

## Research Article



# The Effectiveness of Mindfulness-based Self-care Education and Stress Reduction Therapy on Pain Management Strategies in Patients with Rheumatoid Arthritis

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## Abstract

**Background:** Development of psychological skills can be used to improve physical illnesses. Pain management strategies are one of the most important psychological skills and strategies that can help improve the disease. We aimed to investigate the effectiveness of self-care education and mindfulness-based stress reduction therapy on pain management strategies in patients with rheumatoid arthritis (RA).

**Methods:** The statistical population of the study included patients with RA referred to rheumatology centers in Isfahan, from which 30 people were selected as a sample. In the study, the effect of two interventions of self-care education and mindfulness-based stress reduction therapy on coping strategies was evaluated and compared.

**Results:** The results showed that self-care training could have a significant effect on coping strategies ( $P=0.001$ ). Mindfulness-based stress reduction therapy also had a significant effect on coping strategies ( $P=0.005$ ) and comparing the effectiveness of two interventions showed that self-care training was significantly more effective than mindfulness-based stress reduction therapy on coping strategies in patients with RA.

**Conclusion:** Self-care training was more effective than mindfulness-based stress reduction therapy on coping strategies, and in general, both interventions were able to improve coping strategies in patients.

**Keywords:** Rheumatoid arthritis, Mindfulness, Pain, Self-care

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## Background

Arthritis is defined as the inflammation of joint, associated with swelling, pain, stiffness, and limited mobility which usually damages the joints of hands and feet and intensifies with age (1). Side effects of this disease include physical disorders and pain such as bone corrosion and joint deformity, accelerating the body's metabolism and weight loss, inability to use other organs, and extra articular manifestations such as hearing disorders, nervous tensions such as depression and anxiety (1).

There is a growing awareness that rheumatoid arthritis (RA) is influenced by psychosocial factors such as self-efficacy that affect the process of the disease. Self-efficacy has been widely studied as a strong and potential correlate of disease outcomes, and an important factor in the continuation of chronic health behaviors (2, 3).

Almost all chronic pain therapies, including medications, surgery, and cognitive therapies, have been

used to relieve pain, but sometimes these treatments do not help, whereas self-care education and stress reduction therapy may be more helpful on pain management. In recent decades and in the third generation of psychological therapies, new therapies have been developed that use meditation to help side effects (1, 4).

However, despite the many benefits of educating the patients, it is still neglected in health care centers. Investigations show that patients' education in Iran is either not implemented or is incomplete and irregular. Given the importance of the presented materials and the existence of many problems in all aspects of patients with RA's lives, such as high treatment costs and adverse effects of medicine-based treatments, it seems that stress reduction training based on mindfulness and self-care training may lead to effective results (5).

Therefore, we aimed to answer the fundamental question of whether self-care education and mindfulness-



based stress reduction therapy are effective on pain management strategies in patients with RA.

## Material and Methods

This study was a quasi-experimental study with pre-test post-test design with control and intervention groups. The statistical population of the study included all literate 20-60 year-old patients with a confirmed history of RA for at least 6 months, who referred to Isfahan University of Medical Sciences Rheumatology Center, for treatment between September and October 2019. Patients who suffer from acute psychological diseases or presence of mental disorders requiring immediate treatment, disruption of the normal course of treatment, lack of cooperation and severe physical disability were excluded. Considering these criteria, 30 patients with RA were finally selected as the sample.

Written consent was obtained from the patients who met the criteria and they were randomly assigned to experimental and control groups. Two processes of self-care education and mindfulness-based stress reduction therapy were applied on the experimental group, but nothing was done on the control group.

In the process of self-care education, patients changed to trained care givers that were able to protect themselves and understand the disease. To do this, they begun the process of self-protection and took responsibility for personal affairs related to the illness, such as checking medication, diet, and daily physical activity appropriate to their physical condition. In this stage of the study, based on the content of self-care treatment sessions shown in Table 1, risk factors and caring behaviors of patients with RA were identified.

In this stage, home exercise instructions were prepared for the patients in the form of a training pamphlet. These included joint protection techniques and exercises, such as neck contraction, shoulder lift, shoulder movements, biceps, shoulder flexor muscles, wrist range of motion, finger strengthening exercises, and flexibility. Patients were also provided with exercises such as strengthening the toes, stretching the muscles of the back of the legs and front and thighs, lifting a towel or handkerchief with the toes, increasing the range of motion of the ankle,

exercising the quadriceps, knees and pelvis.

In the second stage of the study, mindfulness training was done by training focus attention on a scene and perceptions, such as mindfulness focused on breathing, walking, and body examination exercises. Each training session focused on one area (movement, taste, smell, touch and sight) and related exercises. The purpose of the simple sensory exercises was to acquaint the subjects with the concept of mindfulness and its potential benefits and advantages in daily life. Continuing these exercises was encouraged in the form of weekly home exercises. In essence, mindfulness training is a mental training practice that teaches the patients to break out of habitual skills, let them avoid negativity, slow down racing thoughts, and prepare the ground for changes by directing information processing resources toward neutral goals. The content of eight sessions of stress reduction therapy based on mindfulness-based stress reduction is presented in Table 2.

After completing the steps of the study, cognitive and behavioral coping strategies were assessed using Rosenstein and Keefe coping strategy questionnaire (6). This questionnaire has 42 items and seven subscales and in fact six cognitive coping strategies (attention span, pain reinterpretation, self-talk, ignoring pain, catastrophizing and prayer-hope) and a behavioral coping strategy (increasing behavioral activity). Each of the subscales (strategies) consists of six expressions.

Rosenstein and Keefe, first standardized this questionnaire among a group of patients with chronic low back pain and the internal consistency coefficients of its seven subscales were reported to be between 0.71 and 0.85. Since then, this questionnaire has been used in many studies on both acute and chronic pain (7, 8). The results of these studies have confirmed the psychometric properties of the coping strategies questionnaire in the Iranian population. Cronbach's alpha coefficients of coping strategies of the Persian version of this questionnaire ranged from 0.74 to 0.83 (1, 9).

The subjects were asked to read each phrase carefully and use a seven-point scale (zero to six) to determine to what extent he/she has used each of these strategies when in pain. In addition to these six cognitive-behavioral

**Table 1.** Content of Self-care Training Sessions

Session	Aim	Process
First	Introduction and prognosis of rheumatoid arthritis	Description and anatomy of the disease and its process, prognosis, symptoms, complications, risk factors and effects of defects and shortcomings in the treatment plan
Second	Introducing self-care behaviors	Methods of preventing and controlling the disease, performing self-care behaviors (including nutrition, exercise and physical activity, joint care, controlling complications, and taking medication) and its importance were explained and discussed in simple language
Third and forth	Problem solving and presenting educational pamphlets	Problem-solving steps including: diagnosing the problem, explaining the goals, presenting solutions and choosing the best solution, and discussing how to implement the best solution, Coping with depression, going out with friends, expressing emotions, doing sports with family and friends, or watching fun and entertaining movies
Fifth	Educational participation	This stage is designed in such a way that the patient, as a health liaison, takes on the role of educating the family, so the patient briefly teaches the learned material to the family members in one session.



**Table 2.** Content of Mindfulness-Based Stress Reduction Sessions

Sessions	Session Description
First	Meditation and awareness practice, raisin eating technique, 45 minutes of body examination.
Second	Discussion of homework barriers to practice and mindfulness solutions for it, meditation and awareness training, presence of mind, 45 minutes of body meditation, sitting evaluation, breathing during the day. Homework: Do a body test for 45 minutes and increase the level of awareness of daily activities such as eating, bathing, sitting, and brushing.
Third	Discussion on homework, 45-minute meditation and body exams, myths about meditation and completing a calendar of pleasant events, 3-minute breathing space. Homework: recording a calendar of pleasant events, continuing daily activities with awareness, and practicing meditation
Forth	Review homework, practice 45-minute meditation and body exams, respond to stress, practice 1-minute breathing space, complete a calendar of unpleasant events, and continue daily activities. Homework: Complete a calendar of unpleasant events and practice 3 minutes of breathing space
Fifth	Check homework, practice 45-minute meditation and body exams, report 3-minute breathing space, complete a worksheet to focus on the interactions you have with important people in your life during the week. Homework: Completing the worksheet, communication sheet and daily activities with awareness.
Sixth	Assess homework, practice 45-minute meditation and body examinations, conflict management styles, discuss stress responses and reactions to difficult situations, and alternative attitudes and behaviors. Homework: 45-minute meditation exercises and body examinations, continuation of daily activities
Seventh	Homework review, 45-minute meditation exercises and body exams, discussion of the pain process, pain relief and anger processes, pain reporting. Homework: 45 minutes of meditation and body examinations, continuation of daily activities and reporting pain
Eighth	Homework review, 45-minute meditation exercises and body examinations, 3-minute breathing space, and talking about the accuracy of what they have learned so far. Asking questions about the whole session, such as whether it met the participants expectations. Does it feel like their character has grown? Do they feel that their coping skills have improved and do they like to continue meditating?

strategies, the questionnaire has two subscales that measure the ability to control and the ability to reduce pain. The scores of the 6 terms were added together and a combined score was obtained for each coping strategy. Higher scores on each coping strategy indicate greater use of the strategy when in chronic pain.

Participants were reassured that their private information was protected and that they were free to leave the study if there was any inconvenience at any stage of the research. For statistical analysis, t test, ANOVA, and Bonferroni post hoc test were used with significance level of  $P < 0.05$ . The analysis was performed using SPSS software, version 22.

## Results

30 patients with confirmed RA participated in the study. The patients were randomly assigned to each of the experimental and control groups. Table 3 shows demographic characteristics of the participants. There was no statistically significant difference between the groups with respect to disease duration, age, and gender.

Pre-test and post-test scores of the study groups are presented in Table 4. The results show that pre-test scores in the study groups were not statistically different. However, in the experimental group, post-test pain management strategy scores of self-care training and mindfulness stress reduction were significantly higher than pre-test scores ( $P < 0.05$ ), whereas the difference was not significant in control group.

We found that self-care training was significantly more effective than stress reduction therapy ( $P < 0.05$ ). Moreover, compared with the control group, stress

reduction therapy based on mindfulness and self-care training on effective coping strategies for patients with RA was significantly effective ( $P < 0.05$ ).

Bonferroni post hoc test results for identifying the differences between every two sets of data are show in Table 5.

Comparing stress reduction therapy based on mindfulness and self-care training shows that self-care training was significantly more effective than reduction therapy ( $P < 0.05$ ). Moreover, compared with the control group, stress reduction therapy based on mindfulness and self-care training on effective coping strategies for

**Table 3.** Demographic Characteristics of the Patients

Variable	Experimental Group (n = 15)	Control Group (n = 15)	P Value
Gender			0.713
Male	8 (53.3%)	9 (60%)	
Female	7 (46.7%)	6 (40%)	
Age <sup>a</sup>	43.91 ± 4.61	41.38 ± 3.82	0.623
Disease duration <sup>a</sup>	9.52 ± 4.36	10.27 ± 3.83	0.728

<sup>a</sup> Data are expressed as Mean ± SD.

**Table 4.** Mean ± SD pre- and Post-test Scores of the Study Groups

Study Groups	Pre-test	Post-test	P Value
Experimental			
Self-care training	120.9 ± 23.5	177.5 ± 21.3	0.023
Mindfulness-based stress reduction	118.2 ± 21.8	148.1 ± 27.9	0.003
Control	110.6 ± 23.1	111.4 ± 21.1	0.864
P value	0.788	0.001	



**Table 5.** Bonferroni Post-hoc Test for Pairwise Comparison Between the Mean Scores of Patients' Coping Strategies

Variable	Group (i)	Group (j)	Mean Difference	Standard Deviation	P Value
Pain coping strategies	Mindfulness-based stress reduction therapy	Self-care training	-29.4	10.6	0.031
	Self-care training	Control	66.1	10.6	0.001
	Mindfulness-based stress reduction therapy	Control	36.7	10.7	0.005

patients with RA was significantly effective ( $P < 0.05$ ).

## Discussion

Pain management strategies are among the psychological strategies that require psychological training and justification. In this regard, in present study the effectiveness of self-care education and mindfulness-based stress reduction therapy on pain management strategies in patients with RA was investigated. The results showed that self-care education and mindfulness-based stress reduction therapy had a significant effect on pain management strategies in patients with RA and self-care education was more effective than mindfulness-based stress reduction therapy. The results are consistent with previous studies (3, 10, 11).

Coping strategies are the decision, style, strategy, or method that a person makes in the face of daily stress. These strategies require psychological skills and awareness, which are also confirmed by the results of this study, so that self-care education and mindfulness-based stress reduction therapy were able to improve these strategies (12).

Chronic pain almost always causes changes in the beliefs of people with pain that shape the psychological aspects and perception of pain and illness (2). The likelihood of engaging in a particular health behavior is determined by two factors: (a) Beliefs about the effects of the disease and its consequences (risk perception), and (b) Beliefs about health behaviors and possibilities and the effort to put them into practice.

Many studies have been conducted with the aim of identifying the factors contributing to the occurrence of chronic pain, and all of them equally show that the patients' attitudes, beliefs and expectations about their illness condition, as well as the health care system affect the rate of pain, disability and the type of patient response to treatment (2, 12, 13). There was a strong correlation between coping responses with pain intensity, psychological health, and physical function (14). Stress is a trigger for RA, which also plays a role in the clinical course and effectiveness of the drug, and with continued stress, patients with RA would not have a good prognosis (15).

## Conclusion

Self-care training was more effective than mindfulness-based stress reduction therapy on coping strategies, and

in general, both interventions were able to improve coping strategies in patients. Therefore, it can be acknowledged that pain management strategies need education and awareness, which the findings of this study could confirm this issue.

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## Conflict of Interests

The authors have no competing interests.

## Ethical Approval

This experimental study was conducted with the approval of the Ethics Committee of the Islamic Azad University, Kish branch.

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