

# Comparison of the Effectiveness of Mindfulness-Based Cognitive Therapy and Behavioral Activation on Irrational Thoughts and Depression in Generalized Anxiety Disorder

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## Article Info

### Article type:

Original Research

### How to cite this article:

Asvadi Ghoshe Gonabadi, J., Bakhshipour, A., & Akbari Armaghan, H. (2024). Comparison of the Effectiveness of Mindfulness-Based Cognitive Therapy and Behavioral Activation on Irrational Thoughts and Depression in Generalized Anxiety Disorder. *Journal of Assessment and Research in Applied Counseling*, 6(1), 204-211.

<http://dx.doi.org/10.61838/kman.jarac.6.1.23>



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## ABSTRACT

**Objective:** The aim of the present study was to compare the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) and Behavioral Activation (BA) therapy on irrational thoughts and depression in individuals with Generalized Anxiety Disorder (GAD).

**Methods and Materials:** This applied research utilized a quasi-experimental method with a pre-test and post-test design. The statistical population included all individuals diagnosed with GAD who visited psychotherapy clinics in Mashhad in 2020. From this population, 45 participants were purposefully selected from the Nabz-e Zindagi Counseling Center in Mashhad and randomly assigned to three groups of 15 (two experimental groups and one control group). The subjects responded to the Irrational Beliefs Test (IBT) by Ahwaz and Mo'tamedi (2005) and the Beck Depression Inventory (BDI) (1961) at three stages: pre-test, post-test, and follow-up. The MBCT and BA therapies were administered to the experimental groups, while the control group did not receive any treatment. Data were analyzed using SPSS software.

**Findings:** The results indicated that the main effect of the group on irrational thoughts and depression was significant in both experimental groups ( $p < .05$ ). However, there was no significant difference in the impact of the two methods on irrational thoughts ( $p = .144$ ) and depression ( $p = .950$ ).

**Conclusion:** Both treatments were equally effective in individuals with GAD. Therefore, both treatments can be utilized to reduce psychological problems in individuals with GAD.

**Keywords:** Generalized Anxiety Disorder, Depression, Irrational Thoughts, Mindfulness-Based Cognitive Therapy, Behavioral Activation.

## 1. Introduction

Anxiety is one of the most prevalent mental disorders, arising from the association with an unknown danger, leading to a disruption in the continuity of an individual's behavior (Chavanne & Robinson, 2020). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), Generalized Anxiety Disorder (GAD) is a chronic disorder characterized by excessive and persistent worry (American Psychiatric Association, 2022). This worry must be present most days for at least six months, be difficult to control, and be accompanied by symptoms such as muscle tension, irritability, restlessness, and difficulty sleeping (Goenka et al., 2022). The prevalence of the disorder is estimated to be between 0.4% and 3.6%, with a lifetime risk of 9% (Ren et al., 2020).

Individuals with GAD are socially anxious, despondent, and depressed, and have low health and quality of life (Fuller-Thomson et al., 2022). Studies show that 59% of individuals with GAD meet the diagnostic criteria for depression (Kennedy et al., 2019), which is characterized by a set of symptoms including sadness, loss of interest, decreased personal and social functioning, changes in thoughts, sleep and eating patterns, and reduced energy levels, all of which have detrimental effects on thinking, behavior, and emotions (Dimidjian et al., 2008). According to the World Health Organization, depression is the leading cause of disability worldwide (Hatch et al., 2019).

In addition to depression, another variable examined in this study is irrational thoughts, which play a complex role in the onset of mental illnesses (Serine et al., 2020). Irrational thoughts are biased, rigid, and inflexible beliefs characterized by demands and musts (Li et al., 2022). These include the expectation of approval from others, excessive self-expectation, blaming others, helplessness reactions to frustration, emotional irresponsibility, avoidance of problem confrontation, dependency beliefs, helplessness to change, and perfectionism (Tecuta et al., 2021). These thoughts are incongruent with reality and based on conjecture, leading to conflict and preventing individuals from successfully coping with life events (Yousefi & Monirpoor, 2022). They are compulsive tendencies that cause distress and anxiety in individuals (Huk et al., 2019).

Given the high prevalence and negative consequences of GAD, addressing therapeutic approaches is of significant importance. One of the treatment approaches used in this study is Mindfulness-Based Cognitive Therapy (MBCT), which is a structured eight-session short-term intervention

focused on shifting patients' attention towards their negative cognitions and managing them. The goal of the therapy is to establish a different relationship with thoughts, feelings, and emotions, involving maintaining full and moment-to-moment attention with an attitude of acceptance and non-judgment (Williams et al., 2008). Studies indicate that this therapy has a significant impact on GAD (Pourfaraj & Miladi, 2022) and on anxiety and dysfunctional attitudes (Hazlett-Stevens, 2022). Another therapy used in the study is Behavioral Activation (BA) therapy, one of the widely used methods emerging from the third wave of psychotherapy (Russo et al., 2018). The goal of BA is to increase individuals' access to reinforcing sources, identify daily interferences, depressive avoidance patterns, and change skill deficits (Janssen et al., 2020). The effectiveness of this method on GAD (Hirayama et al., 2019) and depression (Kiaeian-Mousavi et al., 2022) has been positively evaluated. Since psychological treatments should aim to differentiate effective from ineffective treatments, clinicians need criteria to determine whether a treatment is clinically meaningful. These criteria will also help psychologists review the results of previously published treatments. Therefore, comparing the effects of MBCT and BA therapy will lead to the correct selection of treatment by therapists and reduce unsuccessful treatment cases.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study, based on its aim, is an applied semi-experimental research with a pre-test and post-test design, including two experimental groups and one control group. The statistical population comprised all individuals diagnosed with GAD who visited psychotherapy clinics in Mashhad in 2020. Using convenience sampling, 45 individuals were selected from the Nabz-e Zindagi Psychotherapy Clinic and randomly assigned to three groups of 15 (two experimental groups and one control group). Inclusion criteria included a GAD diagnosis using questionnaires and interviews, at least one year since diagnosis, age between 20 to 50, and informed consent to participate. Exclusion criteria included receiving psychological interventions in the past year, serious suicidal thoughts assessed through clinical interviews, and absence from more than two sessions. Before the intervention, participants were asked to respond to the mentioned questionnaires (pre-test). Due to the COVID-19 pandemic and the need for social distancing, sessions were

significantly delayed, and eventually, MBCT sessions were conducted according to the program by Kabat-Zinn (1994) and BA therapy according to the group protocol by Dimidjian, Martell, Addis, and Herman-Dunn (2008) in eight sessions, adhering to social distancing and health protocols (using masks, gloves, and sanitizing patients on-site). After the intervention, participants were asked to complete the questionnaires again (post-test). Data were analyzed using SPSS 26 software. This study was conducted with the ethical code IR.IAU.BOJNOURD.REC.1399.038 from the Islamic Azad University of Bojnourd.

## 2.2. Measures

### 2.2.1. Generalized Anxiety Disorder

This scale, designed by Spitzer, Kroenke, Williams, and Berndt (2006), consists of 7 main questions and an additional question assessing the disorder's interference with individual, social, family, and occupational functions. The highest score on the scale is 21. In Iran, Nainian, Shoaie, Sharifi, and Hadian (2011) reported a Cronbach's alpha of .85 and a test-retest reliability of .48. Spitzer et al. (2006) reported an excellent internal consistency (Cronbach's alpha = .92) and good test-retest reliability (.83) (Naeinian et al., 2011; Pourfaraj & Miladi, 2022). In this study, the tool's reliability was obtained with a Cronbach's alpha of .89.

### 2.2.2. Irrational Beliefs

The short form of this test was designed by Abadi and Mo'tamedi (2004) in Iran, including four factors: helplessness for change, demand for approval from others, problem avoidance, and emotional irresponsibility. The questionnaire is scored on a 5-point Likert scale ranging from strongly disagree to strongly agree. A score above 120 indicates strong irrational beliefs. Abadi and Mo'tamedi (2004) reported the following Cronbach's alpha coefficients: first factor .80, second factor .81, third factor .73, fourth factor .75, and the whole test .75. Nasri et al. (2016) reported Cronbach's alpha coefficients of .75 for helplessness for change, .87 for demand for approval, .73 for problem avoidance, and .65 for emotional irresponsibility, with .87 for the whole test (Barghi Irani & Dehghan Saber, 2021; Motamedin et al., 2012; Yousefi & Monirpoor, 2022). In this study, the Cronbach's alpha coefficients were .71 for helplessness for change, .85 for demand for approval, .70 for problem avoidance, .66 for emotional irresponsibility, and .84 for the whole test.

### 2.2.3. Depression

The Beck Depression Inventory was first developed by Beck et al. (1961). It includes 21 items, with responses on a 4-point scale from 0 to 3. This scale measures varying degrees of depression from mild to severe, with scores ranging from 0 to 63. Scores of 0 to 13 indicate minimal depression, 14 to 19 mild depression, 20 to 28 moderate depression, and 29 to 63 severe depression. Beck et al. (1996) reported a test-retest reliability of .93 over one week, and Motabi et al. (2011) in a sample of 94 individuals in Iran reported a Cronbach's alpha of .91 and a test-retest reliability of .96 over one week (Kiaeian-Mousavi et al., 2022; Olyaie et al., 2022).

## 2.3. Interventions

### 2.3.1. The Mindfulness-Based Cognitive Therapy

The Mindfulness-Based Cognitive Therapy (MBCT) protocol, based on Kabat-Zinn's (1992) framework, is an eight-session intervention designed to help individuals with Generalized Anxiety Disorder (GAD) develop mindfulness and awareness of their thoughts and emotions. The sessions focus on cultivating a different relationship with thoughts and feelings through mindfulness practices, aiming to reduce anxiety and depression symptoms by promoting a non-judgmental and accepting attitude towards one's experiences. Each session builds on the previous one, progressively teaching techniques that enhance the individual's ability to stay present and manage negative cognitions effectively (Olyaie et al., 2022; Williams et al., 2008).

#### Session 1: Automatic Pilot

Introduce group members and invite them to introduce themselves to each other. Provide an explanation about Generalized Anxiety Disorder and conduct a pre-test. Assign homework.

#### Session 2: Dealing with Barriers

Review homework and discuss clients' feelings about the anxiety they experienced over the past week. Teach muscle relaxation techniques for 14 muscle groups. Assign homework.

#### Session 3: Mindful Breathing

Review homework and teach the breathing in and out technique calmly without thinking about anything else. Instruct on the technique of observing the breath and mindful breathing before sleep. Assign homework.

#### Session 4: Being in the Present Moment

Review homework and conduct five minutes of visual or auditory mindfulness. Teach the technique of focusing on body movements while breathing. Assign homework.

Session 5: Acceptance/Allowing to Stay

Review homework and teach attention to the mind, allowing thoughts to enter and exit easily without judgment, and paying deep attention to them. Assign homework.

Session 6: Thoughts Are Not Facts

Review homework and practice a few minutes of daily exercise. Train in observing the connection between activity and mood. Assign homework.

Session 7: Taking Care of Yourself

Review homework and conduct sitting meditation, awareness of breathing, and understanding the relationship between activities and mood. Prepare for the end of the therapy and summarize.

Session 8: Using What You Have Learned

Apply what has been learned to cope with future mood situations. Complete the meditation, finish the course with the last meditation, and conduct a post-test.

### 2.3.2. Behavioral Activation

The Behavioral Activation (BA) protocol, based on the therapeutic guidelines by Dimidjian et al. (2008), is an eight-session intervention aimed at individuals with Generalized Anxiety Disorder (GAD). This protocol emphasizes the identification and engagement in activities that align with the individual's values and goals, thereby increasing positive reinforcement and reducing depressive and anxious symptoms. The sessions focus on monitoring daily activities, identifying patterns of avoidance, and progressively incorporating more rewarding and value-driven activities into the individual's routine. Each session is structured to build skills that help individuals take active steps towards improving their mood and functioning through meaningful activities (Dimidjian et al., 2008).

Session 1

Introduce the group and outline group rules. Provide the anxiety contextual pattern sheet and introduce the Behavioral Activation model. Provide Form 1 and conduct a pre-test. Assign homework.

Session 2

Review homework and present the Behavioral Activation model. Begin recording daily activities and select two pleasurable and two mastery activities, committing to perform them until the next week.

Session 3

Review homework, select activities, and rank them. Discuss values and activities (Form 2), prioritize life values, and practice the skill of acting from the outside in. Assign homework.

Session 4

Review homework and continue examining the inventory of life areas. Choose two types of activities in line with each value (practically, specifically, and tangibly). Assign homework.

Session 5

Review homework, select and rank activities (Form 3), choose three to four easy valuable activities (based on Form 3) throughout the week. Assign homework.

Session 6

Review homework, provide the stress sheet, and discuss the role of personal stressors in anxiety. Select several valuable activities and draft contracts (Form 4). Assign homework.

Session 7

Review homework and evaluate life values and activities. Teach self-care skills, functional assessment, and provide necessary techniques to restart activities. Prepare for termination.

Session 8

Review homework, discuss the completed workshop and changes made, rank activities, determine a new activity with a higher difficulty level, and establish a new contract (Form 4) for cooperation and execution of the activity. Conduct a post-test.

### 2.4. Data analysis

Descriptive statistics (frequency, percentage, and mean charts) and inferential statistics (Shapiro-Wilk test, repeated measures ANOVA, and Bonferroni post hoc test) were used for data analysis. Data analysis was performed using SPSS software version 24.

## 3. Findings and Results

The mean age of participants in the study was 32.93 years in the Mindfulness-Based Cognitive Therapy (MBCT) group, 29.86 years in the Behavioral Activation (BA) group, and 34.33 years in the control group. Regarding education, 16 participants had less than a high school diploma, 6 had an associate degree, 16 had a bachelor's degree, and 7 had a master's degree or higher. Among the participants, 27 were married and 18 were single. Additionally, 37 participants were employed, and 8 were unemployed.

**Table 1**

*Descriptive Statistics of Study Variables by Group and Test Stage*

Variable	Time	MBCT - Mean (SD)	BA - Mean (SD)	Control - Mean (SD)
Irrational Thoughts	Pre-test	118.80 (23.28)	121.86 (25.12)	123.40 (26.95)
	Post-test	79.86 (19.84)	99.33 (20.22)	122.20 (26.92)
	Follow-up	83.00 (20.67)	103.53 (20.49)	122.40 (25.61)
Depression	Pre-test	23.86 (5.76)	24.66 (7.71)	28.60 (7.88)
	Post-test	15.80 (3.78)	19.40 (7.00)	27.80 (8.05)
	Follow-up	17.40 (3.97)	20.40 (6.91)	28.26 (7.72)

According to Table 1, regarding irrational thoughts and depression showed a decrease in the mean values in both intervention groups. In the control group, the mean values had little change. The results of the Box's test showed that the assumption of equality of covariance matrices was met ( $P = 0.350$ ). The results of Levene's test also indicated that

the assumption of equality of error variances was met. The null hypothesis for the normal distribution of scores in all three groups for the variables of irrational thoughts and depression was also confirmed. Further, repeated measures ANOVA and ANCOVA were used to test the hypotheses.

**Table 2**

*Results of Repeated Measures ANOVA for the Effectiveness of MBCT and BA on Irrational Thoughts and Depression*

Treatment	Source	Sum of Squares	df	Mean Square	F	p	
Time		5078.400	1	5078.400	402.591	0.000	
	MBCT (Irrational Thoughts)	Time * Group	4541.400	1	4541.400	360.020	0.000
	Error	353.200	42	12.614			
Time		1401.66	1	1401.66	114.533	0.000	
	BA (Irrational Thoughts)	Time * Group	1126.66	1	1126.66	92.062	0.000
	Error	342.66	42	12.238			
Time		173.40	1	173.40	104.338	0.000	
	MBCT (Depression)	Time * Group	141.06	1	141.06	84.883	0.000
	Error	46.533	42	1.662			
Time		79.350	1	79.350	76.263	0.000	
	BA (Depression)	Time * Group	58.01	1	58.01	55.760	0.000
	Error	29.133	42	1.040			

The findings in Table 2 indicate that the intervention effect of MBCT and BA on irrational thoughts and depression was significant ( $p < 0.05$ ), meaning that the mean

values of irrational thoughts and depression showed significant changes in the post-test stage in both groups.

**Table 3**

*Results of Between-Group ANOVA for the Effectiveness of MBCT and BA on Irrational Thoughts and Depression*

Variables	Source	Sum of Squares	df	Mean Square	F	p	Eta Squared	Power
MBCT (Irrational Thoughts)	Group	18633.6	1	18633.6	10.834	0.003	0.569	0.612
	Error	48158.4	42	1719.9				
BA (Irrational Thoughts)	Group	4680.01	1	4680.01	2.642	0.015	0.493	0.598
	Error	30005.9	42	1154.1				
MBCT (Depression)	Group	1904.400	1	1904.400	15.537	0.035	0.811	0.662
	Error	3432.089	42	122.575				
BA (Depression)	Group	1020.10	1	1020.10	5.993	0.021	0.753	0.657
	Error	41184.9	42	1470.892				

Based on the results in Table 3, the main group effect for the variable of irrational thoughts in the MBCT group ( $F =$

10.834,  $p \leq 0.003$ ) and the BA group ( $F = 2.642$ ,  $p \leq 0.015$ ) and for the variable of depression in the MBCT group ( $F =$

15.537,  $p \leq 0.000$ ) and the BA group ( $F = 5.993$ ,  $p \leq 0.021$ ) was significant. This means that the main group effect on irrational thoughts and depression was significant.

**Table 4**

*Bonferroni Post-Hoc Test Results for Pairwise Comparison of Mean Irrational Thoughts and Depression by Treatment Approaches*

Group	Comparison	Mean Difference	Std. Error	p
Irrational Thoughts	MBCT vs. BA	-14.35	8.50	0.296
	MBCT vs. Control	-28.77	8.50	0.005
	BA vs. MBCT	14.35	8.50	0.296
	BA vs. Control	-14.42	8.50	0.003
	Control vs. MBCT	-9.86	8.50	0.005
	Control vs. BA	-10.86	8.50	0.003
Depression	MBCT vs. BA	-2.46	2.43	0.950
	MBCT vs. Control	-9.20	2.43	0.001
	BA vs. MBCT	2.46	2.43	0.950
	BA vs. Control	-6.73	2.43	0.025
	Control vs. MBCT	9.20	2.43	0.001
	Control vs. BA	6.73	2.43	0.025

According to [Table 4](#), the mean difference in irrational thoughts ( $p > 0.296$ ) and depression ( $p > 0.950$ ) between MBCT and BA was not significant in the post-test and follow-up stages, indicating similar effectiveness of both treatments on depression and irrational thoughts.

#### 4. Discussion and Conclusion

The aim of the present study was to compare the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) and Behavioral Activation (BA) on irrational thoughts and depression in individuals with Generalized Anxiety Disorder (GAD). The first finding indicated that the intervention effect of MBCT and BA on irrational thoughts in individuals with GAD was significant ( $p < 0.05$ ), and both treatments similarly influenced irrational thoughts ( $p > 0.144$ ). This result is consistent with previous studies ([Barghi Irani & Dehghan Saber, 2021](#); [Walsh et al., 2019](#)). Regarding the effectiveness of MBCT on reducing irrational thoughts, it can be noted that this treatment reduces anxiety and stress by implementing techniques related to fundamental mindfulness components and, on the other hand, by changing cognitive patterns, improving thinking styles, and identifying cognitive errors, it enhances the ability to control thoughts and improves the handling of automatic and intrusive thoughts, leading to a reduction in irrational thoughts ([Pourfaraj & Miladi, 2022](#); [Sulosaari et al., 2022](#)). BA therapy, by involving individuals in rewarding activities and reducing ineffective behaviors, can reduce the cycle of rumination and consequently increase

cognitive flexibility, and by encouraging patients to persistently engage in behaviors inconsistent with anxious mood, it provides a basis for reducing irrational thoughts ([Walsh et al., 2019](#)).

The second finding indicated that the intervention effect of MBCT and BA on depression in individuals with GAD was significant ( $p < 0.05$ ), and both treatments similarly influenced depression ( $p > 0.129$ ). This result is also consistent with previous studies ([Hirayama et al., 2019](#); [Olyaei et al., 2022](#); [Salehi et al., 2024](#); [Singla et al., 2022](#)). In MBCT, the individual learns to pay more attention to the present moment and remove negative thoughts and beliefs that lead to depression from the mind. Additionally, the individual gains more awareness of bodily symptoms and can identify stress and depressive symptoms before becoming depressed ([Barghi Irani & Dehghan Saber, 2021](#)). BA therapy also organizes daily activities, which reduces helplessness and increases patient activity and participation in social activities ([Singla et al., 2022](#)).

#### 5. Limitations & Suggestions

This study faced some limitations, including the use of only questionnaires as the data collection tool, which may not provide precise information. The same therapist conducted both models, which may have led to interference effects. Participants' multiple responses to questionnaires (pre-test, post-test, and follow-up) may have been influenced by testing conditions, reducing the accuracy of their responses. Therefore, future studies should consider using

other data collection methods such as interviews. Given the effectiveness of BA and MBCT therapies for GAD, it is also recommended to emphasize the application of these therapeutic methods to other family members.

### Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study.

### Declaration of Interest

The authors of this article declared no conflict of interest.

### Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

### Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

### Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

### Authors' Contributions

All authors equally contributed in this article.

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