic Beliefs subscale. Understanding the psychological and biological attributions of patients with chronic pain—which had not been previously investigated—was the primary goal of establishing the scale. The following are the item numbers for each subscale:

Items 1, 2, 3, 5, 7, 8, 10, and 11 are examples of organic beliefs. Beliefs in psychology: Items 4, 6, 9, 12. Participants are asked to check the option from six possibilities, numbered from 1. "never" to 6. "always," that best describes them. For every item, scores range from 1 to 6. The sum of the scores from all of the items in a subscale divided by the total number of items in that subscale yields the overall score for each subscale (26). Sertel-Berk (27) conducted the validity and reliability assessment for the Turkish version.

The Short-Form McGill Pain Questionnaire (SF-MPQ): A popular tool for measuring pain is the Short-Form McGill Pain Questionnaire (SF-MPQ), which was created by Melzack in 1987 and has been tested for validity and reliability in Turkish. The sensory (11 words) and affective (4 words) components of pain are assessed using a total of 15 descriptive words in this questionnaire. The three pain scores that result from this component of the

questionnaire are sensory, affective, and total pain ratio (sensory+affective), where 0 represents no pain, 1 is mild, 2 is moderate, and three is severe. A 6-point Likert scale is used to quantify overall pain severity, and a Visual Analog Scale (VAS) is used to assess pain felt at the time of assessment. 0 on this scale indicates no pain, one mild pain, two upsetting pain, three bothersome pain, four terrible pain, and five agonizing pain (28,29).

The Cognitive Emotion Regulation Questionnaire (CERQ): Garnefski, Kraaij, and Spinhoven (30) created the Cognitive Emotion Regulation Questionnaire (CERQ), a five-point Likert-type assessment tool (1=not at all suited for me, 2=slightly suitable for me, 3=partially suitable for me, 4=extremely suitable for me, and 5=totally suitable for me). There are 36 items in all on the scale. The Cronbach's alpha coefficient in the scale's initial iteration spans from .67 to .81. Self-blame, acceptance, centering on planning, positive refocusing, positive reappraisal, putting into perspective, catastrophizing, other-blame, and rumination are the nine subscales that make up the scale. Onat and Otrar (31) carried out the scale's adaption into Turkish and validity and reliability investigations. The results showed a test-retest reliability coefficient of $r=.1,00$ and a Cronbach's alpha value of $\alpha=.784$. The validity studies employed the criterion-related validity technique. The Negative Affect Scale and the Cognitive Emotion Regulation Questionnaire were shown to be statistically significantly correlated ($r=-.572$).

Statistical Analysis

IBM SPSS 21 software was used for statistical analysis. Normality distribution was checked using the Shapiro-Wilk test. Normally distributed data were presented as mean±standard deviation, while data that did not show normal distribution were presented as median (min-max). Chi-square test was used for comparing genders between groups. For comparing numerical variables between groups, T-test was used when data were normally distributed, and Mann-Whitney U test was used when at least one data did not follow normal distribution. The relationship between variables was evaluated using the Spearman correlation test. The significance level was set at 0.05.

RESULTS

A total of 100 patients presenting with complaints of back and neck pain to the Brain Surgery Polyclinic of Karabuk Education and Research Hospital, who were examined by a neurosurgeon and found to have no pathologies requiring surgery, were included in our study.

Since cutoff scores for the scales we used were not available and to ensure standardization, we categorized the SF-MPQ Pain Severity Scale based on mean values. Accordingly, in our statistical analysis, we classified individuals with SF-MPQ Pain Severity Scale scores below 17 as having low-level pain, and those with scores above 17 as having high-level pain. Demographic and clinical data according to this classification are presented in Table 1.

Table 1. Demographic and clinical data according to McGill Pain Questionnaire severity

| | Low McGill score n: 48 | High McGill score n: 52 | P |
|--------------------------------------|------------------------|-------------------------|--------------------------|
| Gender | | | 0.488 ^a |
| Woman | 35 | 41 | |
| Man | 13 | 11 | |
| Age | 45.31±11.57 | 41.63±11.39 | 0.232 ^c |
| Occupation | | | 0.62 ^a |
| Unemployed | 4 | 13 | |
| Employed | 18 | 11 | |
| Retired | 3 | 6 | |
| Housewife | 23 | 22 | |
| Educational level | | | 0.292 ^a |
| Primary school | 20 | 31 | |
| High school | 11 | 10 | |
| Associate degree | 6 | 5 | |
| Bachelor's degree | 11 | 6 | |
| Pain beliefs | | | |
| Organic beliefs | 26.04±6.27 | 24.15±6.15 | 0.132 ^b |
| Psychological beliefs | 9 (4-24) | 6 (4-17) | 0.002^c |
| Cognitive emotion regulation | | | |
| Self-blame | 11 (4-20) | 15.5 (4-20) | 0.022^c |
| Acceptance | 12.50±3.88 | 15 (4-20) | 0.018^c |
| Thought focus - deep thinking | 10 (5-20) | 13.75±4.19 | 0.004^c |
| Positive refocusing | 11.54±4.60 | 14 (4-20) | 0.016^c |
| Re-focusing on planning | 16 (5-20) | 18 (9-20) | 0.087 ^c |
| Positive reappraisal | 16 (8-20) | 18 (6-20) | 0.132 ^c |
| Reframing | 16 (8-20) | 18 (6-20) | 0.005^c |
| Ruin | 8 (4-20) | 8.50 (4-20) | 0.151 ^c |
| Blaming others | 6 (4-18) | 9 (4-20) | 0.013^c |

a: Chi-Square test, b: t test, c: Mann Whitney U test

In our study, 76 female and 24 male patients participated, and there was no difference between the two sexes in terms of pain severity. The mean age of the participants was 43.4±11.57 years. There were no significant differences in age, occupation, or educational status among the participants.

Of the participants, 51% were primary school graduates, 75% were married, and 29% were employed.

It was found that individuals with higher levels of psychological pain beliefs experienced significantly lower pain severity ($p=0.022$). Similarly, individuals who used cognitive emotion regulation strategies such as self-blame ($p=0.022$), acceptance ($p=0.018$), refocusing on planning ($p=0.004$), positive refocusing ($p=0.016$), putting into

perspective ($p=0.005$), and other-blame ($p=0.013$) were found to experience statistically more severe pain.

Furthermore, the relationship between pain beliefs and emotion regulation strategies with pain was evaluated in our study, and the data are presented in Table 2.

| Table 2: Relationship between McGill Pain Questionnaire and Pain Beliefs and CERS Subscales | | |
|---|------------------------------|------------------------------------|
| | Mcgill Pain Mean \pm sd | |
| | Mean \pm sd | Correlation coefficient (r)/ p* |
| | 17.31 \pm 9.01 | |
| Organic beliefs | 25.06 \pm 6.25 | -0.19/0.051 |
| Psychological beliefs | 9.00 \pm 4.58 | -0.26/0.007 |
| Self-blame | 12.90 \pm 4.90 | 0.25/0.012 |
| Acceptance | 13.41 \pm 3.99 | 0.23/0.017 |
| Thought focus - deep thinking | 12.58 \pm 4.51 | 0.29/0.003 |
| Positive refocusing | 12.69 \pm 4.57 | 0.16/0.093 |
| Re-focusing on planning | 16.17 \pm 3.50 | 0.17/0.083 |
| Positive reappraisal | 15.84 \pm 3.71 | 0.19/0.051 |
| Reframing | 16.02 \pm 3.52 | 0.32/0.001 |
| Ruin | 9.15 \pm 4.53 | 0.18/0.060 |
| Blaming others | 8.90 \pm 4.81 | 0.24/0.013 |
| Spearman correlation test | | |

According to the statistical evaluation, individuals who perceive lower pain severity tend to have higher levels of psychological pain beliefs. Additionally, the use of cognitive emotion regulation strategies such as self-blame, acceptance, refocusing on planning, putting into perspective, and other-blame is associated with increased pain severity. However, no significant relationship was found between subgroups of organic beliefs, psychological beliefs, and emotion regulation skills.

DISCUSSION

Numerous elements, including those that are structural, physical, psychological, social, lifestyle, and related health factors that interact, might affect the condition of pain. As such, it is critical to address pain from a biopsychosocial perspective (32,33). People who experience pain not only bear a physical burden but also financial difficulties, which are exacerbated by psychological considerations (34). Body language serves as a means of expressing psychological conflicts, anxieties, and wants when accompanied by psychological elements. There are variations in the degree of pain and how it is treated due to this vicious cycle, which also has an impact on people's mental and social circumstances (35).

It has been proposed that disparities in coping mechanisms for addressing pain may result from views about the biological or psychological causes of pain (36).

The majority of participants in our survey believed that pain results from physical damage, and we were unable to discover a meaningful correlation between the severity of pain and organic pain beliefs. Nonetheless, people with more prevalent psychological pain beliefs reported less severe pain, which is in line with the literature. Those without any health problems had higher psychological pain beliefs, according to Edwards et al. (1992) (26). Like our investigation, Ulus et al. (2014) discovered that people with less severe pain reported more common psychological pain beliefs (37). As evidenced by the findings of the Edwards et al. study, those without a history of suffering may express their discomfort less severely, given that attitudes about pain are particularly influenced by past experiences or lessons (38). This condition in our study may have resulted from those with low-level spinal pain not contemplating any damage to the affected area because they did not see the reason of their pain as physical. To clarify this part of pain sensation that has remained unclear, more research is required. Research has demonstrated that psychological factors are linked to different elements of pain, including chronicity and treatment resistance, which can affect functioning (39). We also looked at the connection, as shown in recent research (20), between emotion management techniques—specifically, somatization—and pain. Research on the relationship between pain and emotion regulation is scarce, but what is known is that those who use improper emotion regulation techniques typically have more severe pain (40). In line with these conclusions, our research also found that people who engage in unhealthy emotion regulation techniques—specifically, self-blame, rumination/deep thinking, and blaming others—tend to experience pain more acutely. In this sense, our work is consistent with the corpus of prior studies. It's common knowledge that those who have trouble controlling their emotions frequently somatize their feelings. When our participants employ improper emotion regulation techniques and give their current discomfort greater relevance, they may feel it more keenly.

The cognitive states that are absent from the literature are those that are still not well known in regard to this field. Thus, more investigation is required to comprehend the reactions to pain. Although the majority of the literature is supported by our findings, it is important to emphasize that those who use appropriate emotion regulation techniques—like acceptance and perspective—also report higher degrees of pain severity. While there isn't any information about this problem in the literature, it's hypothesized that this might be caused by the fact that there isn't a single cause for pain. Even while some people manage their emotions appropriately, there could be other factors that influence how intense pain feels to them. It is crucial to take into account how and when people employ emotion regulation techniques, as well as how this influences the management and treatment of pain. Therefore, the emphasis should be on comprehending how patients apply emotion regulation techniques and how those strategies affect pain management and persistence.

In the literature, no study investigating the relationship between pain beliefs and emotion regulation strategies in pain severity has been found. Our study is considered important in supporting the multidimensional investigation of psychiatric parameters in the etiology, progression, and resolution of pain. The fact that our study was conducted face-to-face with patients is also one of our strengths. However, our study has limitations, such as the lack of examination of how these parameters affect pain and their relationship with the treatment process. Additionally, our evaluation of spinal pain as a general concept in our study may have affected its standardization. In future studies, evaluating specific pathologies related to spinal pain, investigating the effects of pain beliefs and emotion regulation strategies on the process and treatment, and assessing the effectiveness of therapy would be beneficial.

CONCLUSION

Our study examined the relationship between pain severity and psychological parameters such as pain beliefs and emotion regulation strategies. In this context, individuals who endorsed higher levels of psychological pain beliefs reported lower levels of pain, while those who employed inappropriate emotion regulation strategies experienced more severe pain. Future research investigating the effects of pain beliefs and emotion regulation strategies on the pain process and treatment may provide valuable insights for clinical practice and the development of pain management strategies.

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Ethical approval: *The Karabük University Non-Interventional Clinical Research Ethics Committee examined and authorized our investigation; the approval number for the study is 2022/924, dated May 31, 2022. The Helsinki Declaration's guiding principles were followed in the conducting of the study.*

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