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Effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on cognitive avoidance, rumination and emotional regulation in depressed individuals

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Abstract

Introduction: Regarding the prevalence of depression and the necessity of effective treatments, the present study aimed to investigate the effectiveness of cognitive therapy based on mindfulness on rumination, cognitive avoidance, and emotional regulation in depressed people.

Materials and Methods: The statistical population of this research consists of all the people who were referred to the psychology and counseling clinic of Mashhad University in 2021 and were diagnosed with depression through a clinical interview. The cases were selected using the convenient sampling method. They were randomly assigned into two mindfulness treatment and control groups. Research tools included Beck Depression Inventory-II (BDI-II), Ruminative Response Scale (RRS), Emotional Regulation Questionnaire (ERQ), Cognitive Avoidance Questionnaire (CAQ), and Structured Clinical Interviews for Mental Disorders (SCID-5CV). The data were analyzed by aiding descriptive statistics, the Kolmogorov-Smirnov test, and covariance analysis.

Results: The findings reveal a significant difference in the mean scores of rumination ($P< 0.001$), emotional regulation ($P< 0.001$), and cognitive avoidance ($P< 0.001$) between the experimental and control groups; this means that therapeutic intervention reduces the intensity of cognitive avoidance, emotionally dysregulation, and rumination in depressed people.

Conclusion: Based on the results, mindfulness-based cognitive therapy can be used to treat depression by reducing rumination and cognitive avoidance and improving emotional regulation.

Keywords: Cognitive avoidance, Depression, Emotional regulation, Mindfulness-based cognitive therapy, Rumination

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Introduction

Depression is one of the most prevalent psychiatric disorders and health problems worldwide. The World Health Organization (WHO) estimated that depression will be the most important debilitating disease in the world by 2030. The estimated lifetime prevalence of major depressive disorder ranges between 5 and 17%. As reported by the American Psychiatric Association, the one-year prevalence rate of major depressive disorder was nearly 7% in the United States (1).

The prevalence of depression in Iran is estimated to be 25%, and according to national studies of diseases and injuries, it is considered the third most important health problem in Iran (2). According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), depressive disorder is defined as one or more episodes of major depression without a history of mania, mixed, or hypomania episodes (3).

Recently, there has been an increasing focus on rumination as an important component of depression. Rumination is persistent and recurring thoughts centered on a common topic. These thoughts enter consciousness involuntarily and divert attention from desired topics (4). Furthermore, another core component of depressive symptoms is a problem with emotional regulation. Depressed patients mainly use maladaptive emotion regulation strategies and have difficulty using adaptive strategies (5). Some emotional problems, including emotional regulation, have been considered in recent studies. These conditions are assumed to play a significant role in depression disorder (6).

In recent years, many treatments have been used in the field of psychological problems, such as depression. Among these treatments, the effectiveness of cognitive-behavioral treatments has received special attention. Mindfulness-Based Cognitive Therapy (MBCT) is a cognitive therapy that is currently used as a targeted approach in treating patients with a history of depression.

This aims to "release the patient from the tendency to automatic reactions to thoughts, feelings, and events". The MBCT exercises focus on the connection between mood, thoughts, feelings, and bodily sensations (7,8). MBCT focuses on the present moment to process all aspects of mediating experience, including physiological and behavioral cognitive activities. Previous studies have shown the effectiveness of this treatment in improving depressive symptoms (9,10).

Despite the numerous treatment methods, we need more extensive studies in the field of investigating the effectiveness of existing treatment methods in disorders such as depression. Also, it is very important to examine the influencing and aggravating factors in a disorder such as depression to prevent its recurrence.

As mentioned, factors such as rumination, emotional dysregulation, and cognitive avoidance have been identified as key factors influencing the recurrence of depression and finding effective treatment methods. It is necessary to change these factors, which is the aim of the current research. According to the conducted research, less research, especially in Iran, has investigated the effectiveness of today's new treatments on these basic components of depression.

Materials and Methods

The statistical population of the research included all patients with symptoms of depression who were referred to Mashhad Academic Jahad Counseling Center between July and September 2021. The sample size for each of the subgroups, based on experimental and quasi-experimental research, is equal to 15 people in each group (11).

Thirty patients were selected based on the convenience sampling method. They were randomly divided into two equal experimental and control groups (n=15). The experimental group received mindfulness-based cognitive therapy, while the control group did not receive any treatment.

The inclusion criteria included 18 to 50 years old, diagnosed with depression disorder based on a structured clinical interview using SCID-5 and the Beck Depression Inventory, not receiving medication or psychological treatments, and lack of severe psychiatric disorder, and not having addiction. The exclusion criteria included absence of more than three sessions or unwillingness to participate at any stage.

Research instruments

A) Structured Clinical Interview for Mental Disorders (SCID-5): The Structured Clinical Interview diagnoses the main DSM-5. The SCID-5 is scored based on the absence/presence

of subthreshold symptoms (-), description of a dichotomous criterion that is false (no), and meeting the threshold for a symptomatic criterion (+). Most SCID questions can be answered as "yes" or "no". After the interview, the psychologist fills out a diagnostic scoring summary sheet that includes the DSM-5 diagnoses and the associated ICD-CM-10 diagnostic codes (12).

B) Beck Depression Inventory-II (BDI-II): This scale is the revised form of the Beck Depression Inventory, which was developed to measure the severity of depression. The questionnaire consists of 21 items. Based on the score, respondents are categorized into four groups: no or minimal depression (score of 0-13), mild depression (score of 14-19), moderate depression (score of 20-28), and severe depression (score of 29-63). In the Iranian population, the reliability of this scale was 0.91 using Cronbach's alpha method. Moreover, the validity of the questionnaire was reported to be acceptable using the factor analysis method (13).

C) Ruminative Response Scale (RRS): This scale has 22 questions with 4 Likert options. Based on this, a score between 22 and 44 indicates low rumination, a score between 44 and 66 indicates moderate rumination, and a score between 66 and 88 indicates high rumination (14). Cronbach's alpha coefficient of this scale is 0.90, and its retest validity is reported as 0.68 (15). This questionnaire has been translated into Persian by Bagherinejad, Salehi Faderdi, and Tabatabaei in Iran. They reported its correlation with depression and anxiety scores in a sample of Iranian students equal to 0.63 and its Cronbach's alpha coefficient as 0.88 (16).

D) Emotional Regulation Questionnaire (ERQ): This scale consists of 10 items divided into two subscales: cognitive reappraisal (6 items) and expressive suppression (4 items). The Cronbach's alpha coefficient for cognitive reappraisal and expressive suppression were

0.79 and 0.73, respectively. The test-retest reliability (3-month interval) for the total scale was 0.69 (17). The test-retest reliability of this scale in three months was 0.96. In Iran, Bigdeli et al. obtained Cronbach's alpha values of 0.83 for reappraisal and 0.79 for suppression (18).

E) Cognitive Avoidance Questionnaire (CAQ): This questionnaire contains 25 items that measure five cognitive avoidance strategies. The internal consistency of the total scale was 0.95, and the reliability was 0.85 based on the test-retest method (at intervals of 4 and 6 weeks) (19). The reliability coefficient of the Persian translated scale was determined by Cronbach's alpha for the total score of avoidance, withdrawal, substitution, distraction, avoidance of threatening stimuli, and image-to-thought transformation, which were 0.91, 0.91, 0.71, 0.89, and 0.90, respectively. Its validity was evaluated using the correlation coefficient with the White Bear Thought Suppression Index, which equals 0.48 (20).

Study procedure

First, a clinical interview was conducted for all patients referred to the center to assess their eligibility for inclusion. The interview included the BDI-II and SCID-5CV assessments at the time of referral. Next, 30 patients were randomly assigned to the experimental group (n= 15) or the control group (n= 15) using a random draw. Both groups completed the CAQ, ERQ, and RRS questionnaires at the pre-test. The patients in the experimental group received mindfulness-based cognitive therapy (Table 1) (21), while those in the control group did not receive any intervention.

After completing the treatment sessions, all participants filled out the questionnaires again in the post-test stage. It should be noted that the control group was offered free treatment after the study was completed to adhere to the ethical standards.

Table 1. The protocol for the mindfulness based cognitive therapy

	Mindfulness based cognitive therapy
Session 1	Automatic guidance Everyone experiences the effects of distraction at all times. They may read all the pages of a book but then find that they do not understand it. In such cases, they may or may not know what they focus on. In automatic guidance, the components of negative thinking with the possibility of control are considered. When the person realizes the automatic guidance, the mind is present. Content of the session. Home exercise: Focus on daily activities such as eating a meal, taking a shower, and so on

Session 2	Dealing with obstacles The objective of this session is to challenge people's obstacles. First, a physical examination exercise is performed so that the participants reach the presence of mind during the exercise, and then, they review what needs to be done with the help of the exercise. Physical examination meditation, ten minutes of mental presence on the flow of breathing. Home exercise: 45 minutes of meditation, 10 minutes of mindfulness, focusing on daily activity differently, and recording a daily report of a pleasant event
Session 3	Presence of mind on breath and body In this session, it becomes clear that the purpose of the trained exercises is not to find predetermined solutions to problems, and failure can occur even at this stage. There may be many grounds for such failures. The objective of the session: Awareness more than occupation and distraction of the mind. The individual is taught to focus more consciously and justly on breathing, to be more focused and integrated. Content of the session: Understanding the wandering mind, teaching the body inspection technique, controlling the wandering mind with physical examination, and reviewing negative spontaneous thoughts to be aware of the scattering and preoccupation of the mind. The practice of seeing and hearing for 5 minutes, reviewing assignments, and breathing with the presence of mind. Home exercise: Practicing yoga, a list of unpleasant events
Session 4	Staying on time People who have experienced negative emotions spend a lot of time and energy on comparisons. These people often suffer from feelings of loneliness, loss, hopelessness, and rejection and are easily saddened by unpleasant situations. There is an innate tendency to the past and regret in these people. While the mind presence approach does not control the mind and replaces positive mental images with negative ones from the past, present, or future, people are encouraged to let go of feelings of hopelessness and regret about the past. Home exercise: 3 minutes of breathing space three times a day, 3 minutes of breathing space as a coping strategy when experiencing unpleasant feelings
Session 5	Admission and permission of presence Session description: People who have experienced unpleasant feelings in the past often try hard to drive them away and avoid negative memories and emotions. Avoiding unpleasant events and trying to minimize discomfort requires much effort. Content of the session: Different communication means allowing the experience to be present exactly as it is without judging it or trying to change it from what it is. Home exercise: Sitting meditation, three minutes of regular breathing space (3 times a day), and three minutes of breathing space as a coping strategy (whenever you notice unpleasant feelings)
Session 6	Thoughts, not facts Session description: Unconscious people infer facts, perceive the senses differently, and are rarely aware of what they are doing as if the mind has an interpretation of all events. They quickly understand how these interpretations occur and create a series of emotional reactions that make them last. Content of the session: 40-minute sitting meditation, awareness of breathing and body, sounds, and thoughts, 3 minutes of breathing space. Home exercise: 4 minutes daily exercise and 3 minutes regular breathing space (3 times a day)
Session 7	How can I best take care of myself? Session description: Being receptive to thoughts, feelings, and body sensations during sessions is one of the most important issues. This acceptance helps people realize the critical moments in which they are immersed in thinking in an old and constructive way. In this therapy session, the person is instructed to find activities to help increase pleasant feelings. Finding activities should be based on the MBCT approach when inappropriate events and unpleasant feelings threaten the person. Home exercise: Selecting activities after the program, regular three-minute breathing (twice a day) and breathing as a coping strategy. Dealing with it with activities such as deep breathing, which made the person feel good in the past.
Session 8	Using what they have learned to deal with subsequent mood swings (irritability, deafness, and anxiety) Session description: This session begins with a physical examination exercise to provide a complete cycle. Participants are then allowed to recall their experiences from across the program and do an exercise in which they think about the past. Exercise and review of the whole program - What were the most valuable things you could do to help you achieve them in your life? and post-test implementation for the group

We analyzed the data through SPSS software, descriptive statistics, and inferential statistic tests (Kolmogorov/Smirnov test and covariance analysis).

Results

We studied 30 working married women with at least a bachelor's education in two experimental (15 people) and control (15 people) groups.

Table 2 presents descriptive indices of rumination, emotional regulation, and cognitive avoidance in two groups.

Table 2. Descriptive indices of rumination, emotional regulation, and cognitive avoidance

Variable	Time	Mindfulness therapy	Control
		Mean ± SD	Mean ± SD
Rumination	Pre-test	77.46 ± 4.73	74.00 ± 5.11
	Post-test	45.60 ± 3.33	76.46 ± 5.08
Emotion regulation	Pre-test	26.53 ± 3.33	29.80 ± 4.67
	Post-test	38.00 ± 4.89	28.86 ± 4.51
Cognitive avoidance	Pre-test	102.46 ± 3.20	101.06 ± 3.43
	Post-test	51.20 ± 4.58	101.60 ± 3.01

The presuppositions of the univariate analysis of the covariance test were checked for all variables. At first, the normality of the distribution of the variables was checked using the skewness and kurtosis values. For the pre-test and post-test scores of all three variables (rumination, emotional regulation, and cognitive avoidance), skewness and kurtosis values were in the range of -2 and -2. In addition, the results of the Kolmogorov/Smirnov test were also checked for the variables in pre-test and post-test stages, and the results of this test for all variables were insignificant ($P> 0.05$). Therefore, the above results showed the normality of the data related to pre-test and post-test scores for all variables. To check the homogeneity of the regression slope, the effect of the pre-test*group interaction on the post-test scores of that variable was investigated. These results showed that there was no interaction effect for any of the variables, namely, rumination (F=0.86, $P> 0.05$), emotional regulation (F= 0.59, $P> 0.05$), and cognitive avoidance (F= 2.27, $P> 0.05$).

Therefore, this pre-test and post-test regression slope was also the same in the groups. Also, we checked the homogeneity of variances of the dependent variables by Levene's F test. The results showed that the values of Levene's test for the post-test scores of rumination (1.37), emotional regulation (0.50), and cognitive avoidance (2.71) are not significant. Therefore, the variance of these variables was equal in the groups. So, all these presuppositions have been met.

We found a significant difference between the rumination of depressed people in the MBCT group and the control group. Table 3 shows the results related to univariate analysis of covariance. Regarding the results, the effect of pre-test scores was insignificant ($P> 0.05$, F= 4.03). Also, Table 3 show that after controlling the pre-test scores, the effect of therapeutic intervention on rumination scores in post-test stage was significant (F= 405.00, $P< 0.001$). In other words, there was a significant difference between the two groups in the mean scores of rumination in the post-test stage.

Table 3. Results of univariate covariance analysis comparing rumination in the groups

Source of changes	Sum of square	Degree of freedom	Mean Square	F	P	Effect size
Pre-test	67.18	1	67.18	4.03	0.055	0.13
Group	6752.35	1	6752.35	405.00	0.001	0.93
Error	450.15	27	16.67			
Total	7662.96	29				

Also, the adjusted means for the mindfulness treatment group and the control group in rumination were 45.05 and 77.01, respectively, and the above results indicated a significant difference between the two groups in the mean scores of the rumination in post-test. Moreover, this difference was in favor of mindfulness

treatment. Table 4 show that there was a significant difference between the emotional regulation of depressed people participating in the mindfulness treatment group and the control group. Also, Table 4 show that after controlling the pre-test scores, the effect of the intervention on the emotional regulation post-test scores was

significant (F= 137.11, $P < 0.001$). In other words, there was a significant difference between the mindfulness treatment group and the control group in the mean scores of emotional regulation in the post-test stage.

Table 4. Results of univariate covariance analysis to comparing emotional regulation in the groups

Source of changes	Sum of square	Degree of freedom	Mean Square	F	P	Effect size
Pre-test	431.58	1	431.58	61.28	0.001	0.69
Group	965.63	1	965.63	137.11	0.001	0.83
Error	190.14	27	7.04			
Total	1247.36	29				

Also, the adjusted means for the mindfulness treatment group and the control group in emotional regulation were 39.57 and 27.28, respectively, and the results indicated a significant difference between the two groups in the mean scores of the emotional regulation in post-test. Moreover, this difference was in favor of mindfulness therapy. The results of Table 5 show that there was a significant difference between the cognitive avoidance of depressed people participating in the mindfulness treatment group and the control group. Also, after controlling the pre-test scores, the effect of the group on cognitive avoidance in the post-test stage was significant (F= 2554.99, $P < 0.001$).

In other words, there was a significant difference between the two groups in the mean scores of cognitive avoidance in the post-test stage.

Table 5. Results of univariate covariance analysis comparing cognitive avoidance in the groups

Source of changes	Sum of square Source	Degree of freedom	Mean Square	F	P	Effect size
Pre-test	220.69	1	220.69	29.60	0.001	0.52
Group	19049.45	1	19049.45	2554.99	0.001	0.99
Error	201.30	27	7.45			
Total	19473.20	29				

Also, the adjusted means for the mindfulness treatment group and the control group in cognitive avoidance were 50.60 and 102.19, respectively, and the above findings indicated a significant difference between the two groups in the mean scores of the cognitive avoidance in post-test stage. Moreover, this difference was in favor of mindfulness treatment.

Discussion

In the present study, we assessed the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on three important components of depression, i.e., rumination, emotional regulation, and cognitive avoidance. The results showed significant differences in the mean scores of rumination, emotional regulation, and cognitive avoidance between the experimental and control groups. MBCT reduces cognitive avoidance and rumination and helps emotional regulation, so it effectively reduces depression.

Many studies have shown that cognitive therapy based on mindfulness is an effective treatment for depression. In line with the current research, Mousavi et al. investigated the rumination of 30 depressed students of Ahvaz city-Iran using the rumination response style questionnaire. They showed the effectiveness of this treatment (23). Also, Shih et al. showed the effectiveness of cognitive therapy based on mindfulness on 57 depressed elderly patients (24). Barmal et al. also assessed 20 depressed female students. They showed that mindfulness could help reduce depression and mental rumination and improve problem-solving and cognitive regulation (25). In a meta-analysis study on 61 studies and 4229 patients, Mao et al. showed the effectiveness of this treatment in reducing rumination (26).

In 2019, Shahsawari et al. studied 30 medical students of Kerman University. They concluded that cognitive therapy based on mindfulness was effective in mental distress (27). In addition, Mussa et al. analyzed the results of fifteen studies. They concluded that MBCT is an effective treatment to reduce the symptoms of depression. So, they recommended MBCT to physicians, nurses, and mental health professionals (28). In this

regard, Khadem et al.'s research on 30 women with obsessive-compulsive disorder in Neka city-Iran showed that MBCT treatment is a useful and effective method for reducing rumination (29). Also, Gharib Dost et al.'s research on 30 married women with obsessive-compulsive disorder in Tehran-Iran showed the effectiveness of MBCT treatment in reducing cognitive avoidance (30). Power et al.'s research on 46 depressed black adults also showed the effectiveness of this treatment in reducing the level of depression (31). Garcia-Toro et al. compared three approaches that include (a) Minimal Lifestyle Intervention (MLI), (b) Mindfulness-Based Cognitive Therapy (MBCT), and (c) Lifestyle Modification Program (LMP) on 66 depressed patients using the Beck Depression Inventory-II (BDI-II) and Experiential Avoidance Questionnaire. They concluded that among these interventions, cognitive therapy based on mindfulness is the most effective method to reduce depression, which is in line with the present research (32). Among the limitations of the current research is its statistical sample, which should be cautious in generalizing the results. Based on this, it is recommended that due to the limited sample of the research, this comparison should be done in a wider sample and by separating other mental disorders.

One of the implications of the present study was the use of MBCT to reduce rumination, regulate negative emotions, and cognitive avoidance in people with depression. Also, in this research, we showed how a depressed person can observe situations and conditions that do not require avoidance and escape through mindfulness therapeutic strategies. Instead, the person accepts all of them as his current thoughts.

Conclusion

Based on the findings, Mindfulness-Based Cognitive Therapy (MBCT) is suggested to therapists as an effective and preventive psychotherapy method to reduce emotional problems and psychological damage in the process of treating depression.

Authors' Contributions
Somayeh Afshar: Design of study and conducting intervention, writing draft of manuscript. Negar Asgharipour Zahmati: Supervising on the process of study, editing the manuscript, and aiding in revision process. Fatemeh Alidoosti: Aiding in the research process and writing the manuscript.

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