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THE EFFECT OF COGNITIVE THERAPY ON MENTAL HEALTH AND PAIN RELIEF AMONG PATIENTS WITH CHRONIC BACK PAIN

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ABSTRACT

This study aimed to investigate the effectiveness of cognitive interventions on mental health and pain relief of patients with chronic back pain. The population included all patients with chronic back pain in clinics of Tehran. Available sampling was performed based on which 30 available patients with chronic back pain in clinics of Tehran were selected. The subjects were randomly divided into two (experimental and control) groups of 15. The study had an experimental approach with a pre-test and post-test design including an experimental group and a control one. In this study, the General Health Questionnaire and the Quebec Back Pain Disability Scale were used. ANCOVA was used to analyze the data. The results indicated that cognitive interventions have a positive effect on mental health and pain relief of patients with chronic back pain.

Keywords: *Chronic Pain, Mental Health, Back Pain, Cognitive Interventions*

INTRODUCTION

Back pain, as a skeletal-muscular disorder has a high prevalence of about 80% in all human societies, so that every individual experience it at least once in his/her life (Khalaj *et al.*, 2006). In ranking of disease that move people to visit doctor's office, back pain is second after cold, so that it is estimated that in America 18 million visit doctor's office for treatment of back pain each year (Miri *et al.*, 2013). In most cases, physical factors cause the pain but psychosocial, psychosis and behavioral factors extend or intensify the pain, affect the ability to cope with the pain and ultimately contribute to excessive intolerance of patients (Hansen *et al.*, 2010). Chronic back pain refers to back pain lasting more than 3 months (Rahimian Bougar, 2011).

Six percent of patients have persistent or recurrent back pain. In addition, One to 2% of people have incurable, severe and disabling back pain. This is why the use of psychological interventions, specifically cognitive-behavioral strategies for chronic pain is necessary in order to prevent social, occupational and functional damage (Morlion *et al.*, 2011). The results of studies on the effectiveness of individual interventions have shown that cognitive-behavioral techniques have the greatest effect (Willmott, 2003) and result in much useful effects on improving the mental health status (Bradley, 2003). The overall goal of cognitive-behavioral therapy (CBT) is to replace the cognitive, emotional, maladaptive coping skills with adaptive states for patients with chronic back pain. CBT alone does not involve all potentially important and contributing variables such as environmental factors in chronic back pain, but it is able to improve therapeutic and care services for the treatment of patients with back pain associated with disorders and comorbid conditions (Gatchel & Rollings, 2008).

Turk and Flor (2006) argue that group or individual CBT tailored for patients with chronic pain have six phases: 1) assessment, 2) re-conceptualization, 3) acquisition of skills, 4) strengthening skills and training skill use, 5) generalization and maintenance of skills and 6) follow-up assessment after treatment. According to studies, through adopting targeted measures and attention to ineffective beliefs and cognitions cognitive-behavioral models are effective in reducing the experience of pain, improvement of its negative implications and fostering healthy coping strategies (Rahimian Bougar, 2009; Magnussen *et al.*, 2005). According to the basic assumption of cognitive-behavioral models, cognitions and perceptions of patients form their emotions and behaviors, and thus patients' thinking affects their behavior as well as emotional well-being (Rahimian Bougar, 2011; Beck, 1995). Among the techniques of CBT, training specific coping skills, correction of dysfunctional cognitions, relaxation and stress management training,

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cognitive restructuring and problem solving are of great use in the management of chronic pain and are presently of a strong empirical support (Jungquist *et al.*, 2010).

Based on the research evidence, since psychological and behavioral factors are effective in the development of disability associated with chronic back pain, patients with chronic back pain benefit from interdisciplinary treatment including CBT (Boherman *et al.*, 2011). Many comparative studies on cognitive therapy for the treatment of pain compare cognitive components with behavioral ones. Detente, biofeedback and behavioral stepping strategies are often classified as behavioral component of CBT, while cognitive restructuring strategies, and cognitive coping skills training are commonly encompassed within (but not limited to) main cognitive components in CBT. Training cognitive skills for coping with pain includes ways to shift attention, modification of sense of pain, positive self-talk and mental imaging solutions. Cognitive restructuring strategies include diagnostic and management of maladaptive thoughts. The use of cognitive restructuring in the treatment of pain specifically focuses on identifying and modifying maladaptive cognition of relevant pain (Thorn, 2005).

Some psychological factors such as pain catastrophizing, passive coping strategies, fear-avoidance and multidimensional pain symptoms, significant reduction of activity levels or excessive activity involved in the development of chronic back pain are studied by cognitive-behavioral therapies (Vlaeyan *et al.*, 2002). Since psychological factors are involved in the development of such chronic pain, addressing the effect of cognitive interventions on mental health and pain relief in patients with chronic back pain is an important issue. Thus, this study seeks to answer the question of whether cognitive interventions affect mental health and pain of patients with chronic back pain. Janbozorgi and associates (2013) showed that CBT changes dysfunctional behaviors, corrects maladaptive cognitions and destructive emotions associated with pain, and decreases adverse effects of pain and improves psychological distress. Sajadian (2012) indicated that women with chronic back pain (N= 144), had higher scores on pain, pain catastrophizing, and fear-avoidance beliefs scales, but their mindfulness and both physical and mental quality of life were lower than those of the normal group. In addition, the best predictors of pain were quality of life related to physical health, fear-avoidance beliefs, catastrophizing and mental health-related quality of life. The results showed that the relationship between pain and pain catastrophizing is moderated by conscious mindfulness and anxiety has a mediating role in the relationship of conscious mindfulness and mental-physical quality of life. Gharayi Ardekani and associates (2012) showed that commitment and acceptance-based therapy were effective in relieving pain in women with chronic headache. Vakili and associates (2011) and Rahimian Bougar and Tabatabaian (2013) showed that CBT is effective in reducing depression in women with chronic back pain. Golchin (2010) found that in back pain cognitive and behavioral symptoms changed significantly, so that the pain relieved due to psychological factors change mediating in pain. In addition, efficient coping styles, an increase of inefficient coping styles, depression, anxiety, stress and somatic symptoms significantly increased. Therefore, it seems that CBT is effective in managing physical, behavioral and cognitive components of pain.

MATERIALS AND METHODS

Methods

Regarding the purpose, this study is classified as applied studies. According to the method of data collection and analysis, it follows an experimental approach with pre-test and post-test design involving an experimental group and a control one. To collect the data, before starting the interventions, the General Health Questionnaire (GHQ) and the Quebec Back Pain Disability Scale (QBPDS) were distributed among all of the subjects in the experimental and control groups and after the intervention, the subjects were trained in 12 sessions and then the effect were measured.

Population and Sampling

The study population included all women with chronic back pain who referred to hospitals and clinics in the city of Tehran. The sample consisted of 30 women who were available and were divided into two groups of 15. The sampling procedure was as follows: Based on the list of patients of a clinic suffering from chronic back pain, 30 patients were randomly selected.

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Data Collection Instruments

The field method was used. Measures included the GHQ and the QBPDS. The CBT booklet was used for therapeutic interventions training. The instruments used were as follows:

The Quebec Back Pain Disability Scale (QBPDS): The scale includes different activities and situations wherein the level of pain has been questioned. The questionnaire contains 25 five-choice items graded from 0 (no pain) to 4 (very severe pain). The reliability and validity of the scale have been confirmed by Golchin and Agah Hariss and the internal consistency coefficient of the items has been reported 0.9.

The General Health Questionnaire (GHQ): It is a screening inventory based on the self-reporting method, which is used in the clinical settings to trace those who have a mental disorder. The questionnaire has four subscales including somatic symptoms, anxiety, depression and social dysfunction. The GHQ has a validity of 84% (77% to 89%) and mean specificity of 82% (78% to 85%) (Williams & Goldberg, 1987; as cited in Oraki *et al.*, 2012).

Psychological Interventions

The therapy is based on talking with the patients. In the first stage, the therapist attempts to get the patient's way of thinking about him/ herself and about the others. In the second phase the therapist attempts to find problems that cause mental disorders for the individual. The intervention program is based on cognitive behavioral proposed by Turk and Ferry.

Procedure

After dividing the patients into two (control-experimental) groups, they were asked to complete the questionnaires. The completion of the questionnaires usually lasted 20 to 25 minutes and if participants' had problems in understanding the items of the questionnaires, the necessary explanations were allowed by the operator in simple and scientific language. After collecting the questionnaires, the experimental group received the CBT program twice a week for two months (12 sessions). The application of the CBT was set on chronic pain control.

Data Collection

To implement the program, after selecting the desired clinics and coordination with relevant departments, the purpose and process of the intervention was explained to the patients who suffered from chronic back pain in a meeting and they were invited to participate in the study by completing the questionnaires carefully. After collecting and scoring the questionnaires, 30 patients were randomly divided into control and experimental groups and then the interventions were performed on the sample. No intervention was considered for the control group. After the sessions, both groups were assessed using the same questionnaires and data were tabulated for the statistical analysis.

RESULTS AND DISSCUSION

Statistical Methods

Data analysis in this study was carried out through descriptive statistics (frequency, mean and standard deviation) and inferential statistics including analysis of covariance. All stages of data analysis were conducted by SPSS v.20.

Referential Results

Table 1: Results of the Effect of Cognitive Therapy on Mental Health and Chronic Back Pain

Source	SS	df	MS	F	Sig	Effect Size (η)
Mental Health	2864.18	1	2864.18	238.40	0.01	0.90
Error	312.36	26	12.1			
Back Pain	169.57	1	169.57	13.0	0.01	0.33
Error	338.96	26	13.4			

According to the results presented in Table 1, it is confirmed that cognitive intervention has a significant on mental health and pain relief in patients with chronic back pain. According to the results, table can be

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concluded that cognitive intervention on psychological health and reduce pain in patients with chronic back pain are effective;

Table 2: Results of the Effect of Cognitive Therapy on the Components of Mental Health

Source	SS	df	MS	F	Sig	Effect Size (η)
Somatic Symptoms	113.39	1	113.39	68.02	0.01	0.75
Error	38.34	23	1.67			
Anxiety	180.68	1	180.68	62.75	0.01	0.73
Error	66.23	23	2.88			
Social Dysfunctioning	0.32	1	0.32	0.20	0.01	0.86
Error	36.19	23	1.57			
Depression	209.76	1	209.76	185.27	0.01	0.89
Error	26.04	23	1.13			

According to the results, it could be concluded that cognitive intervention is effective in decreasing the components of mental health of patients with chronic back pain.

Discussion and Conclusion

The study shows that the presence of patients with chronic back pain in sessions were useful, because after the implementation of the workshop, the mean scores for the mental health subscales were significantly different. This finding confirms the effect of cognitive therapy on mental health, which has been previously stressed by Flor and associates (1992), Storang (1998), Morley and associates (1999), Guzman and associates (2001), Karjalayn and associates (2003), Velonbrok and associates (2004), Bogart and associates (2007), Vakili (2010) and Rahimian Bougar and Tabatabaian (2011). In explaining this hypothesis, it should be argued that there is significant difference between general health of patients with chronic back pain and that of healthy individuals. Chronic pain is and will be one of the most important medical problems in the world. Annually, millions of human beings suffer from this pain, but unfortunately, they do not receive appropriate treatment. Worldwide, chronic pain is the most important cause of suffering and disability for human beings, and this seriously affects the quality of human life (Loeser *et al.*, 2002).

According to the results, cognitive intervention affects mental health of patients with chronic back pain; according to Table 2, mean scores of somatic symptoms in the experimental group compared with the control group, decreased from the pre-test to the post-test. The result can be explained this way that in the CBT since individuals notice their damaged mental mechanisms, they take the responsibility of their own problems and try to inhibit pain and help improve their coping conditions by modifying, positive reappraisal and correcting the problems. In addition, patients with chronic back pain suffer from inefficient thinking, maladaptive interpretation of pain, cognitive distortions about the pain, such as pain catastrophizing, excessive generalization and fear of activities and cognitive avoidance related pain-provoking situations. These factors together with the use of negative coping strategies and lack of control over the pain lead to feelings of helplessness. In the CBT, patients attempt to understand and attempt to change them. The use of these techniques result in feelings of pain control, reduction of automatic negative thoughts and an increase in the person's sense of competence, which ultimately leads to the reduction of symptoms of depression and anxiety and improvement of mental health in patients with chronic back pain (Vakili *et al.*, 2009).

The effect of cognitive therapy on improvement of the mental health of patients with chronic back pain, can be explained that this treatment, in the first place, helps patients achieve a new concept of pain. In cognitive therapy sessions, first theories explaining chronic pain are introduced. Giving information to patients about how cognitive (thoughts, beliefs about pain), emotional factors, activities, and social factors (such as logical involvement with others) can open and close gates of pain and relieve or increase pain, can affect false interpretations of pain, catastrophizing and its uncontrollability. The therapist tries to

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identify irrational and inefficient thoughts driving the symptoms of anxiety and depression in patients and inform the patient of the role of these factors in the disease, and then replace thoughts that are more correct. In cognitive therapy sessions, negative automatic thoughts and that these thoughts lead to negative emotions (such as anxiety and depression) are discussed. A list of cognitive errors that lead to negative thoughts about pain is reviewed and patients are taught to identify those thoughts and emotions thereof. Then they are taught cognitive restructuring techniques to reconstruct the thoughts and replace them with more positive and adaptive ones (Otis, 2007, as cited in Mohammadi & Alibeigi, 2011, Trans.). According to the results, it could be concluded that the research hypothesis stating that cognitive interventions affect mental health and relieve pain in patients with chronic back pain is confirmed. According to Table mean scores of pain in the experimental group compared with the control group, decreased from the pre-test to the post-test. As the results show, cognitive interventions affect chronic back pain of patients with chronic back pain. This finding is consistent with Nasserri (2004), Mehrabian (2009), Rahimian Bougar (2011) and Janbozorgi and associates (2013). These researchers have confirmed the effectiveness of cognitive therapy in relieving the pain. In these studies, cognitive therapy has been defined as implementation of individual guidelines, such as distraction, mental imagery, motivational self-talk, detente, biofeedback, improving coping strategies including assertiveness, reduction of self-destructive negative thoughts, changing maladaptive beliefs about pain and goal setting (Gatchel *et al.*, 2007). Since cognitive processes such as attention, attributions and emotional processes such as pain-related fears and safety seeking behaviors, affect pain behaviors and disability levels, training emotional cognitive components of the CBT can lead to the correction processes and therefore be considered a key component for increasing the effective coping (Vlaeyen *et al.*, 2007). However, Eccleston and Kromboz (1999) suggest that pain quality changes by severity, novelty, unpredictability and threatening level and this change can make the individual focus on it leading to pain increase. Providing information related to the cognitive processing and distraction techniques can lead to pain relief. In addition, application of the CBT causes patients to have less anxiety and cope with it actively.

According to the results, cognitive interventions affected social components of patients with chronic back pain ($P < 0.01$). According to Table, mean scores of the experimental group compared with the control group, decreased from the pretest to the posttest. As can be seen, the researcher's cognitive interventions reduced the average score of components of the mental health scale (somatic symptoms, anxiety, insomnia, social dysfunction and depression). In this regard, it could be concluded that patients with chronic back pain face various crises at different times; thus, the use of this type of cost-effective psychological treatment can return a healthy and positive spirit to these patients. Cognitive interventions help the individuals pay attention to their pain and at the same time be more optimistic about the future and work on feelings of anxiety and come to the conclusion that they can take care of their daily routines. Dick and associates and Rashiq and associates also believe that coping strategies increase the individual's ability to cope with the pain, since training cognitive-behavioral components seems to help patients reappraise the phenomenon of pain and solve it through problem-solving techniques (Dick, 2008; Carroll, 2002).

In addition, Sullivan and associates (2001) showed that catastrophic thinking about pain is associated with higher perception of pain, more worry about pain, distress due to pain and attraction to pain. Catastrophizing the pain is associated with negative emotions and negative orientation towards self and the world. Cognitive restructuring is one of the cognitive behavioral components and problem-solving skills training can help to increase active coping, positive reappraisal, opposing dysfunctional automatic thoughts and thus problem solving and thereby reduce the perception of pain and increase effective skills (Free, 2007).

REFERENCES

Abedi M, Khalil Zadeh Poshtgol M and Asghari Moghaddam MA (2010). Pain self-control and social support at different levels of education for patients with chronic pain. *Contemporary Psychology* 5 505-506.

Research Article

Arab AM, Nourbakhsh MR and Salavati M (2008). The relative effect of mechanical factors in the incidence of back pain. *Kowsar Medical Journal* **9**(1).

Asghari Moghaddam MA (2010). Controlling chronic pain: Application of psychological methods. *Proceedings of the Third Congress of Psychology*.

Bagheri G (2004). Educational pamphlets on health and sports science center of Qom.

Fallah R, Gulzari M, Dastani M, Zahiroddini AR, Mousavi M and Ismail Akbari M (2011). The effectiveness of spiritual group therapy on mental health promotion and hope for in female patients with breast cancer. *Journal of Clinical Psychology* **5**(19).

Gatchel A and Turk D (2002). *Psychology of Pain*. Mohammad Ali Asghari Moghaddam, Bahman Najjarian, Mohsen Mohammadi, and Seyyed Mohammad Dehghani Mohsen Mohammadi, Translation (Roshd Publications).

Golchin N (2010). The Effectiveness of CBT to improve mental health and reduce pain in patients with chronic back pain. Master's Thesis, Tehran PNU.

Janbozorgi M, Golchin N, Alippour A, and Agah Hariss M (2013). The effectiveness of cognitive-behavioral group therapy in reducing pain and psychological distress in female patients with chronic back pain. *Iranian Journal of Psychiatry and Clinical Psychology* **19**(2) 102-108.

Mehrabian N (2009). The effectiveness of cognitive-behavioral intervention of pain and anger control on reduction of depression, anxiety and daily routines dysfunction in patients with chronic back pain compared to the control group. Master's Thesis in Clinical Psychology, Shahed University.

Motahari J (2001). Towards mental health. *Journal of Knowledge* **46** 20-28.

Nasseri M (2004). Evaluating the effectiveness of CBT in reducing depression, pain perception and dysfunction of patients with arthritis. Master's Thesis in Clinical Psychology, Tehran University of Social Welfare.

Nejat H and Irvani M (1999). The concept of mental health in schools of psychology. *Mental Health Quarterly* **1**(3) 160-166.

Otis JD (2007). *Practical Handbook of Cognitive - Behavioral Therapy for Chronic Pain*. Farzaneh Mohammadi and Nada Ali Begay (2011) Translation, (Tehran: Arjmand Publications).

Rahimian Bougar E and Tabatabaian M (2011). The effect of cognitive-behavioral group therapy on depression in patients with chronic back pain: A four-month follow-up. *Koomesh* **42**.

Rahimian Bougar E (2011). The effect of cognitive behavior group therapy on improving multidimensional pain symptoms in patients with chronic back pain: A four-month follow-up. *Scientific and Research Journal of the Islamic Republic of Iran Army's University of Medical Sciences* **9**(3) 199-208.

Rajabi GR and Attar A (2002). Psychology of pain etiology: assessment and treatment. *Psychotherapy News* **25-26** 70-95.

Rezaei M (1999). The relationship between job stress and mental health due to moderating effects of hardiness and social support. Master's Thesis, Institute of Psychiatry, Tehran.

Rezaei S, Afshar Nejad T, Kafi M, Soltani R and Fallah Kohan S (2009). The relationship of depression and pain coping strategies among patients with chronic back pain: a cross-sectional study by controlling pain severity and duration. *Scientific-Research Bimonthly Shahed University* **16**(81) 63-74.

Rezaei S, Yousef Zadeh S, Afshar Nejad T, Asghari Moghaddam MA and Zarabi H (2011). Determining psychological factors associated with disability in patients with chronic back pain. *Journal of Clinical Psychology* **3**(1).

Rezai F, Kajbaf MB, Vakili Zarch N and Dehghani F (2011). The effectiveness of cognitive behavioral stress management on general health of asthmatic patients. *Knowledge & Health Quarterly* **6**(3).

Sajadian I (2012). PhD dissertation in General Psychology, University of Esfahan.

Sanderson C (2013). *Psychology of Health*. Farhad Jamhari *et al.* Translation, (Sarafraz Publications).

Research Article

Sarafino EP (2003). *Psychology of Health*. Elaheh Mirzaei Translation, (Tehran, Roshd Publications).

Vakili N, Neshatdoust HT, Asgari K, Rezai F and Najafi MR (2009). The effect of cognitive-behavioral group therapy of pain management on depression in women with chronic back pain. *Journal of Clinical Psychology* **1**(4) 11-19.

White CE (2010). *Cognitive - Behavioral Therapy for Chronic Medical Diseases: A Practical Guide to Assessment and Treatment* /Craig, A. White, Reza Moloudi, Katayoun Fattahi, Translation, (Tehran, Arjmand Publications).