



Mindfulness-Based Cognitive Therapy, Cognitive Emotion Regulation and Clinical Symptoms in Females With Breast Cancer

Zahra Sadat Vaziri,¹ Ali Mashhadi,^{1,*} Zohreh Sepehri Shamloo,¹ and Soudabe Shahidsales²

¹Department of Psychology, Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, IR Iran

²Cancer Research Center, Omid Hospital, Mashhad University of Medical Sciences, Mashhad, IR Iran

*Corresponding author: Ali Mashhadi, PhD, Department of Psychology, Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, IR Iran. Tel: +98-5138803647, Fax: +98-5138803647, E-mail: mashhadi@um.ac.ir

Received 2015 September 24; Revised 2016 May 27; Accepted 2016 September 24.

Abstract

Background: Cancer is one of the most serious chronic diseases and risk factors for population health. Breast cancer is the most common cancer diagnosed in females. Today, some researchers in the field of clinical psychology by the implementation of psychosocial interventions sought to examine these effects on psychopathology in patients with breast cancer.

Objectives: The present study aimed to assess the efficacy of mindfulness-based cognitive therapy on the improvement of cognitive emotion regulation and decrease of clinical symptoms in females with breast cancer.

Methods: Sixteen females with breast cancer who referred to radiation oncology centers of Mashhad, Iran, were selected and randomly assigned (with Graph Pad software) into two groups of eight as intervention and control groups. The participants in the pretest, posttest and follow-up (four months) were examined by cognitive emotion regulation questionnaire (CERQ-P) and depression, anxiety and stress scale (DASS-21). Intervention group received eight sessions of two hours (one day per week) of mindfulness-based cognitive therapy and controls were placed on a waiting list. Data were analyzed by SPSS using multivariate analysis of covariance (MANCOVA).

Results: The intervention group showed a significant reduction in the rate of maladaptive cognitive emotion regulation strategies. But no significant differences were observed in the increase of adaptive cognitive emotion regulation strategies and decrease of clinical symptoms between the two intervention and control groups.

Conclusions: Mindfulness-based cognitive therapy may be effective to reduce maladaptive cognitive emotion regulation strategies.

Keywords: Mindfulness-Based Cognitive Therapy, Cognitive Emotion Regulation, Clinical Symptoms, Breast Cancer

1. Background

Breast cancer is uncontrolled growth of abnormal cells in different areas of the breast (1). According to the national cancer registration in Iran, over the past four decades, the increasing incidence of breast cancer placed it as the most common malignancy among Iranian females, which has affected them one decade earlier than their counterparts in the developed countries (2). Patients with breast cancer are 31 per 100,000 people (2). The diagnosis and treatment of cancer are considered to be emotionally disturbing or even traumatic. Therefore, it can have negative physical and psychological consequences. As an important role of the breast in female gender, reaction to this disease can include depression, anxiety and stress. The prevalence of depression, anxiety and stress is reported 14% to 38% during the course of the disease in 70% of patients with cancer (3). These reactions cause some problems such as dysfunction in performance, poor management in mak-

ing medical decisions, poor adherence to treatment regimens, poor social interactions and ultimately reduced quality of life of patients with breast cancer (4). The diagnosis of breast cancer is associated with high levels of stress for females (5). One of the factors that play an important role in coping with stressful life events and affects quality of life is emotion regulation (5, 6). Emotion regulation is a fundamental principle in the initiation, evaluation and organization of adaptive behavior, as well as prevention of negative emotions and maladaptive behaviors (7).

Different strategies are used in emotional regulation processes. Regulation of emotions through cognitions is one of the most common strategies. Cognitive emotion regulation is conceptualized as a process through which individuals modulate their emotions in response to environmental demands in the service of goals. Cognitive emotion strategies may help to manage or regulate emotions or feelings and keep control over the emotions and/not get overwhelmed by them during or after the experience of

threatening or stressful events (7).

The cognitive processing of an illness diagnosis plays a key role in adjustment with the focus on the role of cognitive content to determine psychological outcomes. Evidence from both cancer and chronic illness populations indicates that maladaptive cognitive responses increase vulnerability to depression and anxiety (8).

There is abundant evidence linking emotion regulation difficulties with psychopathology, and especially with internalizing disorders such as depression and anxiety. Several documents show that people who are not able to manage the emotional responses to the stressful events will experience longer and more difficult periods of depression and anxiety disorders (6, 9, 10). Cognitive emotion regulation strategies can be divided into two adaptive and maladaptive categories. Adaptive cognitive emotion regulation strategies include: positive refocusing, refocusing on planning, positive reappraisal and acceptance and putting into perspectives. Maladaptive cognitive emotion regulation strategies include self-blame, rumination, catastrophizing and blaming others (11).

Mindfulness-based therapies such as mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) are meditation-based emotion-regulation training programs that target emotional reactivity to stress in a wide range of clinical and non-clinical populations (11).

The results of many studies showed that MBCT was effective to treat many physical complaints such as chronic pain (12), health promotion in patients with cancer (13, 14) and fibromyalgia (15). Also, MBCT can reduce symptoms of physical body, emotions and experience avoidance (16).

MBCT is a new treatment from the third wave of cognitive-behavioral therapies applied to a large number of psychiatric disorders and chronic medical diseases such as cancer (17). MBCT is a combination of aspects of Beck cognitive therapy and mindfulness-based stress reduction program of Ockene et al. (18). Mindfulness is a present moment, purposeful and nonjudgmental form of directing attention (18). This type of cognitive therapy includes different meditations, introductory courses on depression, body scan and some cognitive therapy practices that reveal the relationship between mood, thoughts, feelings and body sensations (17).

This approach teaches people to change their relationship with their thoughts and negative emotions. Be aware of them and take a non-judgmental point of view toward them, instead of having a negative self-referential assessment that exacerbates their thoughts and negative emotions more (19).

Mindfulness practices result in improvements in emotion regulation. Mindfulness develops positive emotions

through emotion regulation and consequently, promotes mental health (6). Therefore, positive emotions lead to faster recoveries of negative emotional states and prevent long-term physical complications (19). The increasing evidence proposes that mindfulness trait is associated with less use of maladaptive emotion regulation strategies and reduced physiological emotional responding in the presence of stress (6).

As a result, MBCT is expected to help patients effectively regulate their emotions, in response to stressors (20-22).

Receiving cancer diagnosis, as a stressful event, causes emotional problems such as depression, anxiety and stress in females with breast cancer. On the other hand, no follow-up and treatment of depression, anxiety and stress leads to poor adherence to doctor's orders, less pain control, low quality of life and less likely to survival. Therefore, the current study aimed to examine the effect of mindfulness-based cognitive therapy on improvement of cognitive emotion regulation and clinical symptoms in females with breast cancer.

2. Objectives

The purpose of this study was to evaluate the efficacy of mindfulness-based cognitive therapy on the improvement of cognitive emotion regulation and decrease of clinical symptoms in females with breast cancer.

3. Materials and Methods

3.1. Subjects

It was a quasi-experimental study with pre-test, post-test and follow-up (four months) design, conducted in Mashhad, Iran, during 2013 - 2014. The study population included all females with breast cancer referred to radiation oncology centers of Mashhad. The subject selection process was as follows: First, documents of 100 patients were investigated. Among them, just 37 patients had inclusion criteria and were selected, 20 patients declared their definite intention to participate in MBCT sessions. They were randomly assigned, by Graph Pad Software, into two groups of 10 as intervention and control groups; two patients could not complete MBCT sessions (because of cancer recurrence and its therapeutic follow-up). Therefore, they were excluded from the study and only eight patients' data were analyzed in the posttest stage.

In order to maintain consistency, two patients of control group (wait list) were randomly deleted from the study. And only eight patients were analyzed in the posttest stage. After four months in the follow-up stage,

the data of 16 patients (eight in the intervention group and eight in the control group) were re-analyzed.

As mentioned above, 16 patients with breast cancer were selected and randomly assigned. Study inclusion criteria required participants with non-metastatic breast cancer, aged 18 to 65 years, no history of psychiatric disorders, no history of sedatives, anti-anxiety and anti-depressant drugs use. Participants were excluded if they had metastatic breast cancer or a history of mental disorders.

3.2. Procedure

The process of the study was divided into several stages:

First stage, collecting samples and carrying out pre-tests: After willingness to engage, patients were asked to participate in a meeting entitled "Assessment and direction". Meeting "Assessment and direction" was a background to begin the treatment, which was held prior to the sessions to prepare patients for participation in the program. Following issues were discussed in this session: Informing participants of what the course gives them, what was required to attend the course, and also expectations of the participants of the course were proposed.

Second stage, intervention process: Intervention group received eight sessions of two hours (one day per week) of MBCT and controls were placed on a waiting list.

Third stage: carrying out the post-test.

Forth stage: the follow-up and data collection.

3.3. Measures

Depression, anxiety and stress scale (DASS-21): Patients' clinical symptoms were measured using depression, anxiety and stress scale. This is a self-report questionnaire that includes 21 items and three subscales. Each subscale consists of seven clauses. This scale is normalized among Iranian society. Internal consistency of depression-anxiety-stress scales was reported by Cronbach's alpha as follows: depression scale 0.77, anxiety scale 0.79 and stress scale 0.78. Regarding the validity, simultaneous implementation of Beck depression inventory, Zung anxiety and perceived stress questionnaires were used. The correlation of DASS depression scale with the Beck depression inventory was 0.70, the correlation between DASS anxiety scale with Zung anxiety was 0.67, and the correlation between perceived stress tests with DASS stress scale was 0.49. All correlations were significant at $P \leq 0.001$ (23).

3.4. Cognitive Emotion Regulation Questionnaire

This is a self-report questionnaire and consists of 36 items and nine subscales, including adaptive cognitive

emotion regulation strategies and maladaptive ones (mentioned above).

Score range is from 1 (almost never) to 5 (almost always). Each subscale consists of four clauses. Total score of each sub-scale is obtained by adding the clauses. The range of scores for each subscale is between 4 and 20.

In a study, the coefficient's validity (internal consistency coefficients) of questionnaire was estimated from 0.76 to 0.92 (24), which showed that the scale validation was acceptable.

Data were analyzed by SPSS ver. 19 using multivariate analysis of covariance (MANCOVA).

4. Results

The study data were collected at three times (pretest, posttest, follow-up: four months) measuring the process of change in emotion regulation strategies and clinical symptoms.

Mean scores of subscales including adaptive cognitive emotion regulation strategies (Table 1), maladaptive cognitive emotion regulation strategies (Table 2) and clinical symptoms (Table 3) all from pretest stage are reported below.

Table 1. Mean Scores of Adaptive Cognitive Emotion Regulation Strategies in the Pretest^a

Groups/Subscales	Experimental	Control
Acceptance	13.87 (3.09)	13.50 (1.77)
Positive refocusing	12.87 (3.13)	10.75 (3.80)
Refocus on planning	14.12 (3.87)	13.50 (4.37)
Positive reappraisal	14.87 (4.01)	11.75 (5.33)
Putting on perspective	14.62 (3.02)	12.62 (3.62)

^aValues are expressed as mean (SD).

Table 2. Mean Scores of Maladaptive Cognitive Emotion Regulation Strategies in the Pretest^a

Groups/Subscales	Experimental	Control
Self-blame	8.50 (2.00)	7.62 (1.99)
Rumination	15.00 (3.16)	14.62 (4.83)
Catastrophizing	10.37 (4.03)	12.87 (4.91)
Other-blame	9.12 (4.01)	10.87 (5.54)

^aValues are expressed as mean (SD).

For all hypotheses MANCOVA was used. The results are presented in the following

Table 3. Mean Scores of Clinical Symptoms in the Pretest^a

Groups/Subscales	Experimental	Control
Depression	14.50 (6.98)	16 (11.21)
Anxiety	9.50 (5.42)	16.25 (10.05)
Stress	18 (9)	18.50 (9.66)

^aValues are expressed as mean (SD).

It was hypothesized that MBCT significantly increases adaptive strategies in females with breast cancer in the posttest and follow-up stages. Results showed no significant differences in the post-test and follow-up scores in any of the adaptive strategies subscales (Table 4).

It was also hypothesized that MBCT significantly decreases maladaptive strategies in females with breast cancer in the post test stage. Results showed no significant differences in the posttest scores in any of the maladaptive strategies subscales but significant differences were observed in rumination and catastrophizing subscales in the follow-up stage (Table 5).

According to Table 6, there were no significant differences in the posttest and follow-up scores in any of the clinical symptoms of subscales.

5. Discussion

The current study aimed to assess the effectiveness of mindfulness-based cognitive therapy (MBCT) on improvement of cognitive emotion regulation and decrease of clinical symptoms in females with breast cancer. The data analysis showed no significant effect of MBCT on adaptive strategies in the posttest or follow-up stages. It is noteworthy to mention some points.

Cancer is a multiple disease which affects different aspects of patient's life; for example, physical, psychological, social, vocational and financial aspects. Furthermore, since cancer is a chronic disease that requires medical follow-ups and monthly check-ups even after improvement, prolonged exposure to this disease and focus on it makes participants absorbed by such problems, which reduce their ability to live in the present moment. It is possible that they need a problem-solving 'doing' mode, which is different from the more accepting 'being' mode, which is at the core of MBCT. As being in the present moment is a prerequisite to practice mindfulness exercises, this barrier strongly reduced the possibility to change.

Another barrier was that some patients with a relatively low readiness for change needed individual support to increase their willingness to experience acceptance or more sessions to support their process of change, before

they were ready to fully benefit from MBCT. Due to these reasons, participants were not able to engage in exercises effectively. Therefore, no changes were observed in adaptive strategies. Similarly, a recent trial using MBCT to treat patients with medically unexplained symptoms did not find the intervention associated with improvement in general health status (25).

Also, in the current study the obtained results indicated that MBCT did not decrease maladaptive strategies in posttest stage, but they significantly decreased in the follow-up stage.

One of the important functions of mindfulness exercises is to avoid initiating a cycle of rumination. Moreover, mindfulness exercises require practice, repetition and time to reveal its effectiveness. Therefore, it should be considered that the interval between post-test and follow-up helped subjects to increase their skills to use mindfulness exercises over time. And they could reduce maladaptive strategies in the follow-up stage. Similarly, a study conducted on multiple chemical sensitivity (MCS) showed that MBCT did not improve the overall illness status in individuals with MCS, but MBCT positively changed cognitive and emotional representations of MCS (26). A large randomized controlled trial on fibromyalgia, did not find an MBSR-based program superior to even a wait-list control (15).

With regard to clinical symptoms (depression, anxiety and stress) the current study results showed no statistically significant reductions in the level of depression, anxiety and stress after treatment by MBCT. The negative results corresponded well with other recent studies assessing the effects of mindfulness-based interventions on various chronic medical diseases; for example, a recently conducted study with patients diagnosed with somatoform disorder compared mindfulness therapy with enhanced treatment as usual (TAU), did not find a difference between mindfulness group and enhanced TAU group on a measure of health-related quality of life at 15-months follow-up (27). Also, results of another study on the effects of MBSR on mental health of adults with a chronic medical disease revealed that MBSR had little effects on depression, anxiety and psychological distress in people with chronic physical diseases (28).

5.1. Conclusion

In conclusion, the present study indicated that mindfulness-based cognitive therapy may be effective to reduce maladaptive strategies. Integrating mindfulness-based interventions are an important milestone in the palliative care of patients with breast cancer.

Table 4. Results of Analysis of Covariance on Mean Scores of Adaptive Strategies in the Posttest and Follow-up Stages

Dependent Variable	DF	Posttest				Follow-Up			
		Mean Square	F	P Value	Eta Squared	Mean Square	F	P Value	Eta Squared
Acceptance	1	0.35	0.03	0.85	0.004	1.47	0.12	0.73	0.01
Positive refocusing	1	2.04	0.39	0.54	0.03	9.73	2.11	0.17	0.17
Refocus on planning	1	0.31	0.05	0.81	0.006	1.60	0.19	0.67	0.01
positive reappraisal	1	4.70	0.96	0.35	0.08	8.86	1.64	0.22	0.14
Putting on perspective	1	0.04	0.006	0.94	0.001	2.15	0.28	0.60	0.03

Table 5. Results of Analysis of Covariance on Mean Scores of Maladaptive Strategies in the Posttest and Follow-up Stages

Dependent Variable	DF	Posttest				Follow-Up			
		Mean Square	F	P Value	Eta Squared	Mean Square	F	P Value	Eta Squared
Self-blame	1	0.51	0.11	0.73	0.01	0.13	0.04	0.83	0.004
Rumination	1	54.58	7.51	0.02	0.42	94.58	25.84	0.001	0.72
Catastrophizing	1	11.07	1.64	0.22	0.14	44.11	17.67	0.002	0.63
Other-blame	1	33.57	6.30	0.03	0.38	35.97	5.24	0.04	0.34

Table 6. Results of Analysis of Covariance on Mean Scores of Clinical Symptoms in the Posttest and Follow-up Stages

Dependent Variable	DF	Posttest				Follow-Up			
		Mean Square	F	P value	Eta Squared	Mean Square	F	P-value	Eta Squared
Depression	1	33.06	0.50	0.49	0.04	46.82	1.49	0.24	0.11
Anxiety	1	13.99	0.20	0.65	0.01	4.98	0.14	0.71	0.01
Stress	1	10.70	0.91	0.36	0.07	0.04	0.002	0.96	0.0001

Acknowledgments

The authors would like to thank all the participants for their cooperation.

Footnotes

Authors' Contribution: Zahra Sadat Vaziri and Ali Mashhadi conceived and designed the evaluation. Soudabe Shahid-sales collected the clinical data. Zohreh Sepehri Shamloo interpreted the clinical data. Zahra Sadat Vaziri performed the statistical analysis and drafted the manuscript. All authors read and approve the final manuscript.

Declaration of Interests: There was no conflict of interest regarding the material and results of the current study.

Funding/Support: There was no financial support for the current study.

References

1. *Breast cancer facts figures 2007-2008*. Atlanta: American Cancer Society; 2012. American Cancer Society.
2. Monfared A, Pakseresht S, Ghanbari A, Atrkarroshan Z. Life quality related to health and effective factors on it in women with breast cancer. *Holistic Nurs Midwifery*. 2013;7:52-6.
3. Aghabarari M, Aghaalienejad H, Mohammadi A, Hajizade A. *The effectiveness of sport program designed for stress, anxiety and depression in breast cancer women undergone chemotherapy*. [MA thesis]. Shahrekord University of Medical Sciences; 2007. (Persian).
4. Kesler S, Hadi Hosseini SM, Heckler C, Janelins M, Palesh O, Mustian K, et al. Cognitive training for improving executive function in chemotherapy-treated breast cancer survivors. *Clin Breast Cancer*. 2013;13(4):299-306. doi: [10.1016/j.clbc.2013.02.004](https://doi.org/10.1016/j.clbc.2013.02.004). [PubMed: 23647804].
5. Garnefski N, Van Den Kommer T, Kraaij V, Teerds J, Legerstee J, Onstein E. The relationship between cognitive emotion regulation strategies and emotional problems: comparison between a clinical and a non-clinical sample. *Eur J Pers*. 2002;16(5):403-20. doi: [10.1002/per.458](https://doi.org/10.1002/per.458).
6. Desrosiers A, Vine V, Klemanski DH, Nolen-Hoeksema S. Mindfulness and emotion regulation in depression and anxiety: common and distinct mechanisms of action. *Depress Anxiety*. 2013;30(7):654-61. doi: [10.1002/da.22124](https://doi.org/10.1002/da.22124). [PubMed: 23592556].
7. Garnefski N, Kraaij V, Spinhoven P. Negative life events, cognitive emotion regulation and emotional problems. *Pers Individ Differ*. 2001;30(8):1311-27. doi: [10.1016/S0191-8869\(00\)00113-6](https://doi.org/10.1016/S0191-8869(00)00113-6).
8. Soo H, Sherman KA. Rumination, psychological distress and post-traumatic growth in women diagnosed with breast cancer. *Psychooncology*. 2015;24(1):70-9. doi: [10.1002/pon.3596](https://doi.org/10.1002/pon.3596). [PubMed: 24962968].
9. Wang Y, Yi J, He J, Chen G, Li L, Yang Y, et al. Cognitive emotion regulation strategies as predictors of depressive symptoms in women newly diagnosed with breast cancer. *Psychooncology*. 2014;23(1):93-9. doi: [10.1002/pon.3376](https://doi.org/10.1002/pon.3376). [PubMed: 24038706].
10. Gross JJ, John OP. Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *J Pers Soc Psychol*. 2003;85(2):348-62. [PubMed: 12916575].

11. Britton WB, Shahar B, Szepsenwol O, Jacobs WJ. Mindfulness-based cognitive therapy improves emotional reactivity to social stress: results from a randomized controlled trial. *Behav Ther.* 2012;**43**(2):365–80. doi: [10.1016/j.beth.2011.08.006](https://doi.org/10.1016/j.beth.2011.08.006). [PubMed: [22440072](https://pubmed.ncbi.nlm.nih.gov/22440072/)].
12. Davidson RJ, Kabat-Zinn J, Schumacher J, Rosenkranz M, Muller D, Santorelli SF, et al. Alterations in brain and immune function produced by mindfulness meditation. *Psychosom Med.* 2003;**65**(4):564–70. [PubMed: [12883106](https://pubmed.ncbi.nlm.nih.gov/12883106/)].
13. Specia M, Carlson LE, Goodey E, Angen M. A randomized, wait-list controlled clinical trial: the effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosom Med.* 2000;**62**(5):613–22. [PubMed: [11020090](https://pubmed.ncbi.nlm.nih.gov/11020090/)].
14. Tacon AM, Caldera YM, Ronaghan C. Mindfulness-Based Stress Reduction in women with breast cancer. *Fam Systems Health.* 2004;**22**(2):193–203. doi: [10.1037/1091-7527.22.2.193](https://doi.org/10.1037/1091-7527.22.2.193).
15. Schmidt S, Grossman P, Schwarzer B, Jena S, Naumann J, Walach H. Treating fibromyalgia with mindfulness-based stress reduction: results from a 3-armed randomized controlled trial. *Pain.* 2011;**152**(2):361–9. doi: [10.1016/j.pain.2010.10.043](https://doi.org/10.1016/j.pain.2010.10.043). [PubMed: [21146930](https://pubmed.ncbi.nlm.nih.gov/21146930/)].
16. Zomorodi S, Rasoulzade Tabatabaee S, Arbabi M, Ebrahimi N, Azad Falah P. Comparison the effectiveness of cognitive-behavioral therapy and mindfulness-based cognitive therapy in decrease of symptoms in Irritable Bowl Syndrom patients. *Indig.* 2013;**18**(2):88–93. (Persian).
17. Mohammadkhani P, Khanipour H. *Mindfulness-based therapies*. Tehran: Publication of Social welfare and Rehabilitation sciences University; 2011. (Persian).
18. Ockene JK, Ockene IS, Kabat-Zinn J, Greene HL, Frid D. Teaching risk-factor counseling skills to medical students, house staff, and fellows. *Am J Prev Med.* 1990;**6**(2 Suppl):35–42. [PubMed: [2383411](https://pubmed.ncbi.nlm.nih.gov/2383411/)].
19. Hoffman CJ, Ersser SJ, Hopkinson JB. Mindfulness-based stress reduction in breast cancer: a qualitative analysis. *Complement Ther Clin Pract.* 2012;**18**(4):221–6. doi: [10.1016/j.ctcp.2012.06.008](https://doi.org/10.1016/j.ctcp.2012.06.008). [PubMed: [23059436](https://pubmed.ncbi.nlm.nih.gov/23059436/)].
20. Farb NA, Segal ZV, Mayberg H, Bean J, McKeon D, Fatima Z, et al. Attending to the present: mindfulness meditation reveals distinct neural modes of self-reference. *Soc Cogn Affect Neurosci.* 2007;**2**(4):313–22. doi: [10.1093/scan/nsm030](https://doi.org/10.1093/scan/nsm030). [PubMed: [18985137](https://pubmed.ncbi.nlm.nih.gov/18985137/)].
21. Grant JA, Courtemanche J, Rainville P. A non-elaborative mental stance and decoupling of executive and pain-related cortices predicts low pain sensitivity in Zen meditators. *Pain.* 2011;**152**(1):150–6. doi: [10.1016/j.pain.2010.10.006](https://doi.org/10.1016/j.pain.2010.10.006). [PubMed: [21055874](https://pubmed.ncbi.nlm.nih.gov/21055874/)].
22. Morgan D. Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse. *Psychother Res.* 2003;**13**(1):123–5. doi: [10.1080/713869628](https://doi.org/10.1080/713869628). [PubMed: [22475168](https://pubmed.ncbi.nlm.nih.gov/22475168/)].
23. Sahebi A, Asghari MJ, Salari RS. Validation of depression anxiety and stress scale (DASS-21) for an Iranian population. *Iran Psychol.* 2005;**4**(1):299–313. (Persian).
24. Hassani J. Parametric characteristics of cognitive emotion regulation questionnaire. *J Clin Psychol.* 2010;**3**:73–83. (Persian).
25. van Ravesteijn H, Lucassen P, Bor H, van Weel C, Speckens A. Mindfulness-based cognitive therapy for patients with medically unexplained symptoms: a randomized controlled trial. *Psychother Psychosom.* 2013;**82**(5):299–310. doi: [10.1159/000348588](https://doi.org/10.1159/000348588). [PubMed: [23942259](https://pubmed.ncbi.nlm.nih.gov/23942259/)].
26. Hauge CR, Rasmussen A, Piet J, Bonde JP, Jensen C, Sumbundu A, et al. Mindfulness-based cognitive therapy (MBCT) for multiple chemical sensitivity (MCS): Results from a randomized controlled trial with 1 year follow-up. *J Psychosom Res.* 2015;**79**(6):628–34. doi: [10.1016/j.jpsychores.2015.06.010](https://doi.org/10.1016/j.jpsychores.2015.06.010). [PubMed: [26311155](https://pubmed.ncbi.nlm.nih.gov/26311155/)].
27. Fjorback LO, Arendt M, Ornbol E, Walach H, Rehfeld E, Schroder A, et al. Mindfulness therapy for somatization disorder and functional somatic syndromes: randomized trial with one-year follow-up. *J Psychosom Res.* 2013;**74**(1):31–40. doi: [10.1016/j.jpsychores.2012.09.006](https://doi.org/10.1016/j.jpsychores.2012.09.006). [PubMed: [23272986](https://pubmed.ncbi.nlm.nih.gov/23272986/)].
28. Bohlmeijer E, Prenger R, Taal E, Cuijpers P. The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: A meta-analysis. *J Psychosom Res.* 2010;**68**:539–44. doi: [10.1016/j.jpsychores.2009.10.005](https://doi.org/10.1016/j.jpsychores.2009.10.005). [PubMed: [20488270](https://pubmed.ncbi.nlm.nih.gov/20488270/)].