



The Relationship Between Emotion Regulation Strategies and Lifestyle with Pain Severity in Patients with Chronic Musculoskeletal Pain in Pain Clinics of Mashhad

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Abstract

The present study aimed to investigate the relationship between behavioral emotion regulation and lifestyle with pain intensity in patients with chronic skeletal pain disorder attending pain clinics in Mashhad. The study employed a descriptive-correlational research design. Both field methods (questionnaires) and library research (books and articles) were used for data collection. Additionally, the study is applied in nature, as its findings can be used to improve the status of the examined variables.

The statistical population consisted of all patients who were diagnosed with chronic skeletal pain disorder by physicians and referred to pain clinics in Mashhad during the second quarter of 2023. Due to the inability to precisely count the population size, the sample size was estimated using the Tabachnick and Fidell formula (2007). Accordingly, a sample of 160 participants was selected using convenience sampling.

Data were collected using the Behavioral Emotion Regulation Questionnaire by Craig and Garnefski (2019), the Lifestyle Questionnaire by Kern et al. (1997), and the McGill Pain Questionnaire (2009). Based on the results of the correlation test, there was a significant positive relationship between withdrawal and pain intensity ($r = 0.168$) and between ignoring and pain intensity ($r = 0.159$). Furthermore, a significant negative relationship was found between coping and pain intensity ($r = -0.190$), while a significant positive relationship was observed between cautiousness and pain intensity ($r = 0.202$).

Keywords: Behavioral Emotion Regulation, Lifestyle, Pain Intensity, Patients with Chronic Skeletal Pain Disorder.

Introduction

Chronic skeletal pain disorder is a prevalent condition in which individuals report severe and persistent chronic pain, primarily localized to the skeletal and muscular regions. This disorder can negatively impact quality of life, work capacity, and social relationships, often leading to stress, anxiety, and depression. Patients with chronic skeletal pain disorder frequently suffer from increased pain sensitivity, chronic fatigue, and impaired functionality. The effective diagnosis and treatment of this complex condition remain challenging and require a range of therapeutic approaches, including pharmacotherapy, psychotherapy, physiotherapy, and surgical interventions (McParland et al., 2021).

The prevalence of chronic pain is increasing worldwide, with approximately 25% of chronic pain patients experiencing symptoms beyond pain, such as depression and anxiety, leading to chronic pain syndrome. Chronic pain affects multiple aspects of an individual's life, including emotional, interpersonal, occupational, and physical functioning, while imposing

substantial economic and healthcare burdens on society (Rawat et al., 2019). Chronic pain significantly influences patients' daily lives, where the degree of its impact is closely tied to the perceived intensity of pain (Garens et al., 2022).

Pain intensity results from a complex interaction between pain stimuli and various cognitive and emotional factors. Chronic pain is recognized as a major public health issue, contributing to significant social and economic burdens. Beyond affecting patients as a sensory and emotional challenge, pain intensity also influences their families. The severity, duration, or location of pain can have a profound effect on physical functioning, reducing physical activity and potentially leading to disability. This, in turn, impacts other aspects of daily life (Zanini et al., 2018). Patients often describe the extensive consequences of pain intensity, such as a loss of enjoyment in life, reduced emotional well-being, fatigue, weakness, and sleep disturbances. Furthermore, reactive psychological symptoms like depression and anxiety may play a significant role in determining pain intensity (Kim et al., 2021). Highlighting the importance of pain intensity is essential, as patients with chronic pain may endure extremely high levels of pain. To address these challenges, healthcare professionals increasingly adopt comprehensive biopsychosocial frameworks to examine and manage factors related to pain intensity (Hilmer et al., 2021).

In this context, a study conducted by Russell and Park (2018) identified behavioral emotion regulation as one of the key factors influencing pain intensity. Behavioral emotion regulation refers to the ongoing processes individuals employ to manage and modify their emotional responses, including enhancing, suppressing, facilitating, or disrupting their emotional expressions (Sotward et al., 2021). It involves efforts to manage, adjust, or change emotional reactions and emotional behaviors. Behavioral emotion regulation consists of five distinct subscales, each with four items, representing individuals' actions after encountering stressful events. These subscales include distraction, withdrawal, active coping, seeking social support, and ignoring (English et al., 2021).

The ability to regulate emotions allows individuals to utilize appropriate strategies when confronting potentially distressing situations. Emotion regulation, as a cognitive process, enables individuals to control how they experience and express emotions. Those with better emotion regulation skills demonstrate enhanced abilities in social interactions and problem-solving. Furthermore, this capability can significantly reduce stress and anxiety, ensuring improved quality of life (Malagoli et al., 2021). Effective emotion regulation has been proposed as a useful strategy to alleviate pain intensity, as individuals capable of managing negative emotions related to chronic pain are likely to report lower perceived pain intensity and exhibit greater pain tolerance. By reducing emotions such as fear, worry, and anger associated with chronic pain, the experience of pain may appear less distressing and overwhelming. Moreover, effective use of coping strategies, such as functional care and refocusing, enables individuals to regulate their emotional reactions to pain. In this way, behavioral emotion regulation can increase pain tolerance by reducing the psychological distress associated with chronic pain (Greenway et al., 2021).

On the other hand, Gotki et al. (2021) identified lifestyle choices as another factor influencing pain intensity. Lifestyle refers to the ways individuals, families, and communities respond to their physical, psychological, social, and economic environments (Henrich et al., 2021). It reflects patterns shaped by shared values and beliefs within a group or community, manifested as common behaviors (Yildiz, 2021). Lifestyle can also encompass both tangible and intangible determinants: tangible factors relate to demographic variables such as individual characteristics, while intangible factors pertain to psychological aspects like personal values, preferences, and attitudes (Welten et al., 2018).

Lifestyle has several defining characteristics:

1. Expressiveness – individuals and groups express themselves through purposeful behaviors.
2. Choice – individuals and groups consciously choose behaviors to represent themselves. Greater choice indicates a broader social structure and reduced external and internal constraints.
3. Distinction – lifestyle differentiates individuals with similar behaviors in certain contexts from those with divergent behaviors (Chou & Kim, 2021).

Lifestyle can have a significant impact on pain intensity in individuals with chronic pain. Unhealthy lifestyles, such as low physical activity, poor diet, and smoking, are associated with higher pain intensity. This relationship operates through several mechanisms. First, inadequate physical activity and excess weight exacerbate musculoskeletal problems, increasing pain. Second, smoking and poor dietary habits can intensify inflammation and other factors that worsen pain symptoms. Third, stress arising from poor diet and unhealthy habits may contribute to anxiety and depression, further amplifying perceived pain. Effective chronic pain management requires lifestyle modifications, including regular physical activity, balanced nutrition, smoking cessation, and stress management. A healthy lifestyle can reduce inflammation, anxiety, and depression while improving overall health, thereby alleviating pain intensity (Lahous et al., 2022).

In explaining the relationship between behavioral emotion regulation, lifestyle, and pain intensity in patients with chronic skeletal pain disorder, it can be stated that better regulation of emotional reactions and healthier lifestyles enable patients to reduce their perceived pain intensity. Appropriate behavioral emotion regulation can alleviate anxiety, depression, and anger caused by chronic pain, thereby reducing perceived pain. Similarly, a healthy lifestyle can mitigate inflammation, stress, and symptom exacerbation, resulting in reduced pain. These two factors may also interact; for example, improved emotion regulation can lead to healthier lifestyle choices, further reducing pain intensity.

Effective treatment of chronic skeletal pain disorder must consider these reciprocal effects and focus on enhancing stress management, emotion regulation, healthy lifestyle habits, and pain relief techniques to reduce pain intensity. However, few studies have examined the role or relationship of these variables in reducing pain intensity among individuals with chronic pain. Existing studies, such as Lahous et al. (2022), have explored the relationship between lifestyle and chronic cancer pain, while Serisupa et al. (2021) investigated the role of cognitive emotion regulation in pain management. Nevertheless, based on the researcher's review, no prior study has simultaneously examined the relationship between behavioral emotion regulation, lifestyle, and pain intensity in patients with chronic skeletal pain disorder.

Therefore, the present study aims to answer the following question: Is there a relationship between behavioral emotion regulation and lifestyle with pain intensity in patients with chronic skeletal pain disorder?

Methodology

The present research is descriptive and correlational in nature. Both field-based (questionnaire) and library-based (books and articles) data collection methods were employed. This study is applied in terms of purpose, as its results can be utilized to improve the status of the variables. The statistical population consisted of all patients with chronic musculoskeletal pain diagnosed by physicians who visited pain clinics in Mashhad during the second quarter of 2023. Due to the inability to count the population precisely, the sample size was estimated using the formula proposed by Tabachnick and Fidell (2007). According to the proposed formula for correlational studies, the minimum sample size was calculated using the equation $n > m + 50$ (where $5 < p < 15$). In this formula, n represents the sample size, p is a constant value between 5 and 15, and m indicates the number of variable components. Based on this rule, the sample size was determined as follows: $(11 \times 10) + 50 = 160$, where 11 represents the components of the variables (5 for behavioral emotion regulation, 5 for lifestyle, and 1 for pain intensity), and the sample size was 160 individuals. Participants were selected using a convenience sampling method by approaching patients at pain clinics in Mashhad who met the inclusion and exclusion criteria and were willing to cooperate.

The required data were collected using the Behavioral Emotion Regulation Questionnaire by Kraaij and Garnefski (2019), the Lifestyle Questionnaire by Kern et al. (1997), and the McGill Pain Questionnaire (2009).

Behavioral Emotion Regulation: The Behavioral Emotion Regulation Questionnaire was developed by Kraaij and Garnefski (2019) to measure behavioral coping strategies and to complement the Cognitive Emotion Regulation Questionnaire, which focused solely on cognitive coping. The questionnaire includes five distinct conceptual subscales, each consisting of four items. It is scored on a 5-point Likert scale (1 = almost never to 5 = almost always), with scores on each subscale ranging from 4 to 20. The subscales include: (1) distraction, (2) withdrawal, (3) active approach, (4) seeking social support, and (5) ignoring. The developers validated the scale using exploratory factor analysis, which identified five factors with eigenvalues greater than 1, explaining 78.6% of the total variance. The factor loadings for the items ranged from 0.79 to 0.94. The psychometric properties of the questionnaire were evaluated in a study by Kraaij and Garnefski (2019) on a sample of 457 adults from the general population. Cronbach's alpha reliability coefficients for the subscales were reported as follows: distraction (0.86), active approach (0.91), seeking social support (0.91), ignoring (0.89), and withdrawal (0.93). Test-retest reliability ranged from 0.47 to 0.75, and concurrent validity was reported as 0.67. In an Iranian context, Sadat Rasool and Alizadeh Fard (2021) validated this questionnaire and reported a test-retest reliability coefficient of 0.82 and Cronbach's alpha of 0.73, indicating acceptable reliability. Exploratory factor analysis confirmed the presence of five factors—distraction, withdrawal, active approach, seeking social support, and ignoring—which together explained 66.84% of the total variance. In this study, Cronbach's alpha for this questionnaire was calculated to be 0.86.

Lifestyle: The Lifestyle Questionnaire was developed by Kern et al. (1997) to assess various dimensions of lifestyle. This questionnaire contains 62 items divided into five main subscales: (1) belonging-interest, (2) coping, (3) responsibility, (4) need for approval, and (5) cautiousness. Items are scored on a 5-point Likert scale, with responses ranging from "strongly disagree" (1) to "strongly agree" (5). Fifteen items are reverse-scored, specifically items 4, 12, 26, 30, 35, 40, 49, 52, 54, 55, 59, and 60. In a study conducted by Bashiri (2007), the Cronbach's alpha for this questionnaire was reported to exceed 0.7, indicating acceptable reliability. In the present study, Cronbach's alpha for the Lifestyle Questionnaire was calculated at 0.90.

Pain Intensity: The Revised McGill Pain Questionnaire (2009) was developed by Dworkin et al. to expand and update the original McGill Pain Questionnaire by including both neuropathic and non-neuropathic pain indicators. It consists of 22 items rated on a scale of 1 to 10, measuring pain intensity. The findings demonstrated acceptable reliability and validity for this questionnaire. In Iran, Tanhaei et al. (2012) examined the psychometric properties of the Revised McGill Pain Questionnaire. Factor analysis results supported the scale's validity, and comparisons between patients with and without pain provided evidence for criterion validity. Content validity was also deemed sufficient for measuring pain in patients. Reliability was evaluated using Cronbach's alpha and split-half methods, both of which demonstrated acceptable reliability. In this study, Cronbach's alpha for the Revised McGill Pain Questionnaire was calculated to be 0.79.

Findings

In this study, a total of 160 patients visiting pain clinics in Mashhad participated. Out of these 160 participants, 28.1% were under 20 years old, 57.5% were aged 20–30, 8.1% were aged 31–40, 3.1% were aged 41–50, and 3.1% were over 50 years old. Additionally, 85.6% were single, and 14.4% were married. In terms of education, 0.6% had less than a high school diploma, 29.4% had a high school diploma, 3.8% had an associate degree, 49.4% held a bachelor's degree, and 16.9% had a master's degree or higher. Regarding work experience, 90.6% had 0–5 years, 5.6% had 6–10 years, 1.3% had 16–20 years, 1.3% had 21–25 years, and 1.3% had over 25 years of work experience.

Table 1: Descriptive Statistics of the Research Variables

Variable Source		N	Minimum	Maximum	Mean	Standard Deviation
Pain Intensity		160	22	201	83.28	44.29
Emotion Regulation	Distraction	160	6	19	12.39	2.66
	Withdrawal	160	4	20	11.84	3.79
	Active Approach	160	7	20	13.70	2.98
	Seeking Social Support	160	4	20	13.69	3.82
	Ignoring	160	4	20	10.41	3.92
Lifestyle	Social Interest	160	16	33	24.80	3.53
	Coping	160	24	41	32.54	3.55
	Responsibility	160	11	39	22.93	6.37
	Need for Approval	160	17	35	26.51	3.68
	Cautiousness	160	6	25	14.31	4.04

Based on the data presented in Table 1, the means and standard deviations for the study variables are shown separately. To examine the relationship between emotion regulation, lifestyle, and pain intensity in patients with chronic musculoskeletal pain attending pain clinics in Mashhad, simultaneous linear regression analysis was employed. Prior to conducting the regression model, the assumptions of this statistical method were assessed and confirmed, including: 1. the assumption of univariate normality, 2. the assumption of no multicollinearity, 3. the assumption of independence of errors, and 4. the assumption of a relationship between the scores of the dependent variables.

Table 2: ANOVA and Regression Summary Table for Pain Intensity

Criterion Variable	Source of Variation	Sum of Squares	df	Mean Squares	F	Sig.	R	R ²	Adjusted R ²
Pain Intensity	Regression	35851.872	10	3585.187	1.93	0.045	0.33	0.11	0.05
	Residual	276002.475	149	1852.366					
	Total	311854.344	159	-					

Based on the data presented in Table 2, the significance level of the F statistic for pain intensity, with degrees of freedom 10 and 149, was calculated to be less than 0.01. This indicates that the regression model is significant at the 0.05 level ($F(10,149) = 1.93, p < 0.05$). The variables of emotion regulation and lifestyle were found to effectively predict pain intensity. Furthermore, the strength of the correlation, based on the value of the multiple correlation coefficient, was 0.11 for pain intensity, and the adjusted R-squared value was 0.05. This suggests that 5% of the variance in the criterion variable, pain intensity, can be explained by the predictors, namely emotion regulation and lifestyle.

Table 3: Pearson Correlation for Emotional Regulation and Pain Intensity

Variable		Distraction	Withdrawal	Active Approach	Seeking Social Support	Ignoring
Pain Intensity	indicator					
	R	0.116	0.168*	0.066	-0.023	0.159*
	Sig.	0.142	0.033	0.407	0.772	0.045

**Significant at 0.05; N = 160

According to the results of the correlation test, there is a significant positive relationship at the 0.95 confidence level between withdrawal and pain intensity with a correlation coefficient of $r = 0.168$, as well as between ignoring and pain intensity with a correlation coefficient of $r = 0.159$.

Table 4: Pearson Correlation for Lifestyle and Pain Intensity

Variable		Social Interest	Coping	Responsibility	Need for Approval	Cautiousness
Pain Intensity	indicator					
	R	-0.081	-0.190*	0.036	-0.077	0.202*
	Sig.	0.308	0.016	0.653	0.333	0.010

**Significant at 0.05; N = 160

According to the results of the correlation test, there is a significant negative relationship at the 0.95 confidence level between coping and pain intensity, with a correlation coefficient of $r = -0.190$. Additionally, there is a significant positive relationship at the 0.95 confidence level between being cautious and pain intensity, with a correlation coefficient of $r = 0.202$.

Discussion of Findings

Based on the results of the correlation test, there is a significant positive relationship between withdrawal ($r = 0.168$) and ignoring ($r = 0.159$) with pain intensity. This finding aligns with the results of studies conducted by Saidi et al. (2022), Jahangiri et al. (2022), Ansari and Aghababaei (2020), Aryavand et al. (2019), Srisupa et al. (2021), and Russell and Park (2018).

Saidi et al. (2022) demonstrated that chronic pain components can be predicted based on emotional regulation strategies in patients with chronic pain. Jahangiri et al. (2022) showed that attachment styles and ego strength, mediated by cognitive emotion regulation, indirectly affect pain adaptation. Similarly, Ansari and Aghababaei (2020) found that emotion regulation strategies predict pain perception among homemakers. Aryavand et al. (2019) confirmed the mediating role of emotion regulation (reappraisal and suppression) in the relationship between internal locus of control and pain intensity. Furthermore, Srisupa et al. (2021) revealed a significant relationship between the use of emotion regulation skills and pain management, while Russell and Park (2018) demonstrated a positive relationship between emotion regulation and self-management of pain.

In the present study, a significant positive correlation was observed between withdrawal, as a behavioral emotion regulation strategy, and pain intensity in patients with chronic skeletal pain. Withdrawal is considered a maladaptive strategy for managing stressful events. According to Gorman and Stanton (2021), this strategy involves attempting to divert attention from stressful situations through engagement in alternative activities. Although withdrawal may provide temporary relief, it can ultimately increase an individual's focus on pain, leading to heightened pain perception. This strategy, often used as a means to escape or avoid stressors, can create a maladaptive cycle in patients with chronic skeletal pain. Avoidance of activities that may exacerbate pain reduces opportunities to develop healthier coping mechanisms for managing pain and stress. Over time, this approach not only increases pain intensity but also negatively impacts quality of life, levels of physical activity, and social interactions.

The findings also revealed a significant positive correlation between ignoring, another behavioral emotion regulation strategy, and pain intensity. Ignoring stressful situations involves temporarily shifting focus to other activities to avoid pressure, giving the mind a short-term reprieve. Gorman and Stanton (2021) explain that ignoring entails behaving as though the stressful situation does not exist. Although this strategy may appear to temporarily alleviate stress, it can exacerbate pain in the long run because it prevents individuals from learning and implementing more effective coping mechanisms.

Ignoring can be viewed as a form of cognitive avoidance, where individuals evade processing distressing thoughts, emotions, or information. While cognitive avoidance may reduce immediate emotional distress, it can ultimately increase pain sensitivity through diminished coping skills and awareness. Neurophysiological mechanisms associated with emotion regulation and pain perception may further intensify this effect. By avoiding stressors and negative emotions, individuals may inadvertently heighten their sensitivity to pain, which increases pain intensity in patients with chronic skeletal conditions.

Additionally, the results demonstrated a significant negative correlation between coping ($r = -0.190$) and pain intensity and a significant positive correlation between cautiousness ($r = 0.202$) and pain intensity. These findings are consistent with studies conducted by Jafari and ShirAlizadeh (2023), Mohammadi et al. (2021), Asadi Ailar et al. (2014), Rahimian Boogar and Rostami (2012), Lahos et al. (2022), and Gotchi et al. (2021).

Jafari and ShirAlizadeh (2023) highlighted the mediating role of lifestyle in predicting pain intensity based on emotional expressiveness in women with breast cancer. Mohammadi et al. (2021) demonstrated a strong positive relationship between a health-promoting lifestyle and pain acceptance. Asadi Ailar et al. (2014) found that an Islamic lifestyle negatively predicts pain in cancer patients. Similarly, Rahimian Boogar and Rostami (2012) revealed that lifestyle significantly predicts migraine headaches. Lahos et al. (2022) demonstrated a significant relationship between adopting a healthy lifestyle and reduced pain, while Gotchi et al. (2021) reported that an unhealthy lifestyle is directly associated with the progression of chronic pain.

In the current study, a significant negative relationship between coping as a lifestyle component and pain intensity was observed in patients with chronic skeletal pain. This relationship indicates the critical role of psychological processes in influencing the physiological experience of pain, effectively acting as a bridge between mind and body. Individuals with greater coping skills are better equipped to manage life stressors, resulting in reduced pain intensity. These findings highlight the importance of adopting positive and active approaches to life's challenges, even in individuals suffering from chronic pain.

Coping strategies as part of a lifestyle encompass methods such as problem-solving, seeking social support, positive thinking, and mindfulness. Effective stress management not only alleviates pain experiences but also improves quality of life and overall well-being. Individuals who utilize active coping strategies and perceive a sense of control over their lives are more likely to experience lower pain intensity. This sense of control empowers individuals to manage stressors and painful situations effectively.

Finally, the results showed a significant positive correlation between cautiousness as a lifestyle component and pain intensity. This relationship suggests that individuals who exhibit excessive cautiousness may experience higher levels of pain. Overly cautious individuals often focus excessively on potential risks and concerns, which can lead to chronic stress and anxiety—two factors known to heighten pain perception.

Chronic stress and anxiety keep the body in a persistent state of physiological arousal, increasing pain sensitivity. Additionally, cautious individuals may avoid physical or social activities that are beneficial for alleviating pain. Physical activity reduces pain intensity by enhancing circulation and strengthening muscles, which alleviates pressure on the musculoskeletal system. By avoiding such activities, overly cautious individuals miss out on these benefits.

Moreover, excessive cautiousness can intensify physiological stress responses, such as the overproduction of cortisol, a stress hormone that increases pain sensitivity and promotes inflammation. Elevated cortisol levels may, therefore, contribute to heightened pain perception in patients with chronic skeletal conditions.

Conclusion

The findings of the current study underscore the significant roles of emotion regulation strategies and lifestyle components in pain intensity among individuals with chronic skeletal pain. Maladaptive strategies such as withdrawal, ignoring, and excessive cautiousness are positively associated with pain intensity, while adaptive strategies like coping play a protective role in reducing pain. These results emphasize the importance of interventions that promote active coping mechanisms, reduce cognitive avoidance, and encourage balanced and health-promoting lifestyles to improve pain management outcomes.

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