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The Effectiveness of Mindfulness-Based Stress Reduction Training on the Beliefs Related to Pain and Anger in Women with Rheumatoid Arthritis

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Abstract

Objective: This study aimed to investigate the effectiveness of mindfulness-based stress reduction (MBSR) training on pain beliefs and dimensions of anger in women with rheumatoid arthritis.

Method: The research design was quasi-experimental with a pre-test-post-test and a control group. The statistical population of the study consisted of women with rheumatoid arthritis referred to medical centers in Tabriz City in 2022. The sample included 25 women with rheumatoid arthritis selected through convenience sampling based on inclusion and exclusion criteria, who were then randomly assigned to two groups. The research instruments used were Williams and Thorne's Belief in Pain Questionnaire and Spielberger's State-Trait Anger Questionnaire, which were provided to both groups to collect the required data. The control group remained on the waiting list, while the experimental group underwent MBSR training over eight weekly sessions (90 minutes per week) following Jon Kabat-Zinn's approach. The research data were analyzed using multivariate analysis of covariance (MANCOVA).

Results: The results indicated significant differences between the MBSR and control groups in pain beliefs and anger. Specifically, MBSR treatment led to a reduction in pain-related beliefs and anger in the experimental group ($P<0.001$). Eta-squared values showed that 76.3%, 71.8%, 74.4%, and 69.6% of the variance in pain beliefs and anger could be attributed to the effects of MBSR, respectively.

Conclusion: Based on the findings, mindfulness-based stress reduction (MBSR) training can be considered as a complementary and protective treatment technique for patients with chronic and painful conditions such as rheumatoid arthritis.

Keywords: Mindfulness-Based Stress Reduction Training, Pain, Anger, Rheumatoid Arthritis.

Extended Abstract

Introduction and Objective

Rheumatoid arthritis is one of the chronic pain diseases that is accompanied by joint inflammation, erosive pain, dryness, and swelling in the joints. In Iran, the prevalence of rheumatoid arthritis in women has been reported to be 6 times higher (Jamshidh et al., 2019). Research showed that anger rumination was associated with cognitive helplessness, intense activity of the sympathetic system, and the experience of intense anger has a strong relationship (Takebe et al., 2017; Huntley et al., 2022). Also, Patients with rheumatoid arthritis have shown that pain is the most important independent determinant of the patient's perception of their disease activity (Studenic et al.,2012). In rheumatoid arthritis patients who had greater flexibility had better mental, social, and physical health (Russell et al., 2019).

Mindfulness-based cognitive therapy effectively improves pain beliefs (Mobseri and Davoodi, 2015), and psychological symptoms (Oliyani et al., 2022). Mindfulness-based therapy

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has been shown to reduce depression and aggression (Zahedi Rad et al., 2021), and reduce stress and increase quality of life and self-interest (Katyal, 2012). Cognitive therapy based on mindfulness has been shown to reduce psychological symptoms and pain intensity in patients with specific diseases (Naghibi et al., 2020), increase the quality of life and self-efficacy, and increase coping strategies (Daneshnia et al., 2021).

Given the high prevalence of rheumatoid arthritis and its psychological consequences, the limited research interventions in this field, the role of psychological variables in the prognosis and exacerbation of disease symptoms, and the introduction of psychological educational methods to improve the quality of life of these patients alongside drug therapy, this study is deemed necessary.

Materials and Methods

This semi-experimental study was conducted with a pre-test and post-test design with a control group. The statistical population of the study included all female volunteers with rheumatoid arthritis in Tabriz in 2022, with the high prevalence of this disease in women being the reason for selection. The study sample consisted of 25 women who were selected through convenience sampling, with 12 individuals randomly assigned to the experimental group and 13 to the control group. Inclusion criteria were: willingness to participate in the study, female gender, age between 30 and 60 years, education of at least one cycle, and duration of illness of at least one year. Exclusion criteria included a history of hospitalization in a psychiatric ward, use of psychiatric medications, and failure to complete the questionnaires. This research has been approved as a Master's thesis in Psychology at Islamic Azad University, Ardabil Branch.

To collect data, the following questionnaires were used: *Pain Beliefs and Perception Inventory (PBPI) and State-Trait Anger Expression Inventory (STAXI). Also,* in this study, the MBCR (Kabat-Zinn, 2005) was implemented in the experimental group once a week for 8 sessions of 90 minutes each. The MBCR protocol was used in this study as a group intervention

Results

The mean (standard deviation) of age for the experimental and control groups was 39.08 (2.99) years and 38.84± (2.37) years, respectively. The multivariate analysis of covariance shows a significant difference between groups in the persistence of pain (F=57.04), blame (F=123.8), consistency of pain (F=43.24), and mastery scores (F=19.11) (P<0.001). Eta-squared values indicate that 76.3%, 71.8%, 74.4%, and 69.6% of the variance in the persistence of pain, blame, consistency of pain, and mastery are attributable to the MBCR effects, respectively. Additionally, the results indicated a significant difference between groups in anger state (F=74.17), anger trait (F=136.81), and anger expression scores (F=151.95) (P<0.001). Eta-squared values indicate that 80.4%, 60.6%, 72.8%, and 69.6% of the variance in anger state, anger trait, and anger expression is attributable to the MBCR effects, respectively.

Discussion and conclusion

The findings of the study showed that MBCR affects reducing pain beliefs in women with rheumatoid arthritis. This result is in line with the research findings of Mobseri and Davoodi (2015), Paknahan and Safatinia (2023), Naghibi et al. (2019), and Pourrostami et al. (2023). People who have negative pain beliefs perceive problems negatively, and gradually the content of these thoughts and concepts becomes reality; therefore, they lose their awareness of time and are always in worry and stress. MBCR teaches people to accept their thoughts and feelings without judgment by teaching techniques such as non-judgment; this type of thinking prevents the creation of negative thoughts. Non-judgmental observation of stress-related thoughts may lead to the understanding that these are just thoughts that do not represent reality and should not necessarily cause escape or avoidance behavior (Kabat-Zinn, 2005). In this study, MBCR probably works by teaching mental representations of objects in life through breathing and thinking, it was possible to modify the beliefs related to pain in these

rheumatoid arthritis patients.

Another finding of the study was the effectiveness of MBCR on anger and its dimensions in women with rheumatoid arthritis. This result is in line with the findings of Zahedi Rad et al. (2024) and Paknohad and Shafarinia (2023). In explaining this finding, it can be said that MBCR, by increasing people's awareness of the present moment through techniques such as meditation, such as paying attention to the body's breathing, and focusing awareness on the here and now, led to body control and, consequently, mind control. This training was also effective in reducing negative moods such as stress, anxiety, and depression.

Accordingly, it can be stated that MBCR will be effective in preventing and improving the psychological consequences of the disease and improving the quality of life of patients. The lack of follow-up, the use of appropriate sampling, and the lack of control over background and individual factors (personality characteristics, economic, social, and family status) were limitations of the study. It is suggested that MBCR be used as an educational and therapeutic package in addition to the physician's treatment protocol for these patients.

Introduction

Patients with chronic pain experience many psychological problems (Bennett et al., 1996). Rheumatoid arthritis is one of the chronic pain diseases that is accompanied by joint inflammation, erosive pain, dryness, and swelling in the joints. This chronic inflammatory disease is characterized by swelling, tenderness, and joint destruction. In this autoimmune disease, the body's defense system attacks the cellular components of healthy tissues and produces antibodies, causing swelling, fatigue, movement restriction, deformity, joint destruction, and pain (Arnett et al., 1988). The global prevalence of rheumatoid arthritis has been reported to be 4% (Almutairi et al., 2021) and is more prevalent in women (Chancay et al., 2019). In Iran, the prevalence of rheumatoid arthritis in women has been reported to be 6 times higher (Jamshidh et al., 2019). Psychological distress among rheumatoid arthritis patients is twice that of the general population (Ang et al., 2005). Research evidence suggests the existence of sexual and psychological problems among patients with rheumatoid arthritis (Moller et al., 2020). Research evidence shows that pain is associated with emotional stress, limitations in emotional awareness, and expression of emotions (Lumley et al., 2011). Pain is also present in patients with chronic pain, including rheumatoid arthritis, migraine, lupus, low back pain, and fibromyalgia (Lumley et al., 2002; Lumley et al., 2005). Research results have also shown that anxiety may reduce the pain threshold and intensify the experience of pain (Madioni & Mammana, 2001; Mattila et al., 2008; Rezaei et al., 2013).

One of the variables that affect the severity of patients' pain is anger. Anger causes the person to be cognitively affected and react aggressively. Anger has been widely observed among people with chronic diseases such as rheumatoid arthritis. A study showed that anger plays an essential role among women and men with chronic pain. Also, women express anger outwardly, and men suppress anger (Fernandez and Turk, 1995). A study by Okifuji et al. (1999) concluded that anger was a common emotional experience among patients with chronic pain. Research showed that anger rumination was associated with cognitive helplessness, intense activity of the sympathetic system, and the experience of intense anger has a strong relationship (Takebe et al., 2017). People with intolerance of uncertainty are more vulnerable to rumination (Huntley et al., 2022). Kamali et al. (2024) found that metacognitive beliefs, intolerance of uncertainty, and anger rumination have a direct effect on perceived pain intensity.

For patients with rheumatoid arthritis, pain is the most important problem and their priority for visiting medical centers (Taylor et al., 2010). Pain severely affects the perceived mental health of these patients and is considered the most essential variable affecting their quality of life (Diethelm& Schuler, 1991). A

study by Studenic et al. (2012) on rheumatoid arthritis has shown that pain is the most important independent determinant of the patient's perception of their disease activity. However, the physician or assessor often pays attention to joint inflammation. In a study, significant relationships were found between functional disability, joint tenderness, pain, emotional support, and psychological distress in rheumatoid arthritis patients (Benka et al., 2012), and rheumatoid arthritis patients who had greater flexibility had better mental, social, and physical health (Russell et al., 2019).

Mindfulness-based training has found its place as a complementary therapy alongside other physical and psychological therapies (Kostova et al., 2019). Studies have shown that mindfulness, as a cognitive and dynamic construct, can modulate people's responses to stressful and emotional situations by identifying habitual and involuntary rumination patterns and transforming them into conscious and controllable patterns (Rupprecht & Walach, 2016). In this way, the individual learns to recognize negative emotions and thoughts and change them into simple, controllable events (Li et al., 2017). Mindfulness is a form of meditation and receptive, non-judgmental awareness of current events and emerges through purposeful attention, here and now, and non-judgmental attention to moment-to-moment experiences. This technique uses the client's cognitive restructuring ability and teaches people to accept that thoughts and feelings exist rather than forcefully controlling or suppressing their negative thoughts. A review study reported that mindfulness produces various positive psychological effects, including increased psychological well-being, reduced psychological symptoms and emotional reactivity, improved emotion and behavior regulation, and increased vitality (Ottu et al., 2019).

Mindfulness-based cognitive therapy is effective in improving pain beliefs (Mobseri & Davoodi, 2015), and psychological symptoms (Oliyani et al., 2022). Mindfulness-based therapy has been shown to reduce depression and aggression (Zahedi Rad et al., 2021), reduce stress, and increase quality of life and self-interest (Katyal, 2012). Research evidence also indicates the effectiveness of acceptance and commitment therapy in reducing emotion-focused and avoidant coping styles, and increasing sexual function, problem-focused coping style, and distress tolerance (Bagheri et al., 2023). Cognitive therapy based on mindfulness has been shown to reduce psychological symptoms and pain intensity in patients with specific diseases (Naghibi et al., 2020), increase the quality of life and self-efficacy, and increase coping strategies (Daneshnia et al., 2021), increase self-efficacy and perception of pain and reduction of negative mood and perceived stress (Paknhad and Shafari, 2023), and improvement of self-efficacy, emotion regulation, and pain perception (Pourrostami et al., 2023) have been effective in patients with arthritis.

Given the high prevalence of rheumatoid arthritis and its psychological consequences, the limited research interventions in this field, the role of psychological variables in the prognosis and exacerbation of disease symptoms, and the introduction of psychological educational methods to improve the quality of life of these patients alongside drug therapy, this study is deemed necessary. Therefore, the study was conducted to determine the effect of mindfulness-based stress reduction therapy on pain beliefs related to pain and anger in women with rheumatoid arthritis.

Method

Participants

This semi-experimental study was a pre-test and post-test design with a control group. The statistical population of the study included all female volunteers with rheumatoid arthritis in Tabriz in 2022, with the high prevalence of this disease in women being the reason for selection. The study sample consisted of 25 women selected through convenience sampling, with 12 individuals randomly assigned to the experimental

group and 13 to the control group. Inclusion criteria were: willingness to participate in the study, female gender, age between 30 and 60 years, education of at least one cycle, and duration of illness of at least one year. Exclusion criteria included a history of hospitalization in a psychiatric ward, use of psychiatric medications, and failure to complete the questionnaires.

Ethical Statement

Ethical considerations were fully observed in all stages of the research. At the beginning of the work, the necessary and sufficient information about the purpose of the study, the method of training, and evaluations were explained to the participants. All subjects participated in the research voluntarily and without any pressure or coercion. All the information obtained from the women was analyzed confidentially. This research has been approved as a Master›s thesis in Psychology at Islamic Azad University, Ardabil Branch.

Measurements

To collect data, the following questionnaires were used:

Pain Beliefs and Perception Inventory (PBPI): This questionnaire was developed by Williams and Thorne (1989) to measure beliefs related to chronic non-cancer pain. The questionnaire consists of 15 items that are answered on a 4-point Likert scale (strongly agree, agree, disagree, and strongly disagree). The minimum and maximum scores of this questionnaire are 15 and 60. It measures three factors: pain mystery, self-blame, and time. Asghari Moghadam (2011) reported in a study that the internal consistency coefficients of the pain mystery, time, and blame subscales were 0.80, 0.80, and 0.65, respectively. The Cronbach's alpha coefficient was 0.89, and the test-retest coefficient was 0.71. The convergent validity of this questionnaire was confirmed through correlation with the pain self-efficacy scale, and the divergent validity was confirmed through correlation with the physical disability, depression, anxiety, pain intensity, and catastrophizing scales. In the present study, the Cronbach's alpha of the questionnaire was 0.83.

State-Trait Anger Expression Inventory (StAXI): This questionnaire was developed by Spielberger (1988) and consists of 44 items. It was validated in a non-clinical population by Asghari Moghadam and Julaieha (2008). The questionnaire has 32 items answered on a 4-point scale (rarely to always). The minimum and maximum scores of this questionnaire are 0 to 96. The correlation coefficients of the trait anger scale with three measures of hostility were calculated, and these coefficients varied from 0.32 to 0.71 for men and from 0.31 to 0.66 for soldiers (P=0.001). In the study by Asghari Moghadam et al. (2011), the Cronbach's alpha coefficient of this questionnaire in clinical and non-clinical groups was 0.76 and 0.81, respectively, and the test-retest reliability coefficients were reported to be 0.65 and 0.84 in these groups, respectively. In the present study, the Cronbach's alpha of the questionnaire was 0.79.

Procedure

After obtaining the necessary permits, the researcher referred to hospitals and specialized clinics in Tabriz in 1401 and invited female volunteer patients with rheumatoid arthritis to participate in a briefing session by phone call. In this session, the researcher explained the disease of rheumatoid arthritis, the general design of the study, its goals and duration, the confidentiality of personal information, the right to withdraw from the study at any time, and the time and place of the meetings. Ethical considerations included obtaining written consent to participate, fully explaining the study objectives, ensuring confidentiality of personal information, and covering travel expenses for participants. Twenty-five eligible and willing participants were randomly assigned to the control (12 people) and experimental (13 people) groups. Both

groups completed the research questionnaires as a pre-test. The experimental group received mindfulness-based stress reduction training in 8 90-minute sessions over 4 weeks (two sessions per week) in a group setting following health protocols in the hospital conference hall facilitated by a specialist. The control group remained on the waiting list without receiving any training. After the training sessions, both groups completed a post-test. Following the post-test, the control group received the necessary psychological services. Finally, data analysis was performed using multivariate analysis of covariance with SPSS-20 statistical software.

Description of the MBCR

In this study, the MBCR (Kabat-Zinn, 2005) was implemented in the experimental group once a week for eight 90-minute sessions. The MBCR protocol was used as a group intervention (Table 1).

Results

The descriptive findings indicated that the mean (standard deviation) of age for the experimental and control groups were 39.08 (2.99) years and 38.84± (2.37) years, respectively. The level of education was as follows: diploma/bachelor's degree (25% and 15.4%), master's degree (33.3% and 30.8%), and bachelor's degree (53.8% and 41.7%). Table 2 shows the mean and standard deviation of the pretest, posttest, and follow-up scores for pain beliefs and

Table 1: Summary of mindfulness-based stress reduction training sessions

Session	Content
First	Introducing the trainer, getting to know the group members, and establishing a training relationship. Introducing mindfulness-based stress training, its goals, and main themes. Explaining the rules governing training sessions. Providing information about pain and anger and their types. Reviewing training related to pain and anger, their costs, and benefits. Resting and receiving food. Getting acquainted with the main concepts and topics of the training sessions.
Second	Reviewing the experiences of the previous session and receiving feedback from clients. Discussing and evaluating their experiences. Creating attention and awareness through relaxing the mind and body (body scan) for group members.
Third	Reviewing the experiences of the previous session and receiving feedback from the trainees. Creating attention and awareness through focusing on breathing (sitting meditation). Summarizing the discussions raised in the session and reviewing the practice for the next session..
Fourth	Reviewing the experiences of the previous session and receiving feedback from the trainees. Awareness of the connection between the automatic mind and being mindful. Awareness of the body in the present moment to reduce stress. Summarizing the discussions raised in the session and reviewing the practice for the next session.
Fifth	Reviewing the experiences of the previous session and receiving feedback from the trainees. Familiarization with negative thoughts and their effect on creating and limiting one's experience. Allowing one to attend the experience without judgment and without change.
Sixth	Reviewing the experiences of the previous session and receiving feedback from the trainees, becoming familiar with negative thoughts and their impact on creativity, and creating limits for the individual's experience. Allowing the participant to attend the experience without judgment and change, summarizing the discussions raised in the session, and reviewing the practice for the next session.
Seventh	Reviewing previous session experiences and receiving feedback from trainees, regulating attention, defocusing, and metacognitive development through mindfulness.
Eights	Summarizing the presented material and concluding it. Awareness of the effects of mindfulness-based stress reduction. At the end of each session, the group was given homework to learn the material. At the beginning of each session, homework was reviewed, and feedback was given.

the dimensions of anger in the experimental and control groups.

The Shapiro-Wilk test shows that the significance level is higher than 0.05, confirming the normal distribution of the pain beliefs and anger scores (P > 0.05). Box's test showed that the covariance of the variables was equal in both groups, which confirms the assumption of the variance-covariance in pain beliefs (Box's M=14.828, F=1.53, P=0.28) and dimensions of anger scores (P > 0.05). Levene's test showed that the variances of the variables were equal in both groups, confirming the assumption of equality of variance (P > 0.05). To check the homogeneity of the regression slope, the interaction effect of the covariate variables of pain beliefs and dimensions of anger scores and group is not significant, which confirms the assumption of non-significance of the interaction effect between the covariate and independent variables (P > 0.05). Since the assumptions of analysis of covariance have been confirmed in this study, the analysis of covariance test was used.

The results of the multivariate analysis of covariance are presented in Table 3.

In Table 3, the multivariate analysis of covariance shows a significant difference between groups in the persistence of pain (F=57.04, η2=0.763), blame (F=123.8, η2=0.718), consistency of pain (F=43.24, η2=0.747), and mastery scores (F=19.11, η2=0.696) (P<0.001). Specifically, MBCR demonstrated a significant effect on pain beliefs. Eta-squared values indicate that 76.3%, 71.8%, 74.4%, and 69.6% of the variance in the persistence of pain, blame, consistency of pain, and mastery are attributable to the MBCR

Table 2. Mean and standard deviation of resilience, rumination, and dysfunctional attitudes of study groups in pre-test and post-test.

Variable	Time	Experimental group		Control group	
pain beliefs		M	SD	M	SD
Belief in the persistence of pain	Pre-test	9.08	1.37	8.92	1.25
	Post-test	7.41	1.37	8.92	0.95
Belief in self-blame	Pre-test	7.50	0.99	7.53	0.96
	Post-test	4.91	0.51	7.15	0.80
Believe in persistence of pain	Pre-test	7.33	0.65	7.46	0.96
	Post-test	6.04	0.60	7.61	0.76
Belief in the mystery	Pre-test	6.6	1.19	6.76	1.01
	Post-test	5.02	0.60	6.61	1.12
Total	Pre-test	30.08	2.50	30.69	1.93
	Post-test	23.33	1.55	30.30	1.31
Dimensions of Anger					
Anger state	Pre-test	36.41	2.90	36.84	3.15
	Post-test	31.91	1.83	36.15	3.18
Anger trait	Pre-test	25.50	2.23	26.92	1.49
	Post-test	21.41	1.56	26.23	1.42
Expression and control	Pre-test	72.83	3.12	71.92	3.06
	Post-test	67.08	2.81	71.38	27.78
Total	Pre-test	134.75	3.57	135.69	5.43
	Post-test	120.41	3.02	133.76	5.21

Table 3: Results of multivariate covariance analysis for measuring the effectiveness of the intervention on the pain beliefs and the dimensions of anger

Variable		F	*P*	Eta^2	OP
pain belief	Persistence of pain	57.04	0.001	0.763	1
	Blame	123.8	0.001	0.718	1
	Consistency of pain	43.24	0.001	0.747	1
	Mystery	19.11	0.001	0.696	1
imensions of anger	Anger state	74.17	0.001	0.804	1
	Anger trait	136.81	0.001	0.606	1
	Anger expression	151.95	0.001	0.728	1

effects, respectively.

Additionally, the results indicated a significant difference between groups in anger state (F=74.17, η2=0.804), anger trait (F=136.81, η2=0.606), and anger expression scores (F=151.95, η2=0.729) (P<0.001). Namely, MBCR demonstrated a significant effect on dimensions of anger. Eta-squared values indicate that 80.4%, 60.6%, 72.8%, and 69.6% of the variance in anger state, anger trait, and anger expression are attributable to the MBCR effects, respectively.

Discussion and Conclusion

The present study aimed to investigate the effectiveness of mindfulness-based stress reduction training on pain beliefs and anger in women with rheumatoid arthritis. The findings showed that MBCR affects reducing pain beliefs in women with rheumatoid arthritis. This result is in line with the research findings of Mobseri and Davoodi (2015), Paknahan and Safatinia (2023), Naghibi et al. (2019), and Pourrostami et al. (2023). These studies have shown the effect of mindfulness training on reducing psychological symptoms and pain intensity and increasing the quality of life and self-efficacy of patients with rheumatoid arthritis.

People with negative pain beliefs perceive problems negatively, and the content of these thoughts and concepts changes to reality; therefore, they lose their awareness of time and are constantly worried and stressed. MBCR teaches people to accept their thoughts and feelings without judgment by teaching techniques such as non-judgment; this type of thinking prevents the creation of negative thoughts. Non-judgmental observation of stress-related thoughts may lead to the understanding that these are just thoughts that do not represent reality and should not necessarily cause escape or avoidance behavior (Kabat-Zinn, 2005). In this study, MBCR probably works by teaching mental representations of objects in life through breathing and thinking; it was possible to modify the beliefs related to pain in these rheumatoid arthritis patients. MBCR not only reduces the harmful consequences of stressful situations by facilitating positive process evaluation in the patient but also by breaking the habit of using negative and passive coping strategies. It was able to reduce the patient's stress and, as a result, improve negative beliefs related to pain. This training, through the integration of life and a clear vision of experiences, probably leads to positive changes in the thoughts and patients well-being (Smith et al., 2008). Through MBCR, rheumatoid arthritis patients learned to temporarily release their attitudes and beliefs rooted in the past and influenced by fears and worries about the future through techniques related to experiencing the present moment. Also, through this treatment, they developed an attitude of accepting all things (pleasant and unpleasant) without judgment. Adopting such a measure was beneficial for the affected person who experiences emotions and feelings such as

hopelessness, helplessness, and sadness, and as a result, their beliefs related to pain improved. Therefore, it is concluded that MBCR leads to a reduction in stress, negative beliefs related to pain, and a reduction in negative thoughts in patients with rheumatoid arthritis. MBCR, through the training of active coping strategies, helps patients re-evaluate the phenomenon of pain and anger experienced to a greater extent, and through the training of coping skills, they deal with planned problem-solving. These trainings were able to increase active confrontation, positive reappraisal, opposition to negative automatic thoughts, and, as a result, problem-solving led to a decrease in pain perception and an increase in effective anger management skills. On the other hand, self-control training led to increasing patients' control over pain. In these trainings, the individual controls the negative emotions and takes responsibility for their problems, and modifying or correcting them and positively reappraising their problems helps to control and improve coping styles.

Another finding of the study was the effectiveness of MBCR on anger and its dimensions in women with rheumatoid arthritis. This result is in line with the findings of Zahedi Rad et al. (2024), Daneshnia et al. (2021), and Paknohad and Shafarinia (2023). These studies have shown the effect of mindfulness training on psychological problems, aggression, and negative mood. In explaining this finding, we can say that MBCR increases people's awareness of the present moment through meditation, paying attention to the body's breathing by focusing awareness on the here and now, leading to body control and, consequently, mind control. This training was also effective in reducing negative moods such as stress, anxiety, and depression. However, judgment and prejudice in people with low mindfulness in many situations cause stress and unrest, increasing negative emotions such as stress and anger in women with rheumatoid arthritis. In mindful individuals, explicit and implicit emotional states are more congruent, and increased awareness of emotions enables patients to modulate their responses to negative stimuli (Ortner et al., 2007). Research evidence also suggests that mindful individuals experience lower levels of unpleasant emotions, both in intensity and frequency, and that participation in MBCR training sessions reduces these negative emotions (Arch & Craske, 2006). Mindfulness, by increasing the feeling of acceptance in patients, helps them accept their illness experience as it is and, despite the illness, continue to maintain their performance and efficiency in the best possible condition (Kabat-Zinn, 2011). We can explain that MBCR training through regular meditation exercises increased the patient's moment-to-moment awareness of feelings and emotions directed at their body; through this, patients learned to be aware and alert to their negative emotional thoughts, and to express these types of thoughts in a non-judgmental and calm manner. This method can also help patients create, maintain, and improve coping styles, reduce stress, and manage anger (Carlson et al., 2003). Through mindfulness, patients become aware of negative emotions and stress in their bodies and their causes and discover and isolate the confusing thoughts related to these feelings. The patient also learns how to cope with problems and manage their anger (Germer et al., 2005).

MBCR also increases self-efficacy in patients with rheumatoid arthritis and the ability to see their thoughts independently and impartially. However, this awareness is acquired through regular and repeated practice and increases self-efficacy, leading to better anger management. In this method, focusing on breathing can act as a fulcrum trained to return awareness to the present moment and reduce the content of deviation from reality through excessive mental preoccupation. These things cause patients to have more control over their thoughts and have greater self-efficacy and, as a result, better anger management (Stafford et al., 2015).

Overall, the results of this study showed that

mindfulness-based stress reduction training is effective in improving beliefs about pain and reducing anger in women with rheumatoid arthritis. Accordingly, it can be stated that MBCR will be effective in preventing and improving the psychological consequences of the disease and improving the quality of life of patients. The lack of follow-up, the use of appropriate sampling, and the lack of control over background and individual factors (personality characteristics, economic, social, and family status) were limitations of the study. It is suggested that MBCR be used as an educational and therapeutic package in addition to the physician's treatment protocol for these patients.

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