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Predicting Chronic Pain and Self-Regulation Based on Positive and Negative Emotions in Patients with Chronic Pain

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ABSTRACT: This study aimed to predict chronic pain and self-regulation based on positive and negative emotions in patients with chronic pain. From all patients with chronic pain sent to hospitals in Bandar Abbas, Iran, 165 people were selected by cluster random sampling using the Morgan table as a statistical sample. To collect data, the Positive and Negative Emotion (PANAS) questionnaire, chronic pain, and self-regulation (SRI-S) were used. Multiple regression was used to test the research hypotheses. The results showed that positive emotion significantly explains about 45% of the variance of the criterion variable (Chronic pain) and negative emotion about 40% of the variance significantly. Also, positive emotion significantly explains 29% of the variance of the criterion variable (self-regulation), and negative emotion about 26% of the variance. In general, the findings of the present study supported the role of emotions in pain perception, tolerance, and self-regulation in patients with chronic pain.

Keywords: Positive and negative emotions, pain intensity, self-regulation, patients with chronic pain.

Introduction

The International Society for the Study of Pain (1986) described pain as an unpleasant sensory and emotional experience with actual or potential tissue damage or described as such. According to this definition, pain is always a mental experience; the nature and other characteristics of pain, such as its persistence and recurrence, inevitably rely on self-report methods (Asghari & Nicholas, 2001). According to this definition, chronic pain is the pain that has lasted for a long time. Chronic pain has been used, for example, some studies have described pain that has lasted more than a month as chronic (Di Tella & Castelli, 2016), and others have studied it that lasted more than a month. Chronically Introduced (Cox, Kuch, Parker, Shulman, & Evans, 1994), World Association for the Study of Pain (1986) has sought to establish the same time criterion for chronic Think of pain. According to the recommendations of this association in clinical activities and dealing with non-cancerous pain, choosing a period of 1 month was appropriate to distinguish between acute pain and chronic pain, but for research purposes, a period of one month was better as a criterion for diagnosing chronic pain.

Pain is divided into two categories in terms of duration: acute pain and chronic pain. Acute pain is usually the result of illness or injury and lasts less than three months, can be associated with tissue damage, or it recurs over time. Chronic pain affects different aspects of a person's life, such as emotional, interpersonal, occupational, and physical functioning, and imposes enormous costs on society and the health care system (Turk & Okifuji, 2002). In the twentieth century, following the failure of medical

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treatment and the introduction of the three dimensions of pain by Malzak and Wall in control theory, which considered the severity and nature of pain as a function of sensory, cognitive, and emotional mechanisms, they found the role of psychological factors and treatment based on these factors (Turk & Okifuji, 2002).

One of these factors is self-regulation. Self-regulation is a multidimensional structure and includes motivational-emotional, social, and physiological cognitive processes affecting the active control of purposeful actions (Hane & Fox, 2006). Active and multifaceted control processes, initiating actions, moderating, sustaining, and coordinating self-regulation were applied (Eisenberg, 2000). This control system was responsible for execution, attention, inhibition, and activation, and made it possible to suppress inappropriate responses, initiate and continue the necessary responses (Bailey & Henry, 2007). The importance of self-regulation in psychological activities and normal development as well as the emergence of adaptation problems had been confirmed in various studies (Boroumand, Asghari moghaddam, Shaeiri, & Mesgarian, 2014).

Therefore, paying attention to the emotional dimension of pain and emotional problems in self-regulation, it was expected that there was a relationship between this factor and chronic pain. Of course, it should be noted that the relationship between self-regulation and chronic pain was not a simple one, but each of these variables might be influenced by different factors that affected the relationship between these two variables. Among these factors were positive and negative emotions.

The role of positive and negative emotions in pain had been demonstrated by several studies (Turk & Okifuji, 2002). Positive and negative emotions were the main dimensions of emotional experiences (Watson, Clark, & Tellegen, 1988). Negative emotions include fear/anxiety, sadness/depression, and anger/hostility. These emotions are part of a deterrent behavioral system whose primary purpose is to deter behaviors that lead to unpleasant consequences. Positive emotions include pleasure, interest, trust, and awareness. These emotions are part of the facilitative behavioral system that leads the body to pleasurable stimuli (Watson et al., 1988).

Some studies had shown that up to 40 to 50% of patients with chronic pain suffered from depression (Turk & Okifuji, 2002). Depression was usually related to pain by assessing a person's impact on pain in life and their ability to control pain and their belief in their ability to function. Anger exacerbates pain by increasing autoimmune arousal and reduces a person's motivation to accept treatment and control pain (Turk & Okifuji, 2002). Of course, it should be noted that the experience of pain has a negative relationship with positive emotions such as happiness and optimism so that these emotions cause pain relief in people with chronic pain (Gurung, 2018).

Due to the prevalence of chronic diseases at a young age, this disease could be associated with the individuals' social functioning, emotional, psychological problems; with the course of the disease and lack of proper control, it doubled anxiety and depression. What seemed to be necessary for dealing with

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such a disease was to address the psychological issues of patients with chronic pain and the various emotional, self-regulatory, and emotional problems that patients faced.

The need for research conducted abroad to benefit patients with chronic pain from the benefits of exercise as a complementary treatment was a new hope to alleviate the physical and mental pain of patients with chronic pain. The prevalence of the disease was higher in Indo-Europeans than other races, while it was less common in blacks and yellows (Bazyari Meimand, Alipour, Poladi Reishahri, & Habibi Asgarabadi, 2017). Therefore, because our country's race was a branch of the Indo-European race, these diseases and strategies needed to deal with complications. Therefore, this article was conducted to predict chronic pain and self-regulation based on positive and negative emotions in patients with chronic pain.

Material and Methods

The present study was applied in terms of purpose, descriptive and correlational. The study population in this study were all patients with chronic pain who referred to hospitals in Bandar Abbas in the first six months of 1998, which according to statistics were 287 people. Therefore, the sample size of the present study according to the statistical population and using Morgan table 165 people were determined and selected by cluster random sampling. Participants completed an informed consent before beginning the study. Based on the data collection, Positive Emotion and Negative Emotion Scale (PANAS), Chronic Pain Rate Questionnaire by Von Korff, Ormel, Keefe, and Dworkin (1992) and Self-Regulation Scale (SRI-S) were used to collect data. In the study of Díaz-García et al. (2020), the validity of the Positive Emotion and Negative Emotion Scale was confirmed by confirmatory factor analysis, and its reliability was 0.91. In the present study, its reliability was calculated to be 0.81. In the study of Hasenbring et al. (2012), the validity of the chronic pain questionnaire of Van Korf et al. was confirmed by confirmatory factor analysis, and its reliability was 0.82. In the present study, its reliability was calculated to be 0.83. In the study of Yeom, Fleury, and Keller (2008), the validity of the Self-Regulation Scale (SRI-S) was confirmed by exploratory factor analysis and its reliability was 0.94. In the present study, its reliability was calculated to be 0.86. Multiple regression was used to test the research hypotheses. Data were analyzed using SPSS software version 22.

Results

Descriptive statistics of variables were presented in Table 1 and normality test results in Table 2. Table 1 showed that for the variables of positive and positive emotion, the mean (standard deviation) of the positive emotion component was 3.7 (1.3) and negative emotion 2.1 (0.89). In chronic pain variable, the mean (standard deviation) of the pain component was 65.23 (21.34), and the pain disability component was 2.96 (0.91). Also in the self-regulation variable, the mean (standard deviation) of positive performance was 65.7 (24.32), controllability as 57.3 (18.65), and emotion expression as 69.25 (24.12),

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assertiveness was 71.23 (25.46) and well-being was 84.43 (30.29). Also, according to Table 2, the data for all variables followed the normal pattern.

Table 1. Descriptive statistics of positive and negative emotion variables, chronic pain and self-regulation

Variables	Components	N	Mean	SD
Negative and positive emotion	Positive emotion	165	3.7	1.3
	Negative emotion	165	2.1	.89
Chronic pain	Chronic pain	165	65.23	21.34
	Disability resulting from pain	165	2.96	.91
Self-regulatory	Positive performance	165	65.7	24.32
	Controllability	165	57.3	18.65
	Revealing emotions	165	69.25	24.12
	decisiveness	165	71.23	25.46
	Welfare	165	84.43	30.29

Table 2. Results of Kolmogorov-Smirnov normality test

Variable	Kolmogorov-Smirnov				
	index	df	Significance level	skewness	kurtosis
Negative and positive emotion	.097	164	.127	.197	-.396
Chronic pain	.124	164	.179	-.653	-.290
Self-regulatory	.169	164	.213	-.646	-.283

According to the research hypotheses, chronic pain and self-regulation could be predicted criterion variables based on positive and negative emotions. Multiple regression was used to test the hypotheses. According to Table 3, positive emotion significantly involved 45% of the variance of the criterion variable (Chronic pain) and negative emotion as 40% of the variance. Also, according to Table 4, positive emotion significantly involved 29% of the variance of the criterion variable (self-regulation), and negative emotion was 26% of its variance significantly.

Table 3. Predicting chronic pain from positive and negative emotion components

Criterion variable	Predictors	Non-standard coefficients		Standard beta coefficients	T	*p*	Tolerance statistics	VIF
Chronic pain		B	Non-standard coefficient error					
1	Fixed effect	2.37	.27	-	8.47	.001	-	-
2	Positive emotion	.86	.052	.67	16.43	.001	.77	1.28
3	Negative emotion	.79	.07	.63	15.17	.001	.73	1.35
Model 2: Positive emotion predictor variable		R = -0.67			R^2 = 0.448			
Model 2: Negative emotion predictor variable		R = 0.63			R^2 = 0.396			

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Table 4. Predicting self-regulation from positive and negative emotion components

Criterion variable	Predictors	Non-standard coefficients		Standard beta coefficients	T	*p*	Tolerance statistics	VIF
Self-regulation		B	Non-standard coefficient error					
1	Fixed effect	2.28	.26	-	7.67	.001	-	-
2	Positive emotion	.68	.05	.54	14.87	.001	.66	1.24
3	Negative emotion	.66	.06	.51	12.25	.001	.64	1.31
Model 2: Positive emotion predictor variable		R = -0.543			R^2 = 0.294			
Model 2: Negative emotion predictor variable		R = 0.512			R^2 = 0.262			

Discussion

The aim of this study was to predict chronic pain and self-regulation based on positive and negative emotions in patients with chronic pain. Findings showed that positive and negative emotion significantly predicted the variables of chronic pain and self-regulation. The results of this study were consistent with the results of Oreyzi, Nasery Mohammadabadi, and Askari (2010), M. Besharat, Koochi, Dehghani, Farahani, and Momenzadeh (2013), and M. A. Besharat, Noorbakhsh, R, and Farahani (2012). In these studies, chronic pain, such as fibromyalgia, could cause the inability to regulate emotion, especially negative emotion reduction and positive emotion increase.

Positive and negative emotions had a great effect on reducing or increasing the severity of pain because positive and negative emotions were the main dimensions of emotional experiences. Some studies had shown that 40 to 50% of patients with chronic pain suffered from depression (Cox et al., 1994). Depression was also associated with pain by assessing a person's impact on life and their ability to control pain or to function and adjust to specific situations. Anger exacerbated pain by increasing autonomic arousal and reduced a person's motivation to accept treatment and control pain.

However, according to the results, the experience of pain had a negative relationship with positive emotions, so that these emotions caused pain relief in people with chronic pain. Findings showed that there was a correlation between positive and negative emotions and also in patients with chronic pain. The results of this study were in line with the results of Wade (2001). In explaining this hypothesis, it could be said that positive emotion reflected the levels of activity in the left forehead areas. The activity of this area of the brain was related to the mesolimbic dopaminergic system. This system played an important role in brain and emotional processes. Researchers had shown that people with chronic pain had abnormalities in the dopaminergic system, and a decrease in dopamine levels increased the severity of the pain. Based on this, it could be suggested that because positive emotion was associated with increased activity of the dopaminergic system, it reduced the severity of pain**.** Findings showed that the pain in different social and cultural environments were examined.

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