

## Evaluating the relationship between personality traits, coping strategies and pain catastrophizing in patients with chronic pain

Shiva Jalilvand Qazvini<sup>1\*</sup>, Farshad Hasanzadeh Kiapei<sup>2</sup>, Bahram Mirzaian<sup>3</sup>

1. MA student of clinical psychology, Islamic Azad University of Sari, Mazandaran, Iran
2. Associate professor at Mazandaran University of Medical Sciences
3. Associate professor in clinical psychology, Islamic Azad University of Sari, Mazandaran, Iran

\*Corresponding Author: Shiva Jalilvand Qazvini, Sari, Mazandaran Province, IRAN [shivajalilvand@yahoo.com](mailto:shivajalilvand@yahoo.com)

### Abstract:

The study aimed at investigating the relationship between personality traits, coping strategies and pain catastrophizing in patients with chronic pain. The study adopted a descriptive-correlational approach as its methodology. The population of the study consisted of patients with chronic pain who referred to a pain clinic center of Mazandaran University of Medical Sciences among whom 100 persons were randomly selected. The data gathering tools included NEO Personality Inventory with 60 questions, Rosenstiel and Keefe's 42-item questionnaire on coping strategies as well as a Pain Catastrophizing Scale (PCS) with 13 questions developed by Sullivan, Bishop and Pivik the reliabilities of which were estimated through Cronbach's alpha which were equal to 0/79, 0/86 and 0/66, respectively. The Pearson correlation coefficient and regression analysis were used for data analysis. The results showed that there was a relationship between features such as extraversion, agreeableness, conscientiousness, neuroticism, openness and pain catastrophizing in patients with chronic pain. There were also some relations between cognitive and behavioral coping strategies and pain catastrophizing in such patients (patients with chronic pain). The share of each of these components of personality traits and coping strategies on predicting the pain catastrophizing in patients with chronic pain was different. And the variable of extraversion (98%) and behavioral strategies (39%) were the highest in predicting the pain catastrophizing in patients with chronic pain.

**Keywords:** personality traits, coping strategies, pain catastrophizing, patients.

### Introduction

Diseases are considered as the most important factors that affect human health and well-being. Among different diseases, chronic pain has an important place. About 25 to 30 percent of the population in many industrialized countries is suffering from chronic pain out of which 50 to 70 percent are partially or fully disabled. Pain is one of the most common phenomena that prompted people to seek help from healthcare systems. Not only are the stress and inconvenience caused by pain, but also the other consequences for the person suffering from stressors such as medical costs and family and career consequences have influence over various aspects of a person's life (Shakeri, 2008). For this reason, after saving the patients' lives, pain relief serves as one of the main priorities and there have been many attempts to control the pain.

As defined by the International Association for the Study of Pain (IASP), pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage and has both sensory and emotional sides. The emotional aspect refers to the unhappiness that a person experiences. The duration of the pain can be divided into two categories of acute and chronic pain. Acute pain is usually caused by disease or injury which lasts less than three months; however, chronic pain will continue for at least three months which can be associated with tissue damage. The issue which has received much attention and was remarkably discussed by psychological researchers in the field of psychological factors and processes influencing the pain experience is chronic pain in which patients with such pain have to experience biological, psychological and social complications as well as enduring the pain (Azadfallah et al., 2012). Living with chronic pain requires considerable emotional

endurance and suffering. Also, pain reduces the affective and emotional abilities of a person and his constant desire to get rid of such pain in most cases is unattainable which ultimately demoralizes the patient and gives him a feeling of hopelessness, helplessness and depression. Moreover, chronic pain not only undermines the patient's capabilities, but also weakens his supportive family's desire and ability. Chronic pain is a common problem that negatively affects the people's quality of life (Azadfallah et al., 2012). However, pain catastrophizing increases pain, anxiety, confusion and emotional processes complications along with reducing the effective methods to cope with pain reduction. Cognitive reactions such as fear and pain catastrophizing bring about constant focus on physical symptoms and instigate activity avoidance intensifying the pain and disability of the person (Ghushchyan et al., 2011).

Blickmor (1993) considered pain perception as the most fundamental aspect of consciousness. So at any level, pain can trigger a useful incentive and serve as a motivation for a person seeking treatment. Pain is usually a sign that makes a person seek for medical care. People with different personality types would often tolerate the severe and sometimes obvious signs of disease in the absence of pain (Amiri et al., 2013). Another important issue in health psychology is the patients' personality traits. Personality traits in everyday life refer to the permanent features and characteristics which have not changed from time to time and are pointed toward the individuality of each person. Personality traits can provide models to predict the people's behavior and mental states and individual differences serve as an important factor that show why some people are able to cope with conditions better than others and have different levels of motivation, satisfaction and mental health (Haghshenas, 2006).

According to psychodynamic theory, some people, consistent with their personality traits and childhood experiences, are prone to experience various pain disorders, and pain has a symbolic significance in their lives and has several functions. Symbolically speaking, pain could indicate anger or aggression that has been sublimated or compensated for the

feeling of guilt. Sometimes, the internalization of an object or a loved one who is lost or passed away could lead to feel the pain. In terms of functionality, pain may cause the circumvention or escape from the repressed conflict or satisfy the needs of dependence (Shakeri, 2008).

The strategic role of individuals in keeping with their personalities associated with the pain tolerance and endurance is different. Accordingly, Rosensteel and Keef (1983) suggested different types of pain coping strategies including distraction, pain reinterpretation, soliloquy, ignoring the pain, pain catastrophizing, praying and hopes. Studies conducted by Huron and Mitchell (2003) have shown that people with high neuroticism, when exposed to stressful situations, try to seek relief through passive strategies such as avoiding, self-blame, wishful thinking and interpersonal militancy-based practices such as hostile response and relieving the negative emotions and tensions (catharsis). Coping strategies as a part of one's character may be rooted in childhood experiences. Children observe their parents' patterns of confrontation and learn how they cope with stressful life events. Research findings by Syvberg (2002) confirm that lower levels of coping strategies are associated with higher levels of stress and introversion. Stress in these patients is much higher and thus the coping patterns and strategies also differ with others (Hatami, 2009). Coping strategies are activated or deactivated efforts exerted in response to threatening situations aiming at reducing the threat and emotional distress. Coping strategies may cause relaxation, or even create emotional distress. Emotion-based coping strategy interacts effectively with the problem that is difficult to control and has instigated pressure. People who use strategy are seeking to inquire from a person in charge or speak with relatives and friends about the issue to gain help. Considering the problem-solving strategy, the person tries to deal with the problem and learns new skills as well as seeking negotiation and compromise to fix the problem. In cognitive-based strategy, the person seeks to reduce his emotional stress. Evidence has revealed that sticking to increasing information in these patients is not enough, but rather it enhances the ability of patients

and their families to cope with the stress of chronic pain in everyday life (Safari et al., 2015).

There seems to be differences between the behavior-based or cognitive-based coping strategies as their being efficient and inefficient. At the time of pain, cognitive-based coping strategies aim at solving the problem or keeping the pain controlled (Golchin et al., 2011). In order to maintain the desired level of agreeable psychological health, people with chronic diseases need to deal with challenges and threats associated with the disease. Coping strategies affect both the perception of pain and the ability to control the pain in their daily activities (Mozaffaripour et al., 2010).

In the study conducted by Mousse (1981), it was concluded that people who adopted inappropriate strategies to control their problems are more susceptible to emotional exhaustion (depersonalization).

Studies by Paglyvny and Cooper (1982) showed that experiencing stress could be attributed to the result of an interaction between various sources of pressure and the person. Their proposed structure model suggested that all people did not consider one stressful situation and their personality disorders in terms of their personal and family experiences overshadowed their responses to stressors (Rajaiee, 2010).

Pain catastrophizing is applied to prevent distraction from the painful stimulus and patients pay more attention to the pain, as a result, it was difficult to control and repress thoughts of pain and cogitation about the pain increases. In this case, because the person cannot escape from pain or focuses on other activities to distract his attention, therefore, disability and symptoms of depression appear (Borumand et al., 2013). Hence, in a study conducted by Hoyer (2003) aiming at determining the coping strategies role with pain catastrophizing in patients found that among the studied coping strategies only the pain catastrophizing strategy had a direct relationship with pain and the correlational analysis showed that patients with higher pain levels had higher disability score and those who had used less pain catastrophizing and tried to ignore the pain and

used soliloquy had less disability. Balderson, Lin and VanKraft (1998) showed that those who had backache, two months after the diagnosis, refrained from being active because they believe that the consequences of doing activities would be so severe and this could lead to their inability (Omid et al., 2013). Thus, according to research studies conducted, this study aimed at finding whether there is a relationship between personality traits, coping strategies and pain catastrophizing in patients with chronic pain or not.

## Methodology

The study adopted a descriptive-correlation approach as its methodology. The population of the study comprised all the patients suffering from chronic pain referring to a pain clinic center of Mazandaran University of medical sciences from June 2015 to December 2015. 100 subjects were selected as the study sample through random sampling.

## Research Tools

In order to collect research data, 3 data collection tools were used including:

**A. NEO Personality Factors Inventory:** McCrae and Costa (1985) developed an inventory (questionnaire) entitled NEO for the first time with 185 questions. Subsequently, the two researchers conducted studies and developed two questionnaires with 240 questions and 60 questions to measure people's personality traits. This questionnaire has been used in different groups and is a good instrument for measuring personality traits. In order to assess the personality traits, the NEO shortform questionnaire with 60 questions was used. The test measures 5 personality traits including: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A) and conscientiousness (C). Each of these features is measured in this test with 12 questions. Participants answered questions in 5 degrees Likert type format comprising strongly disagree, disagree, no idea, agree and strongly agree. Scoring is based on 0,1,2,3,4 values and vice versa. The minimum and

maximum score per person for each scale is between 0 and 48. This test is suitable for people over 17.

To revise the (FFI- NEO) questionnaire, McCrae and Costa (2004) in a study conducted on 1492 persons reported the correlation coefficient for NEO 240-item questionnaire on 5 personality traits as 0/83, 0/83, 0/91, 0/76 and 0/86. Cook (1999) conducted a study on 117 couples and reported the questionnaire alpha coefficient ranging from 0/85 to 0/92. Kiamehr (2002) in a study conducted on students of Tehran University measured the NEO test reliability for the five personality traits of N, E, O, A and C as 0/79, 0/73, 0/42, 0/58 and 0/77, respectively. Amanollahi (2005) in a study conducted on the reliability of NEO using Cronbach's alpha and test-retest method reported the following results. The reliabilities using test-retest method for the five factors explained were 0/87, 0/84, 0/79, 0/80 and 0/82; also through using the Cronbach's alpha, the reliabilities of the given five factors were 0/76, 0/65, 0/59, 0/48 and 0/85. There were some similarities between the extraversion and neuroticism proposed by McCrae and Costa and the dimensions of extraversion and neuroticism mentioned in Eysenck's theory. In addition, the agreeableness and conscientiousness in McCrae and Costa's model might indicate the bottom end in the Eysenck's neuroticism (impulse control). Openness was highly correlated with intelligence. Accordingly, agreeableness had a high correlation with the concept of Alfred Adler's social interest (McCrae and Costa, 1991; Zakrmn, 1991). NEO Inventory contained a number of questions (60 questions) about the feeling, coping with stressors in stressful situations, ways of thinking, feeling and behavior of the ways to deal with high pressure, but the aim of assessment is not to see whether they are right or wrong, instead, the goal of completing this questionnaire is purely conducting scientific research.

**(B) Coping strategies questionnaire:** the coping strategies, developed by Rosensteil and Keav in 1983, has 42 questions designed to measure coping ability with pain. The strategy in the form of six cognitive strategies includes distraction, pain reinterpretation, soliloquy, ignoring the pain, pain catastrophizing praying and hope. The questionnaire

included 2 subscales on the ability to control the pain and the ability to reduce pain by using the strategies given. Subjects would be asked to read each statement carefully and specify, when dealing with pain, how much of each of the strategies they would use using a 7 point scale (from 0 to 6 (0 = no, 3 = Sometimes and 6 = always).

1. Distraction (2-7-12-16-26-27 and 42)
2. Pain reinterpretation (4-10-23-30-31-34 and 39).
3. Soliloquy (3-6-8-9-18-19 and 20)
4. Ignoring pain (1-17-21-24-29-35 and 41).
5. Pain catastrophizing (5-11-13-25-32-33 and 37)
6. Praying and hope (14-15-22-28-36-38 and 40).

In order to validate the reliability, the Cronbach's alpha coefficient and test-retest methods were used. The reliability through using Cronbach's alpha coefficient as a benchmark for the total calculation was equal to 0/92. Coping strategy reliability was estimated to be 0/73 through using test-retest reliability and Pearson correlation being conducted on 50 subjects within 2-6 weeks which was statistically significant at less than 0/100. Test-retest reliability for coping strategies demonstrated the stability of its basic structures. Iverson (2006) reported the internal consistency of this scale as 0/86. The questionnaire's validity and reliability were estimated and confirmed by Padiab, Vahedi and Ghazipour (2013) and the items internal consistency was reported to be 0/80. In the study conducted by Safari, Kavosi, Jouibari and Mohammadi (2015), the test-retest reliability and internal consistency of the questionnaire were 0/82 and 0/83, respectively.

**(C) Pain catastrophizing scale:** the pain catastrophizing scale developed by Sullivan, Bishop and Pivik has 13 questions that measures 3 subscales of rumination, magnification, and helplessness based on Likert scale ranging from 1 to 4. The scale is based on the hypothesis that pain catastrophizing correlates with different levels of pain, disability and psychological disability. In a study conducted by Sullivan et al (1995), rumination with 41%, magnification with 10% and helplessness with

8% comprised the total variance. The Cronbach's alpha for the subscales of rumination, magnification, and helplessness were 0/87, 0/60 and 0/88, respectively, and the general scale coefficient for pain catastrophizing was equal to 0/87.

In a study by Mohammadi and Dehghani (2013) on assessing pain catastrophizing in the patients' families, the Cronbach's alpha coefficients for

rumination, magnification, and helplessness in the questionnaire were 0/65, 0/62 and 0/81, accordingly, and the total score for patient's pain catastrophizing scale was 0/84.

### Findings

Based on the data achieved through conducting the questionnaire, the following results were obtained:

**Table 1:** Correlation matrix of personality traits and pain catastrophizing

| Dependent variable<br>Independent variable | $r_m$   | sig   | N   |
|--|---------|-------|-----|
| Extroversion                               | **0/468 | 0/000 | 100 |
| Agreeableness                              | **0/414 | 0/000 | 100 |
| Conscientious                              | **0/274 | 0/000 | 100 |
| Neuroticism                                | **0/397 | 0/000 | 100 |
| Openness                                   | **0/363 | 0/000 | 100 |

Based on the results in Table 1, it can be said that since the correlation coefficient calculated were  $r_m=0/468$ ,  $r_m=0/414$ ,  $r_m=0/274$ ,  $r_m=0/397$  and  $r_m=0/363$  and because the significance level of 0.000 is smaller than the significance level of 0/05, so the null hypothesis is rejected and the hypothesis is confirmed that there is a relationship between personality traits and pain catastrophizing in patients with chronic pain.

**Table 2:** Correlation matrix of coping strategies and pain catastrophizing

| Dependent variable<br>Independent variable | $r_m$   | sig   | N   |
|--|---------|-------|-----|
| Cognitive                                  | **0/343 | 0/000 | 100 |
| Behavioral                                 | **0/428 | 0/000 | 100 |

As can be seen in Table 2, it can be stated that since the estimated correlation coefficients are  $r_m=0/343$  and  $r_m=0/428$  and the significance levels (0.000) which is smaller than the significance level of 0/05,

the null hypothesis is rejected and research hypothesis is confirmed and it can be concluded that there is a relation between coping strategies and pain catastrophizing in patients with chronic pain.

**Table 3:** Summary of regression analysis model

| Model | Multiple correlation coefficient | R2    | Standard coefficient determination |
|-------|----------------------------------|-------|------------------------------------|
| 1     | 0/498                            | 0/248 | 0/208                              |

The multiple correlation coefficient of 0/498 and the determination coefficient of R2=0/24 show that 24 percent of pain catastrophizing variance change in

patients with chronic pain is explained by the five personality traits of extraversion, agreeableness, conscientiousness, neuroticism and openness.

**Table 4:** Regression variance Analysis

| Source of variation | Sum of squares | Degrees of freedom<br>Df | Mean squares | F statistics | P value |
|---------------------|----------------|--------------------------|--------------|--------------|---------|
| Regression          | 1686/253       | 5                        | 337/251      | 6/19         | 0/000   |
| Residual            | 5115/907       | 94                       | 54/452       |              |         |
| Total               | 6802/160       | 99                       | --           |              |         |

The F statistics is equal to 6/19 and the significance level is 0.000. Since the significance level is smaller than 0/01, therefore, there existed a relationship between predictor variables and the criterion

variable confirmed with 99% confidence, that is, the share of each of the components of personality traits on pain catastrophizing prediction in patients with chronic pain was different.

**Table 5:** the Summary of regression analysis for predicting pain catastrophizing in patients with chronic pain based on five personality traits (n=100)

| Predictors    | Dependent variable: Personality trait |                                  | t value | P value |
|---------------|---------------------------------------|----------------------------------|---------|---------|
|               | Unstandardized coefficients "B"       | Standardized coefficients "Beta" |         |         |
| Fixed values  | 14/982                                | -                                | 1/679   | 0/000   |
| Extroversion  | 0/980                                 | 0/753                            | 2/765   | 0/007   |
| agreeableness | 0/635                                 | 0/486                            | 1/598   | 0/035   |
| Conscientious | 0/526                                 | 0/543                            | 0/988   | 0/001   |
| Neuroticism   | 0/697                                 | 0/550                            | 1/543   | 0/047   |
| Openness      | 0/439                                 | 0/665                            | 0/649   | 0/056   |

R=0/49, R<sup>2</sup>=0/24, R<sup>2</sup>=0/20, F=6/19, \* P<0/05, \*\* P<0/01

on standardized regression coefficients, can be achieved through the following equation:

As can be seen in Table 5, the R<sup>2</sup> values obtained (0/24) reveals that 43% of the variance for pain catastrophizing in patients with chronic pain is simultaneously explained by five personality traits. In other words, 24% of the pain catastrophizing variance in patients with chronic pain is simultaneously justified by the variables of extraversion, agreeableness, conscientiousness, neuroticism and openness. The observed R value of 0/49 also indicates that the current linear regression model can be used to predict. In addition, the calculated F value of 6/19 is significant at the confidence level of 99%. So, it can be concluded that there is a significant relationship between the five predictor variables and pain catastrophizing in patients with chronic pain. Finally, according to the description given and the obtained coefficients, the regression equation, based Table 6: Summary of regression analysis model

Pain catastrophizing (Y) =14/98 -(Openness) 0/66 + (neuroticism) 0/55 + (conscientiousness) 0/54 + (acceptance) 0/48 + (extraversion) 0/75 /

For one unit increase in variables of extraversion 0/75, agreeableness 0/48, conscientious 0/54, neuroticism 0/55 and openness 0/66, the pain catastrophizing in patients with chronic pain witnesses a one unit increase.

Table 6 shows the Enter-based regression analysis for predictor variables of coping strategies and the criterion variables of pain catastrophizing

| Model | Multiple correlation coefficient | Determination coefficient | Standard coefficient determination |
|-------|----------------------------------|---------------------------|------------------------------------|
| 1     | 0/586                            | 0/346                     | 0/330                              |

The multiple correlation coefficient of 0/586 and determination coefficient of  $R^2=0/34$  shows that 34 percent of pain catastrophizing variance in

patients with chronic pain can be predicted and explained by coping strategies through two cognitive and behavioral variables.

**Table 7:** Regression variance Analysis

| Source of variation | Sum of squares | Degrees of freedom<br>Df | Mean squares | F statistics | P value |
|---------------------|----------------|--------------------------|--------------|--------------|---------|
| Regression          | 1670/259       | 2                        | 835/130      | 15/78        | 0/000   |
| Residual            | 5131/901       | 97                       | 52/906       |              |         |
| Total               | 6802/160       | 99                       | --           |              |         |

The F statistic is equal to 15/78 and the significance level is 0.000. Owing to the fact that the significance level is smaller than 0/01, therefore, the significant relationship between predictor variables and the criterion variable is confirmed with 99% confidence, meaning that the share of each of the components of personality traits on pain catastrophizing prediction in patients with chronic pain is different.



**Table 8:** Summary of regression analysis for pain catastrophizing prediction in patients with chronic pain based on two variables of coping strategies (n=100)

| Predictors          | Dependent variable: Coping strategy |                                 | t value | P value |
|---------------------|-------------------------------------|---------------------------------|---------|---------|
|                     | Unstandardized coefficients "B"     | Standardized coefficient "Beta" |         |         |
| Fixed value         | 16/317                              | -                               | 1/112   | 0/000   |
| Cognitive variable  | 0/330                               | 0/180                           | 1/850   | 0/067   |
| Behavioral variable | 0/512                               | 0/393                           | 4/050   | 0/000   |

As can be witnessed in Table 8, the R<sup>2</sup> values gained (0/34) pinpoint to the fact that 34% of the variance for pain catastrophizing in patients with

chronic pain is explained by two coping strategy variables. In other words, 24% of the pain catastrophizing variance in patients with chronic pain is simultaneously justified by the coping strategy variables. The observed R value of 0/58 also specifies that the current linear regression model can be used for predicting the variables. Moreover, the calculated F value of 15/78 is significant at the confidence level of 99%. So, it can be concluded that there is a significant relationship between the two coping strategy variables and pain catastrophizing in patients with chronic pain. Finally, considering the explanation given and the obtained coefficients, the regression equation, based on standardized regression coefficients, can be achieved through the following equation:

$$\text{Pain catastrophizing (Y)} = 16/31 - 0/18 (\text{cognitive}) + 0/39 (\text{behavioral})$$

For one unit increase in cognitive variable 0/18 and behavioral variable 0/39, the pain catastrophizing in patients with chronic pain witnesses a one unit increase.

## Discussion and conclusion

The findings of the first research hypothesis showed that there was a relationship between personality traits and pain catastrophizing in patients with chronic pain. Also, there was a relationship between extraversion and pain catastrophizing in patients with chronic pain. The results of the study by Amiri et al (2013) suggested that among those who were leaving addiction, the extrovert compared to introvert type used more coping strategies. The studies by Smith et al (2006) suggested that the openness brought about more vulnerability to disease. Acceptability and negative emotionality have brought about a reduction in longevity and an increase in the incidence of dangerous diseases. Bisschop et al (2006) suggested that there existed a significant relationship between conscientiousness and pain catastrophizing. The studies by Borumand et al (2013) suggested that there was a significant correlation between suicidal ideation and pain intensity and suicidal ideation and pain catastrophizing. Mozaffaripour et al (2010) had also pointed out that there was a significant relationship between pain catastrophizing, pain anxiety, neuroticism, social support and coping strategies with functional

disability in patients with rheumatoid arthritis. Studies by Turner et al (2005) revealed that there was a significant negative relationship between the openness and pain related disability in patients which is consistent with previous results. It seems that patients with a freshness and vitality extrovert show more positive attitude towards pain. It seems that those who have higher extroversion have positive attitudes, encouragement and higher participation in activities and are more interested to interact with others making up more on the mental capacity to prevent the pain catastrophizing. Patients with chronic pain and higher agreeableness experience more stressful events on the one hand, and on the other hand, regardless of stress level, are more prone to experience negative emotions and distress and are less willing to deal with their pain catastrophizing. It seems that people with higher conscientiousness are less depressed and have less fear associated with pain, and show higher competence in dealing with pain. Undoubtedly, patients with high neuroticism show a wide range of negative emotions such as nervousness, anxiety, excitement, moodiness, incompetence, fear, uncertainty, instability, dissatisfaction, irritability and so many others. They are dissatisfied with their low self-esteem in the face of disease and may also have unrealistic expectations of those around them.

The results of the second hypothesis showed that there was a relationship between coping strategies and pain catastrophizing in patients with chronic pain. The results of the recent studies by Safari et al (2015) showed that there was a significant relationship between pain catastrophizing, social support, anxiety, pain and cognitive coping strategies in cancer patients. Accordingly, Davoudi et al (2011) pointed to the fact that mindfulness-based stress reduction intervention, in case of continuity of regular treatment, could effectively help reduce pain and reduce the application of coping strategies in pain catastrophizing. The studies by Gilasi et al (2013) suggested that behavioral coping strategies affected the level of disability caused by migraine. Also,

Cologne et al (2004) in their study arrived to the conclusion that the behavioral coping strategies both affected their perception of pain and the ability to control the pain which is in line with previous results. The cognitive coping strategies often seek to examine the impact of factors such as attribution styles, expectations, beliefs, self-efficacy, self-control, attention to pain stimuli, problem solving on the perception of pain and problems associated with it though considering the multi-dimensional aspects such as pain, and emotional and physiological aspects. And the cognitive coping strategies can increase active confrontation, positive reappraisal, and acting against ineffective automatic thoughts, and thereby, reduce the perception of pain and lead to an increase in qualified skills. Thus, this prevents the pain catastrophizing. On the other hand, in acute condition, the behavioral coping strategies such as resting would be effective in facilitating the recovery period, but in chronic types, since the recovery comes later or it never happens, the continued lack of mobility as a strategy to deal with persistent pain can be taken by individuals. The behavioral coping strategies can reduce the person's focus on pain and can lead to increased volatility. Providing relevant information in behavioral coping strategies may lead to reduced pain feeling and reduced anxiety related issues, therefore, it would result in less pain catastrophizing.

The results of the third hypothesis indicated that the share of each of the components of personality traits on predicting pain catastrophizing in patients with chronic pain was different. The results of the recent studies by Ghasroldashti (2013) suggested that extraversion negatively predicted pain interference in daily work. The results of this study showed that mood and personality traits had impacts on pain intensity and implications which is consistent with the results of this study. It seems that introverted patients showed less

sensitivity to low level stimuli and had a higher threshold than other personality traits, but patients with personality traits of agreeableness, conscientiousness, neuroticism, openness who experienced chronic pain gradually separated themselves from all social activities and assumed that the boundaries of their world was very limited and small. The more they were involved with themselves, the higher they lost interest in their surrounding world.

The results of the fourth hypothesis showed that the share of each of coping strategies components in predicting the pain catastrophizing in patients with chronic pain was different. The results of the studies by Golchin (2011) suggested that behavioral and cognitive coping strategies influenced the bio-psycho-social factors and changed the incompatible cognitions leading to decreasing back pain and reducing increased use of inefficient coping styles and maintaining efficient coping styles. Also, Azizi (2009) in his study reached the conclusions that there was no relationship between pain and depression. But there existed a significant correlation between pain catastrophizing and pain intensity and soliloquy which is consistent with the results of this study. While Omidi et al (2013) in their study concluded that there was a significant positive correlation between disability and pain, there was no significant correlation between coping strategies and pain that is not consistent with this study results. It seems that cognitive and behavioral coping strategies, compared to other strategies, reduce the risk of chronic diseases relapse. And by resorting to coping strategies, the cognition, mood, behavior, physiological, environmental and mental events can be corrected. In general, the application of cognitive-behavioral strategies in pain management, in addition to relieving pain, can cause patients' psychological status improvement and serves as an effective step to save on medication and therefore reducing the side effects of such medications.

Finally, based on the findings obtained, some recommendations are proposed:

- Given the idea that the practical application cannot be achieved through theoretical results, but according to the results of other similar studies and the findings of this study, it is recommended that we emphasize the importance of coping strategies and its impact on pain catastrophizing in patients with chronic pain in training sessions to patients at medical centers.
- It is recommended that therapists pay attention to personality traits and particularly apply cognitive behavioral therapy treatment to change attitudes and thinking about the tragedy of pain in psychological patients and decrease abnormal and ineffective thinking and as a result personality problems related to pain catastrophizing is reduced before and during treatment.
- In addition to the preventive measures, it is recommended that the evaluation of patients with chronic pain be considered first and besides the medical treatment and medication for chronic pain patients, psychological training necessary to prevent pain catastrophizing be provided to these patients.
- It is recommended that, in chronic pain, attention be exerted on assessing the psychological aspects associated with pain, and screening of patients with chronic pain in applying coping strategies have to be considered.
- It is recommended to identify factors that affect the progression of disability in early stages of the disease which can be very valuable in predicting and

preventing complications and adverse long-term consequences in patients.

- It is recommended that pain specialists with the health psychologists' contribution help patients with cognitive-behavioral strategies, manage their pain, and thereby, reduce drug dosage and side effects of analgesic drugs.
- It is recommended that by holding coping strategies training workshops for counselors and social workers employed in supporting organizations, new and helpful training methods be provided for patients with chronic pain.
- It is suggested that future research be concerned with variables associated with psychological adjustment, social and psychological wellbeing of patients with chronic pain.

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