

The efficacy of Cognitive Behavioral Therapy in patients with chronic musculoskeletal pain

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Abstract

Introduction:

Chronic pain is one of the most prevalent reasons of referral to health centers. Cognitive Behavioral Therapy (CBT) has been shown to be an effective treatment for chronic pain. The current study was conducted to evaluate the efficacy of Cognitive Behavioral Therapy in patients with chronic musculoskeletal pain.

Materials and Methods:

CBT was evaluated in 8 sessions of up to 50 minutes in 4 patients with chronic musculoskeletal pain. A multiple baseline with a follow up of 1 month was used. Patients were randomly allocated to baselines and outcome and assessed via Beck Depression Inventory (BDI), Pain Catastrophizing Scale (PCS), Visual Analogue Scale (VAS) and Cognitive Coping Strategies Inventory (CCSI).

Results:

Results showed that Cognitive Behavioral Therapy was effective in reduction of depression, pain Catastrophizing and pain intensity, and improvement of coping strategies. These effects were maintained to some extent in the follow up.

Conclusion:

Psychological as well as medical treatment can be helpful in the patients with chronic pain.

Keywords: Cognitive Behavior Therapy, Pain, Depression, Catastrophization

Introduction

Human being suffers pain at any age with no exclusion. According to definition by international pain society 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'. This characteristic is a multifactorial concept comprising

cognitive, emotional and environmental elements (1).

Pain is different with respect to etiology, associations, and effects. In one sense, pain is classified as periodic, acute, or chronic. The chronic pain is a pain whose relief takes more than expected usual. According to international association of pain criteria, the time course of this kind of pain is at least 3 and 6 months for research

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and clinical purposes respectively (1). The prevalence of chronic pain during a life time period is between 11 to 84 percent (2). The prevalence of continuous and recurrent chronic pain in Iran is estimated to be 14 and 15 percent respectively (3). Chronic musculoskeletal pain is a common disease in public and 17 to 35 percent of adult general population report disabling musculoskeletal pain (1, 4). Chronic pain, in addition to its prevalence, impacts significant personal and societal financial burdens. In a study performed in USA, 2001, the prevalence of chronic pain was estimated to be 25 to 30 percent and the fiscal expenditures was above 150 billion dollars. Even with advanced medical and therapeutic methods, the pain relief is only by 35 percent (1).

It is generally agreed that physiologic factors may not solely interpret the perceived pain but also psychological factors should be contributing. In the 20th century, following failure of medical treatment of pain, the trend toward psychological approaches gained favor (5). Use of psychological therapies has increased exponentially in the classic field of medicine. One major reason for taking such approaches into account is their efficiency in combat against recurrent medical problems such as chronic pain. Psychologists had a prominent role in understanding the concept of pain. It is generally accepted that about 20-25 percent of patients with chronic medical complaints suffer significant psychological syndromes (6).

Chronic pain is usually associated with psychological outcomes such as depression, anxiety, isolation, disappointment, frustration, anger, and psychological disturbances such as sleep disorders, mood disorders, dysfunction in daily activities, and apprehension (1). Almost half the individuals with chronic pain show depression signs, which is only present in 2-9 percent of general population (7). These findings indicate psychological interventions in such

patients. Hypnotism, relaxation, cognitive therapy, and behavioral therapy are common approaches to chronic pain. Currently, cognitive behavioral therapy is the mainstay of non-medical treatments for chronic pain (7). The fundamental process in the cognitive behavioral therapy is the change in thought and behavior of patients (8).

Behavioral changes are obviously the major element in adaptation of an individual with chronic pain. However, cognitive intervention is the first step in the treatment of those with chronic pain, especially with tendency to keep distorted and inefficient beliefs about their pain. Cognitive aspect of pain is fairly correlated with its emotional aspects. Incorrect beliefs about pain, fear from pain, the degree to which someone is expecting pain, and cognitive evaluation as to the real or whimsical outcomes of pain, especially catastrophization on pain, are involved in depression and are responsible for emotional confusion in patients (2).

Catastrophization is a major predictor of the therapeutic outcome in chronic pain (9). Catastrophization is an emotionally negative perception of pain including magnification, insolvency, and cynicism. Catastrophization is significantly related to pain and depression (9). Catastrophization and acceptance of pain are important factors in prediction of depression resulting from chronic pain (10).

Counteracting pain is another important factor in coping with chronic pain and refers to a directed effort comprising both active and passive strategies in order to manage pain or alleviate its consequences, irrespective of them being successful (11). Most strategies for combat with pain are characterized by actions taken for alleviation, mitigation, or avoiding pain (12, 13). Drafts for assessment of battle with pain include negative beliefs about pain, fear, anger, or catastrophization of pain (13). Gender difference in pain experience is extensively recognized.

Women generally report more clinical pain and are more sensitive to it (14).

Finally, it should be said that chronic pain not only is a disease of an individual and their body, but also is accompanied in their environment, either as small dimension as their family or as large as the society, by remarkable adverse consequences. Psychological treatments not only reduce depression, catastrophization, frustration, anger, and so on in these patients but also increase the coping mechanisms, strategies to counteract pain and accepting it, and return to society. In this way the need to recurrent attendance to medical centers and the financial burden of such a presence is reduced.

Several researches have performed in Iran but none had considered the catastrophization variable which is both a corner stone for development of depression and a predictor of therapeutic outcome. The present study is trying to recognize the effect of cognitive behavioral therapy in the form of individual psychotherapy using multiple baseline method in patients inflicted by chronic musculoskeletal pain disease. One important question in this research is whether cognitive behavioral therapy is efficacious in treatment of individual patients with chronic pain.

Materials and Methods

This research is a single case study with multiple baseline method. Single case studies are valuable clinical studies. The sample size of this study included patients with chronic musculoskeletal pain disease attending to pain clinic, Imam Husain Hospital, Tehran, Iran. They were four patients with the diagnosis of chronic pain who presented in the first half of 2009. Sampling was simple nonrandom sequence.

After examination by a pain subspecialist and the implication of psychological components, patients referred to a psychiatrist. Of these, patients with the diagnosis of depression were selected and

interviewed. The inclusion criteria and inclination of patients for participation were considered at this stage and with informed consent the patients were chosen for the clinical study.

The inclusion criteria are as follows: absence of critical conditions such as infections, or malignancy; age between 18 to 45 years; no indication for surgical intervention; and literacy for accomplishment of the questionnaires.

Exclusion criteria are as follows: history of more than two surgical interventions; drug abuse; lack of psychological mind; and incompetence at cognitive-behavioral assessment.

Based on the mentioned criteria we selected four (three female, one male) out of fifteen screened patients with chronic pain and started treatment process.

Data were gathered at multiple stages. Scores related to depression, counteracting strategies, and pain catastrophization evaluated in the pretreatment session, and 2nd, 4th, 6th, and 8th sessions. The visual analogue scale examined at each session.

The examinees entered the study by two baselines. Eight sessions of cognitive behavioral therapy were held on an individual basis. The pretest score was calculated based on the average scores of the baseline. In table 2 mean and standard deviation (SD) of scores are presented for both the treatment course and follow up period for each examinee.

Data Analysis

In the following tables the demographic features and mean and standard deviation of the scores calculated for Beck depression inventory, pain catastrophizing scale, visual analogue scale, and cognitive coping strategies inventory are presented. Research hypotheses are introduced based on stepped multiple baselines plan and graphs for changing in the scores of each examinee at pretest, during treatment, and posttest phases are illustrated. These may point to the efficacy of cognitive behavioral therapy in depression,

catastrophization, pain intensity, and coping strategies.

In this study we used Beck depression inventory, pain catastrophizing scale, cognitive coping strategies inventory, and visual analogue scale.

Results

Table 1 presents some demographic feature of the participants.

Table 1. Demographic features of the participants

	Age	Sex	Marital status	Education	Vocation	Site of pain	Duration of pain
1 st examinee	36	female	Married	BSc	Employee	Back	5 years
2 nd examinee	23	Female	Single	High school diploma	Housewife	Neck and back	3 years
3 rd examinee	48	Female	Married	High school diploma	Housewife	Neck and back	4 years
4 th examinee	36	Male	single	High school diploma	Freelance	Neck and shoulder and back	3 years

Table 2. Mean and SD values at pretest, posttest, and follow up periods

Measures	Pretest		Posttest		Follow up	
	Mean	SD	Mean	SD	Mean	SD
Depression	30.75	3.09	9.75	3.09	12.75	4.57
Catastrophization	44.37	5.34	19.25	6.84	20.25	8.6
Pain intensity	8.62	0.85	3.5	0.577	3.8	0.83
Coping strategies	62	10.10	114	14.4	112	12.8

The data demonstrates that the scores in Beck depression inventory were moderate to severe. Data analysis showed that the first hypothesis is correct and cognitive behavioral education is effective in reduction of depression scores in the posttest stage. The treatment effect was persistent in the first three participants but not the 4th one. Figure 1 depicts depression scores of patients in each phase.

Regarding table 2 and the second hypothesis, all the patients had reduced scores in the pain catastrophizing scale which is translated to the efficacy of this approach. This effect persisted up to one month later. The scores for this scale are depicted in figure 2.

Based on the third hypothesis and data derived from patients, pain intensity was reduced after treatment and continued in

the follow up period. Thus, it can be deduced that cognitive behavioral therapy is effective in reducing pain intensity. Figure 3 illustrates scores in this category for pretest, treatment, and the follow up period.

According to fourth hypothesis cognitive behavioral therapy is effective in improving the coping mechanisms with chronic pain and the results clearly point to this premise especially considering the posttest and follow up scores. The scores related to coping strategies is shown in figure 4.

Discussion

The aim of this study was to evaluate the efficacy of cognitive behavioral education in patients with chronic musculoskeletal pain.

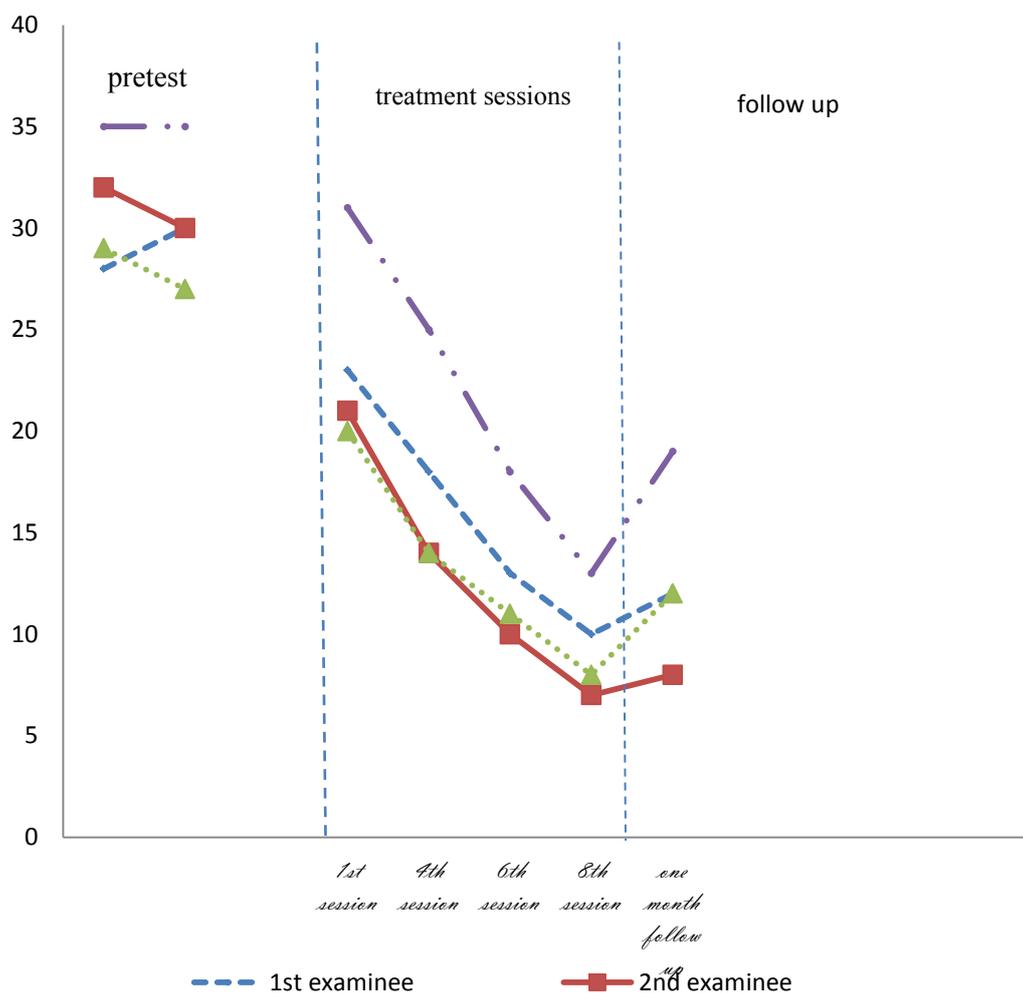


Figure 1. Depression scores in the pretest, treatment, and follow up phase

The results of our study are experimental support of this hypothesis and are congruent with the previous studies demonstrating the efficacy of cognitive behavioral therapy in reducing pain intensity (16-19), improvement of coping strategies with pain (17, 18), improvement of mood condition and reduction of depression (16, 17, 19), reduction of pain catastrophizing and a change in beliefs related to pain (17), and reduction of negative self-conversations and depression (18).

The depression is reduced in all patients at cognitive behavioral intervention phase and at posttest phase in comparison to pretest. The efficacy of treatment was persistent except for one patient. The increased scores in follow up period may

be attributed to dismissing cognitive techniques in this period. Also, according to Beck's cognitive theory, the stressful events may activate inefficient beliefs and a period of depression. On the other hand, insignificant changes in inefficient beliefs and extreme thinking, both predict shorter length of time for return of depression signs (19).

According to previous studies, the individual evaluation of pain and their ability to control over pain and life in general, modifies the relation between pain and depression (18). Accordingly, it is possible to attribute reduction of depression in our patients to increased ability of pain control. It is also possible that decreased depression is a result of antidepressant drug administration.

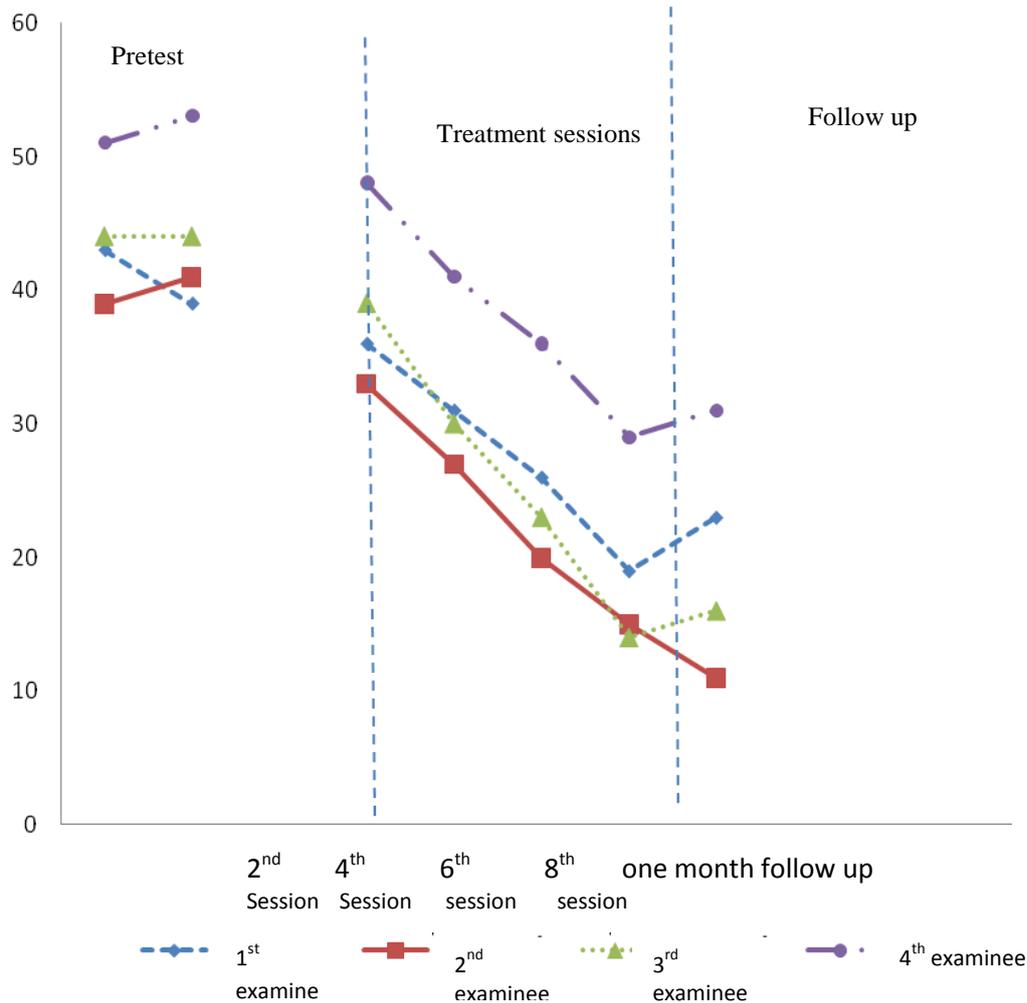


Figure 2. Scores of pain catastrophizing scale in pretest, treatment, and follow up period

The findings of our study is consistent with studies demonstrating the efficacy of cognitive behavioral therapy in comparison to common medical therapies as to reducing depression, pain intensity, and improved functional capacity (17, 20). The catastrophization of pain after treatment and in the posttest reduced significantly in three patients. It also reduced in the fourth patient and remained through follow up period. Our findings are quite similar to the findings of studies demonstrating efficacy of short term cognitive behavioral therapy in pain management and reduction of pain catastrophization (11, 17).

Based on our results, the pain intensity is reduced in session eight and remained lower in follow up period in comparison to pretest stage. This finding is consistent with the results of researches that show efficacy of cognitive behavioral or behavioral pain management programs in reducing pain intensity (17, 18). Reduction of pain intensity may be resulted from reduced catastrophization, increased control over pain, efficacy of cognitive behavioral education, and consumption of Gabapentin.

We also found that cognitive behavioral therapy is effective at improvement of coping strategies with pain.

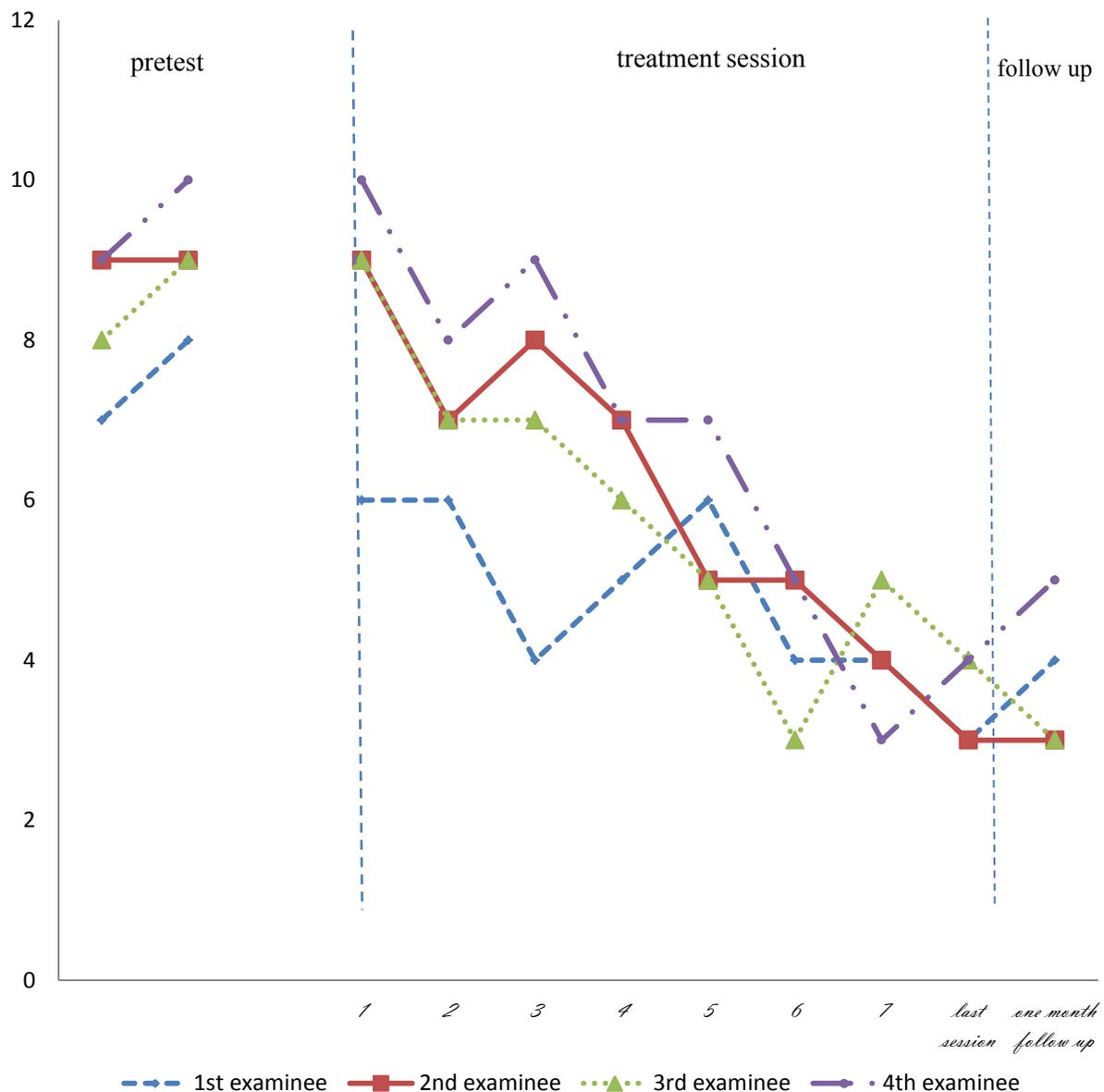


Figure 3. Scores of the pain intensity in pretest, treatment, and the one month follow up period

The more active the counteracting strategies against pain, the more capable become a patient in coping with pain. Increased scores relative to pretest scores may be attributed to the efficacy of education and adherence to therapeutic techniques such as counteracting self-conversations (relaxing internal conversation, attention deviation, and

activation of usual senses) and decreased catastrophization as a micro-measure in coping strategies criteria. Our findings are essentially similar to the results of previous studies about the efficacy of multi-model cognitive behavioral therapy in improvement of counteracting strategies against pain at workplace (17, 21).

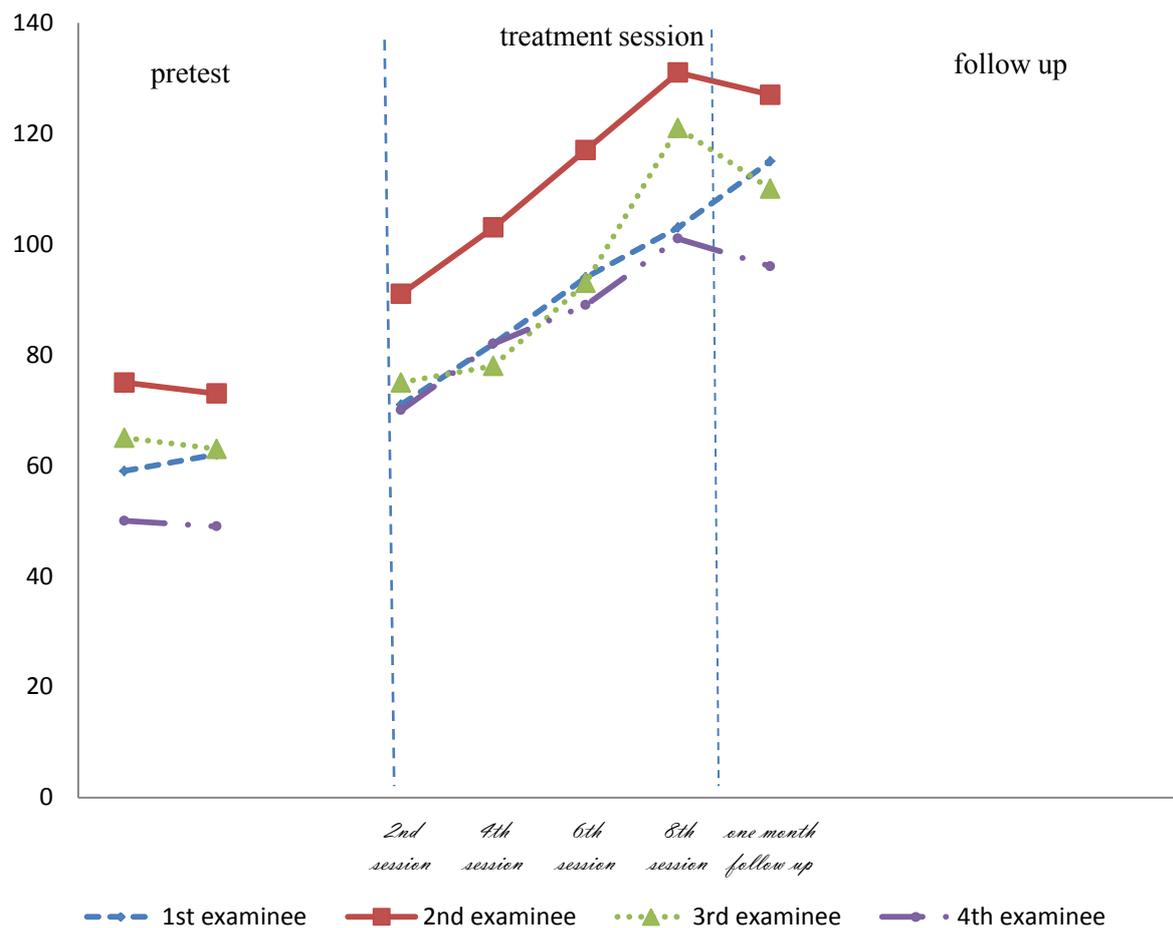


Figure 4. Scores related to coping strategies with pain at pretest, treatment, and one month follow up period

Conclusion

According to the results of our study and previous researches, cognitive behavioral therapy is effective in patients with chronic pain through reduced emotional confusion (depression, anxiety, anger, etc.), increased pain management, increased sense of self-efficiency, decreased disability resulting from pain, improved cognitive and behavioral strategies counteracting pain, acceptance of pain, and reduced catastrophization of pain.

Overall, it is concluded that cognitive behavioral therapy, as an adjunct to classic medical treatments, may enhance the therapeutic yield.

Limitations

This study was performed on an individual basis and there was no control over or participation of the family members. It is possible that one reason for scores observed in follow up period is the inability to control environmental stresses. Lack of long term follow up and heterogeneity of gender are other limitations which may affect our results.

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