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Pain and depression in women with rheumatoid arthritis: The effect of cognitive behavioral therapy

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Original Article

Abstract

BACKGROUND: Pain is the main symptom of the disease in patients with rheumatoid arthritis (RA). This disease is the most common arthritis identified in women. Many studies have stated that there is a relationship between chronic pain and depression. The aim of this study was to examine the efficacy of the cognitive behavioral therapy (CBT) on reducing pain and depression in women with RA.

METHODS: Four patients with RA were included in a single-subject study with multiple baseline design conducted in Tabriz, Iran, in 2017. Scores were measured with Beck Depression Inventory (BDI) and McGill Pain Questionnaire (MPQ) before and during treatment periods.

RESULTS: The effect sizes according to the results of the BDI for the first, second, third, and fourth subject were 5.00, 0.66, 5.00, and 6.00, respectively. The effect sizes of the MPQ for the first, second, third, and fourth subject were 2.24, 3.44, 5.74, and 2.79, respectively.

CONCLUSION: The symptoms of depression are high among patients with RA due to chronic pain. CBT significantly reduced pain and depression in patients with RA. CBT is a great help in reducing the physical and mental problems of patients with RA.

KEYWORDS: Cognitive Behavioral Therapy; Pain; Depression; Rheumatoid Arthritis

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Introduction

1-5 percent of the adult population has rheumatoid arthritis (RA) and this disease is known as an autoimmune disease.[1] The most common symptoms are pain, stiffness, swelling, and loss of motion in the affected joint. Other common symptoms are fever, weakness, and loss of appetite.[2] In most cases, RA involves disability, pain, limitation of activity, and limitation of social participation, which greatly affects the physical, psychological, and social level of the individual and requires multi-dimensional assessment.[3] The biopsychosocial model of diseases shows that although biologic factors affect chronic pain, psychological and social factors are also considered to be effective.[1]

The pain is multidimensional, defined by the International Association for the Study of Pain (IASP) as "unpleasant sensation and emotional experience associated with actual or potential tissue damage, or described in terms of such damage".[4] Pain with psychosocial distress can interfere with social and physical function and increase the need for health care. The prognosis of pain in this disease is poor; even when inflammatory disease is well controlled, pain control is the best treatment.[5]

Symptoms of depression are known as a major problem in one-fourth of the patients with RA.[6] These patients have poor mental

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health. There are high levels of depression and anxiety in these patients compared to healthy people. Depression is a mediator between the pain and the impaired cognitive function in both early and late RA.[5] In particular, depression in patients with RA is an independent risk factor for cardiovascular disease (CVD) and myocardial infarction (MI), suicide, and death, even after a period of control for RA disease, illness, activity, disability, and pain. In addition to negative health outcomes, depression can help unemployment, loss of labor productivity, and increased health care costs in people with arthritis.[7]

Cognitive behavioral therapy (CBT) is known as an effective treatment and is known to treat chronic pain and mood disorders. It is helpful as an effective treatment combined with medical treatment in RA.[8] Despite the significant impact of CBT on health promotion, few studies have been conducted on the effect of CBT on pain relief and depression in patients. The results are also contradictory; a meta-analysis showed that treatment of chronic back pain had a positive effect on tolerance, dependence on pain, involvement in activities, quality of life, and depression.[9] In another study, no superiority was observed with respect to control conditions and CBT was not useful.[10]

Given that the research background on CBT studies is limited in patients with RA, considering the elimination of this conflict which simultaneously reduces depression and pain, and given the importance of the stated cases, the main question of this study is whether CBT is effective in reducing pain and depression in women with RA.

The hypotheses of this study were:

1) Women with RA suffer from depression.

2) Depression symptoms in women with RA decrease after CBT.

3) Pain in women with RA decreases after CBT.

Materials and Methods

In this research, with regard to the aim and limitations available for conducting the research, a single-subject experimental test with a multiple baseline design has been used, in which observation has been performed with repeated measures. The study population consisted of all women with RA that were referred to Sina Hospital, Tabriz, Iran, in 2017, among whom, 4 women were randomly selected. Subjects were also interviewed by a specialist physician to ensure that they had chronic pain criteria. Then, these subjects received cognitive therapy for eight sessions of 90 minutes. At the end of the sessions, they were evaluated by Beck Depression Inventory (BDI) and McGill Pain Questionnaire (MPQ).

In this study, graphic charts, tables, calculation of the effect size by Cohen's d, and reduction percentages were used to analyze the results. The summary of the items discussed at the psychotherapy sessions included:

Session 1: Basic familiarization and introduction, discussion on the effect of pain, the conceptualization of pain, familiarity with the symptoms of depression and psychosocial issues of pain and depression, the presentation of the treatment process, the goals of treatment.

Session 2: Reviewing the task of the previous session, introducing the cycle, expressing the theory of pain control, what causes the closure of the pain gate and what causes it to open, teaching planning activities and training and programming for enjoyable activities, presenting the new task.

Session 3: Reviewing the task of the previous session, explaining your thoughts, explaining how the thoughts lead to excitement, understanding the relationship between excitement and pain, detection of the relationship between depression and pain, muscle relaxation, and giving a task.

Session 4: Reviewing the task of the previous session, evaluating inappropriate thoughts, reviewing the subjects' thoughts,

cognitive error, thinking patterns based on wrong assumptions or misconceptions, presenting the new task.

Session 5: Reviewing the task of the previous session, identifying the evidence and indicating the negative aspects of subjects' thoughts, diverting attention through pleasurable activities, presenting the assignment.

Session 6: Reviewing the task of the previous session, stress and controlling it, replacing the right rationale instead of uncorrected thoughts, muscle relaxation, presentation of the new task.

Session 7: Reviewing the task of the previous session, explaining about anger and wrath, social skills training, concluding and summarizing sessions.

Session 8: Sleep hygiene and ways to improve sleep, an overview of previous sessions.

Measurements

BDI: The BDI is a 21-item tool. Each item is ranked based on a 4 point Likert scale from 0 to 3 based on severity over the past two weeks. The overall score is between 0 and 63, with higher scores indicating severe symptoms of depression. The overall score of BDI of 0-13 was considered as minimum depression, 14-19 mild depression, 20-28 moderate depression, and 29-63 severe depression. The validity and reliability of this test is high, so that the Cronbach's alpha is 0.80 and it has the ability to separate patients from normal people.[11]

MPQ: The MPQ is one of the most common pain assessment questionnaires. This test has high validity and reliability.[12,13]

Ethical issues: Participants were satisfied and informed consent was obtained from all participants included in the study. The written informed consent was obtained from the patients for publication of this study. This study was approved by the local ethics committee.

Results

Participants included four married housewives with an average age of 40 years, often having high school education. The effect size was calculated using a method based on the standard mean and standard deviation (SD) (Cohen's d). The effect size above 0.8 shows that the therapeutic effect is high, the values between 0.5 and 0.8 represent a medium effect size, and between 0.2 and 0.5 represent a low effect size. Quantities less than 0.2 also indicate that treatment has not been effective.[14]

The results of changes in the subjects' scores in the pre-test and post-test of the BDI are presented in table 1.

The results of changes in the subjects' scores during the pre-test and post-test of MPQ are presented in table 2.

Figures 1 and 2 of the subject's scores are drawn based on the BDI and the MPQ.

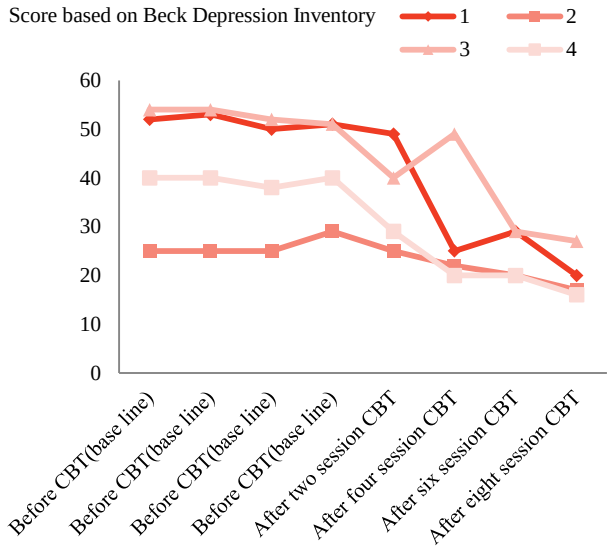

Figure 1. Subjects' scores based on the Beck Depression Inventory (BDI)

Discussion

The purpose of this study was to investigate the effect of CBT on decrease of pain and depression in women with RA. According to the first hypothesis of this study, women with pain in RA suffer from depression, which according to table 1, in all subjects with a history of RA, depression was high in pre-CBT, which is consistent with other research done in this area.[3,5,7,15]

Table 1. The results of changes in the subjects' scores in the pre-test and post-test of the Beck Depression Inventory (BDI)

Subject	Before CBT (baseline)				After two sessions of CBT	After four sessions of CBT	After six sessions of CBT	After eight sessions of CBT	Mean ± SD (baseline)	Mean ± SD (therapy stage)	Effect size (baseline-therapy stage)	Reduction percent
1	52	53	50	51	40	29	25	20	51.50 ± 1.29	28.50 ± 8.50	5.00	60
2	25	25	25	29	25	22	20	17	26.00 ± 2.00	21.00 ± 3.36	0.66	41
3	54	54	52	51	40	40	29	27	52.75 ± 1.50	34.00 ± 6.97	5.00	47
4	40	40	38	40	29	20	20	16	39.50 ± 1.00	21.25 ± 5.50	6.00	60

CBT: Cognitive behavioral therapy; SD: Standard deviation

Table 2. The results of changes in the subjects' scores during the pre-test and post-test of McGill Pain Questionnaire (MPQ)

Subject	Before CBT (baseline)				After two sessions of CBT	After four sessions of CBT	After six sessions of CBT	After eight sessions of CBT	Mean ± SD (baseline)	Mean ± SD (therapy stage)	Effect size (baseline-therapy stage)	Reduction percent
1	92	90	92	91	85	80	70	60	91.25 ± 0.95	73.75 ± 11.00	2.24	19
2	70	70	71	71	65	60	55	55	70.50 ± 0.60	58.75 ± 4.78	3.44	16
3	95	95	94	95	75	75	65	60	94.75 ± 0.50	66.25 ± 7.00	5.74	30
4	80	81	82	82	75	65	65	55	81.25 ± 0.95	65.00 ± 8.16	2.79	20

CBT: Cognitive behavioral therapy; SD: Standard deviation

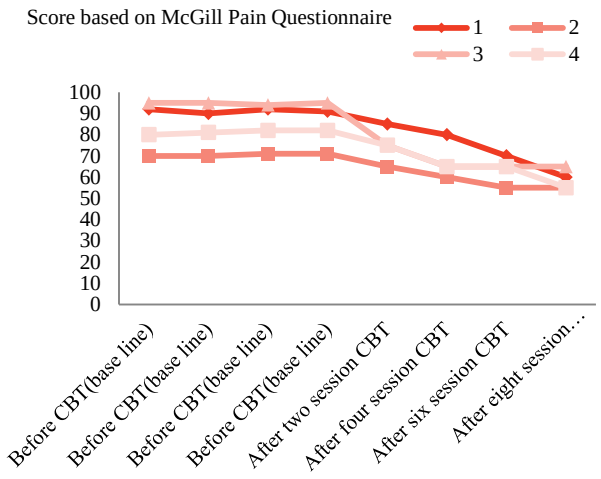

Figure 2. Subjects' scores based on the McGill Pain Questionnaire (MPQ)

Patients with RA, as a result of motor limitation and reduced daily activity, suffer from physical, psychological, and social impairment and become depressed. The study found that patients with RA suffer from depression. Depression and stress play a role in the incidence and continuity of the disease. Patients who are in the off stage of the disease will be relapsed if they cannot control their depression and loneliness. Pain in RA predicts depression. Patients with a history of depression are more likely to have worse RA pain than those who do not have such a history.[16,17]

According to the second hypothesis, depression symptoms in women with RA decrease after CBT. According to the data from table 1, based on the results of BDI, for three subjects who received CBT, the effect size was high and for the other subject, the effect size was calculated medium and the second hypothesis of the study was confirmed. The effectiveness of CBT has been studied in several groups and the findings of this study are in line with these results[2,18] and are not consistent with Parker et al.'s findings.[6] In explaining this finding, it can be said that CBT helps the patients control problems by changing the irrational beliefs, emotions, and behaviors and increase in alternative activities and sense of self-efficacy. The core of CBT for reducing depression is that people's mood is directly related to their mental patterns, and the negative thinking and application of it leads to the mood and behavior and even the physical state of individuals, so the mood of people with RA has a relationship with their unpleasant and negative thoughts. Consequently, CBT helps these individuals rebuild their thinking patterns and replace them with positive thinking practices which reduce the symptoms of depression. In eight sessions of the CBT, the patient is assisted in identifying the automatic thoughts and distinguishing between her thoughts and her feelings. The behavioral vagaries and even the physiological response can be understood.[2]

According to the data obtained from table 2, based on the MPQ, for four subjects who received CBT, a high effect size was achieved and the third hypothesis of this study was confirmed. The results showed that CBT could be used as a suitable therapeutic approach in these patients, which is consistent with previous findings showing the effect of CBT on the reduction of pain in patients with chronic pain.[19,20]

In explaining this, care should be taken to reduce physical pain alone and it should be noted that chronic pain is more than a physical cause, and the continuation of this pain leads to widespread and painful problems such as weakening of the mood, emotional disturbance, limitation of social and professional activities, increased use of medications, frequent referral to the health department, and the development of the role of the disease in other parts of the life of the individual. Since cognitive processes such as attention, attributes, and emotional processes such as pain-related fears and safety-seeking behaviors affect pain behaviors and disability levels, teaching cognitive-emotional components in CBT can lead to correction of

these processes and as a result, key components to increasing effective coping.[21] Providing information related to pain in its cognitive processing as well as educating distraction techniques can lead to reduced pain, and also CBT and its application causes patients to worry less about pain and to engage in active encounter with it control over.[22] The limitations of this research include low number of subjects, female subjects, and use of self-reporting tests. It is recommended that studies on chronic pain in men and women with other chronic diseases such as chronic back pain be performed. Therefore, further research in this area leads to the discovery of the relationship between pain and depression in other chronic diseases and more about the effectiveness of this treatment in reducing pain and other psychological disorders in other diseases.

Conclusion

According to the findings, high effectiveness of CBT has been achieved in reducing pain intensity and depression. CBT seems to be a very suitable approach for patients with health problems and medical treatment issues. The effectiveness of this treatment can be used to increase the quality of life of patients. Physicians, nurses, and health psychologists should measure mental health of patients in diagnostic priorities. CBT is a great help in reducing the physical and mental problems of patients with RA. Psychological training emphasizes that the patient can have better choices even in the condition of the disease.

Conflict of Interests

Authors have no conflict of interests.

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