

Effectiveness of Mindfulness-based Cognitive Therapy on Irrational Beliefs and Anxiety among People with Borderline Personality Disorder

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Abstract

Background: It is necessary to help people with a personality disorder solve the problems related to this disorder and recognize the factors affecting irrational beliefs and anxiety and improve them using different approaches.

Objectives: This study aimed to investigate the effectiveness of mindfulness-based cognitive therapy on irrational beliefs and anxiety among people with a borderline personality disorder.

Methods: This semi-experimental study was conducted based on a pretest-posttest control group design and follow-up. The statistical population included women diagnosed with bipolar disorder referring to a counseling center in Tehran, Iran, within January-March 2020. The samples were selected by the convenience sampling method due to limitations in the sampling of patients. The research tools used to collect the necessary data included questionnaires, namely the Borderline Personality Test (1984), Beck Anxiety Questionnaire (1997), and Jones Irrational Beliefs Questionnaire (1968). The collected data were analyzed in SPSS software (version 22) using the repeated measure analysis of variance.

Results: The results showed that mindfulness-based cognitive therapy had a significant effect on decreasing anxiety ($P < 0.001$) and irrational beliefs ($P < 0.001$).

Conclusion: It can be concluded that mindfulness-based cognitive therapy affected irrational beliefs and anxiety among people with a borderline personality disorder.

Keywords: Mindfulness, Borderline personality disorder, Anxiety disorders

Introduction

A personality disorder is one of the most common mental and chronic disorders with a prevalence rate of 10-15% among the general population (1). According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), personality disorders are divided into three categories. A borderline personality disorder is one of the subgroups of these categories (2), which is a severe personality disorder characterized by serious and widespread emotional disorder, behavior, and cognition (3). Patients with borderline personality disorder have such typical characteristics as instability in self-control, personal goals, interpersonal relationships, and emotions, along with impulsivity, risk-agency, or hostility, and problems of identity, self-command, and empathy (4).

Another characteristic of people with a borderline personality disorder is incorrect cognitive and metacognitive beliefs about themselves and their identity, including an imbalance between their positive and negative dimensions (5-7). In a behavioral situation, such individuals only look at problems from one angle, which is the one that satisfies their interests. This can be due to inefficient psychological components, such as their wrong beliefs in dealing with problems and beliefs causing cognitive distortions and

negative emotions (8). It is believed that the problems in people with borderline personality disorder are originated from irrational beliefs (7). They also believe that no event can inherently cause psychological turmoil in humans since all stimuli and events are interpreted in the mind. Accordingly, compromises and emotional problems are interpreted and processed by the stimuli and events underlying inefficient and irrational thoughts and beliefs (9).

It should be noted that along with these problems, the presence of other comorbid disorders, including anxiety and depression, can cause numerous problems for such people. Anxiety refers to an unpleasant and ambiguous emotional state (10). Physical manifestations, such as paleness, tremors, nervous crisis, rapid heartbeat, sweating, internal convulsions (sometimes so painful that the person is curved), cause feelings of suffocation, dry mouth, and chest and leg pain. Anxiety disorders are common disorders in the general population. These disorders have various complications, are often chronic, and are resistant to treatment (11).

Anxiety disorders are among the most common groups of mental disorders and their prevalence is reported to be 17.7% (12). Almost a century ago, Freud coined the term Nowruz, which he believed came from

the restrained Libido. All human beings experience anxiety. Anxiety can be observed in two forms, namely trait anxiety and state anxiety. Some people may sometimes feel terrified (13). They are in a state of anxiety, and it is called state anxiety. There are another group of anxious people who are always anxious. They are prepared for anxiety and experience a type of chronic anxiety called trait anxiety (14).

Considering the raised issues, the relatively high statistics of people with borderline personality disorder indicating the presence of anxiety, and irrational beliefs in these people, treatments, such as mindfulness-based therapy, can be used to improve the mentioned variables (15). Mindfulness interventions are considered one of the third-generation or third-wave cognitive-behavioral therapies. Mindfulness is a meditation rooted in Eastern religious teachings and rituals, especially Buddhism (16). Kabat-Zinn (17) defines mindfulness as "the awareness that arises from paying attention, on purpose, in the present moment and non-judgmentally". Sado et al. (18) showed that patients with early-stage anxiety disorder progressed significantly and they made a special recovery in anxiety disorder in later stages.

Considering the prevalence of borderline personality disorder symptoms in clinical and non-clinical populations, the identification of the factors affecting it helps health professionals to implement targeted intervention programs for the treatment of this disorder. Since early maladaptive schemas play a crucial role in an individual's mental health, finding the most useful, cost-effective, and efficient methods for its improvement is vital, especially in people with a borderline personality disorder. To the best of our knowledge, few studies have been conducted on the effectiveness of mindfulness-based methods on mental health and improving anxiety, especially among people with a borderline personality disorder.

Objectives

Therefore, according to the above, this study aimed to examine the effect of mindfulness-based cognitive therapy on irrational beliefs and anxiety among people with a borderline personality disorder.

Methods

This semi-experimental study was conducted with a pretest-posttest control group design and follow-up. The statistical population included women (n=112) diagnosed with bipolar disorder referring to a counseling center in Tehran, Iran, within January-March 2020. To assign cases into two groups of normal and borderline personality, those who obtained a score of ≥ 12 from a clinical interview and the Borderline Personality Test were included in the study. The samples (n=32) were selected using the convenience sampling method and randomly assigned into two groups of mindfulness-based cognitive therapy and control (n=16 each). The sample size was determined

at 16 cases in each group (32 participants in total) based on G-power software and the effect size of 0.25, alpha of 0.05, and power of 0.80.

Inclusion criteria were obtaining a score of ≥ 12 from the Borderline Personality Test, being confirmed by the clinical psychologist based on DSM-5 criteria, being at the age range of 20-50 years, and lacking other physical disorders or illnesses during the study. On the other hand, the patients who had a physical illness and were absent for more than two sessions in the educational program were excluded from the study. Regarding the ethical considerations, the research objectives and procedures were explained to all individuals in written form, and they were informed of the right to leave the study at any time. Moreover, all participants were assured of anonymity and confidentiality in this study. This study was approved by the Ethics Committee of Islamic Azad University, Zahedan, Iran (IR.IAU.ZAH.REC.1399.006).

The research tools used to collect the necessary data included questionnaires, namely the Borderline Personality Test, Beck Anxiety Questionnaire, and Jones Irrational Beliefs Questionnaire, and educational packages of mindfulness-based psychotherapy. The samples (n=32) were selected by the available sampling method. These cases were people whose disease had already been diagnosed and were randomly assigned to the experimental and control groups. The subjects in the experimental groups (two groups) received dialectical behavior therapy (group 1) and mindfulness-based psychotherapy (group 2), while the control group did not receive any intervention. Before the beginning of the first session in the groups, the research questionnaires were given to the subjects of the groups (pre-test). The participants in both groups responded to the research questionnaires (post-test scores) after the end of the weekly mindfulness therapy sessions. Both groups took part in one session as a follow-up 2 months after the end of the sessions. The scores obtained by pre-test, post-test, and follow-up stages were analyzed statistically.

Borderline Personality Test

This 24-item questionnaire was developed by Claridge and Brooks (1984) (19), and the responses are based on a yes/no scale. The yes answer gets a score of one, and the no answer gets a zero score. Cronbach's alpha coefficient of 0.80 was reported for this scale. The concurrent validity scores of this tool with the scales of neuroticism and psychosis of the Eysenck Personality Questionnaire were obtained at 0.64 and 0.44, respectively (19). Moreover, the researchers reported the alpha coefficient for the total scale as 0.77 and the subscales of hopelessness, impulsivity and degrading symptoms, and stress-related paranoia as 0.64, 0.58, and 0.57, respectively (20). In this study, the concurrent validity and reliability (Cronbach alpha coefficient method) scores of this questionnaire were calculated at 0.71 and 0.77, respectively.

Beck Anxiety Inventory

Beck Anxiety Inventory is a 21-item self-report questionnaire prepared to measure anxiety severity in adolescents and adults (21). This tool has already been translated into Persian by researchers (24). The responses are rated on a 4-point Likert scale from 0-3 based on the severity of anxiety. Each item describes one of the most common anxiety symptoms (i.e., mental, physical, and phobia symptoms). Therefore, the total score of this questionnaire is obtained in the range of 0-63. The results of studies have shown that the questionnaire has high reliability, and its internal consistency coefficient and reliability (using test-retest method) are 0.92 and 0.75, respectively (22). In this study, the reliability of this questionnaire was estimated at 0.83 by Cronbach's alpha coefficient method.

Jones Irrational Beliefs Questionnaire (1968)

This tool was prepared to measure irrational beliefs. The 100-item original version consists of 10 factors, each of which examines a type of irrational thinking (23). Jones reported that the internal

consistency of 10 factors of irrational beliefs test was obtained at the range of 0.45-0.72, their tested coefficient was estimated at 0.92, and their concurrent validity with psychiatric problems was 0.61 (23). The Cronbach's alpha coefficients of the whole test and for factors of helplessness against change, the expectation of approval from others, avoidance of problem, and emotional responsibility were estimated at 0.75, 0.80, 0.81, 0.73, 0.75, respectively. Furthermore, the split-half reliability scores for the whole test and the factors were obtained at 0.76, 0.82, 0.84, 0.74, and 0.72, respectively (24). The reliability of this questionnaire in the present study was 0.76 by Cronbach's alpha coefficient method.

The intervention consisted of eight 90-minute educational sessions of mindfulness-based cognitive therapy performed weekly for 2 months. The training course was prepared based on the educational package proposed by Kabat-Zinn (17). The validity of the protocol has been confirmed by its developers and it has a high face and content validity (17).

Table 1. Mindfulness-based cognitive therapy sessions

First	Body checking exercises, meditation sessions, mindfulness exercises, and three-minute breathing exercises, all of which are examples of formal mindfulness exercises. The group was asked to choose an activity from their daily activities and pay close attention to their own moment-to-moment sensory experiences during the week. During every single session, everyone was allowed to discuss and review these experiences. In practicing bodily senses, group members learned that a conscious focus on different parts of the body, while seemed to be simple and easy, gave them the ability to have control over the process of mental activity. Therefore, in body control exercise, the ability to focus on body members and various ways of paying attention was expanded. By focusing on each area of the body, the members of the group were asked to imagine how the movement of air was during inhaling and exhaling, guiding the wind through the various parts and controlling them in this way to help them learn how to use the air as a tool to direct their attention.
Second	The members of the group were asked to record their daily experiences regarding desirable or pleasant events using a timetable. They had to pay attention to what happened when an event occurred; for instance, what bodily feelings did they experience? what thoughts and mentalities did emerge? what emotional or feeling state did happen? Subsequently, while recording an event, members of the group were asked to write down their thoughts at that moment. They got help from paying attention to their respiratory emotions, and as a result, they used it to establish the mind in the present moment. This process of focusing on the particular details and dimensions of the experience helps to separate them from deep mental activities.
Third	During the third week, members of the group were asked to perform the same affairs about unpleasant events. In this session, they recorded, analyzed, and reviewed experiences resulting from usual events, such as staying behind traffic lights, cleaning the floor, or contacting customer service. During the meditation sessions, the skills of focus and attention were nurtured. Group members learned how to focus their thoughts. Fostering the ability to establish the mind paves the way to generate conscious and mindful awareness and provides a broader range of our experiences.
Fourth	The primary purpose of this exercise was to facilitate understanding and perception of emotions, which is a combination of the consequences resulting from a situation plus an interpretation. The members of the group were invited to be in a relaxed state, close their eyes, and imagine themselves in an unpleasant situation. While imagining this picture, the various responses of group members to the situation indicated that their ultimate sense regarding a situation would be relatively directly determined by what they think.
Fifth	By merely adjusting their emotions, group members broke the chain of habitual reactions that were familiar to everyone, including unpleasant experiences, disgust, muscle contraction, and emotional stress, resulting from events and negative thought rumination. The key to this debate is to move toward positive thinking and friendship with the events that occur at any given moment. They were asked to remember the unpleasant experience that still haunted them during the meditation session and experience those thoughts with their physical sensations. This process is part of an overall movement to reinforce our relationships and embrace aspects of our experiences that are marginalized and exert an influence upon us. It is not an effort to change the problems, rather, the desire and determination to maintain the reality as it is. Group members would also find out how often problems arose in mind and could be modified by changing their feelings about those issues and turning them into positive effects. This session emphasized the need to feel and experience things as they were without judgment.
Sixth	The purpose of this session was to understand that not only what they thought had an impact on their emotions, their emotions also affected their thoughts. The learned mindfulness skills provided an opportunity to break the chain of reactive responses by paying attention to and focusing on the topics and developing the group members' viewpoints. Giving information and reminding them that their interpretations were influenced by various factors, such as their past experiences or mental state, helped them to be more careful when interpreting events. It can be assumed that such events were not necessarily representations of reality. Mindfulness can offer new ways to stay in the present, such as using the sensory experiences, conscious breathing, and sitting meditation, that were performed by the group members at this session.
Seventh	Thoughts are not facts. The subjects that we think about are only thoughts, and we have the choice not to act on them or to deal with them, or to consider them subjective altogether. In this session, the ways to get out of the negative mood and thoughts were taught to the members of the group, and they could use them as lenses and examine and observe their experiences more closely. This process of recognizing the existing patterns of thought can help us ruminate by sitting meditation and seeking other solutions. However, by reaching a broader perspective on our thinking process, we will be able to work on them cognitively with an attitude of inquiry.
Eighth	The group members learned that the process of focusing and paying attention to the created experiences was nothing but paying attention to consistency in feeling, experiencing, and observing these experiences accurately. All that is accomplished during mindfulness exercises is to understand the concept of avoiding constant repetitions and habitual behaviors. The first thing to be considered in performing these exercises is that we should set a specific goal and orientate our experiences. The purpose is to create awareness and mindfulness regarding the present reality and its resultant expertise and develop the desire and determination to maintain truth the way it is. Through employing this particular way of describing and recounting direct experiences, the members of the group learned that they should abandon their futile thinking about their experiences. Mindfulness guides us to purposeful and motivated attention to achieve the desired results.

The obtained data were analyzed in SPSS software (version 22) through descriptive statistics (mean±SD) and inferential statistics (Repeated measure ANOVA). Furthermore, the assumptions of the inferential test were investigated using Leven's test (to investigate the homogeneity of variances), Kolmogorov-Smirnov test

(for normality of data distribution), regression homogeneity test, and Mbox test.

Results

The mean age scores of the subjects in the experimental and control groups were obtained at 38.8 ± 10.4 and 40.7 ± 11.3 , respectively.

Table 2. Mean (standard deviation) scores of research variables in experimental and control groups

Variable	Group	Pre-test		Post-test		Follow-up	
		M	SD	M	SD	M	SD
Irrational beliefs	Experimental	79.86	8.74	68.53	8.12	68.80	8.02
	Control	80.00	8.59	80.53	8.70	80.46	8.77
Anxiety	Experimental	28.06	6.43	19.80	5.31	19.13	5.42
	Control	30.60	6.13	29.26	6.00	29.46	6.96

To significantly investigate the difference between irrational beliefs and anxiety scores among patients in the mindfulness-based cognitive therapy and control groups, repeated-measures ANOVA was used. Priorly, the results of Mbox, Mauchly sphericity, and Levene's tests were evaluated to comply with the assumptions. Since the Mbox test was not significant for any of the research variables, the homogeneity condition of variance-covariance matrices was correctly observed. Moreover, the non-significant p-value of Levine's test

variables indicated the equality of intergroup variances, and the variance of dependent variable error was equal in all groups. Finally, the Mauchly sphericity test results showed that this test was also used for the irrational beliefs variable, and anxiety was significant; therefore, the assumption of the equality of within-subjects variances (spherical assumption) was not observed (Mauchly's $W=0.61$, $P<0.001$). As a result, the Greenhouse Geiser test was used to investigate the single-variable test results for intra-group effects and interactions.

Table 3. Analysis of repeated measures analysis of variance for comparing the pre-test and post-test scores of research variables in experimental and control groups

Variable	Source	SS	Df	MS	F	P	Eta
Irrational beliefs	Time	230.46	1.43	160.14	79.16	0.001	0.73
	Time*Group	150.02	1.43	104.24	51.53	0.001	0.64
	Group	418.17	1	418.17	38.86	0.001	0.39
Anxiety	Time	446.06	1.35	329.75	155.08	0.001	0.84
	Time*Group	356.06	1.35	263.22	123.79	0.001	0.81
	Group	291.60	1	291.60	21.38	0.001	0.22

The results of Table 3 indicate that the analysis of variance is significant for the within-subject factor (Time) and between-subject factor (Group) for irrational beliefs and anxiety. Based on the findings, mindfulness-based cognitive therapy had a

significant effect on decreasing anxiety ($P<0.001$) and irrational beliefs ($P<0.001$). The results of the Bonferroni post hoc test applied to compare the pair difference of the measurement steps are presented in Table 4.

Table 4. Summary of the results of Bonferroni post hoc test for irrational beliefs and anxiety

Dependent variable	Steps		Mean difference	Standard deviation error	P
Irrational beliefs	Pre-test	Post-test	-23.37	1.48	0.001
	Pre-test	Follow-up	-29.22	1.67	0.001
	Post-test	Follow-up	-5.84	1.53	0.001
Anxiety	Pre-test	Post-test	11.82	1.06	0.001
	Pre-test	Follow-up	16.40	1.21	0.001
	Post-test	Follow-up	4.57	1.23	0.025

The results of the Bonferroni test in Table 4 show that there is a significant difference among the pre-test, post-test, and follow-up stages in terms of the total scores of irrational beliefs ($P < 0.01$). It was also revealed that the subjects experienced a significant decrease in the scores in the post-test and follow-up stages, compared to the pre-test stage. There was a significant difference in the total score of anxiety among all stages of research (pre-test, post-test, and follow-up; $P < 0.001$). According to the results, mindfulness-based cognitive therapy was effective on irrational beliefs and anxiety among people with borderline personality disorder, and the results remained stable until the end of the follow-up period.

Discussion

This study aimed to investigate the effectiveness of mindfulness-based cognitive therapy on irrational beliefs and anxiety among people with a borderline personality disorder. The first finding of this study was that mindfulness-based cognitive therapy effectively affected irrational beliefs among individuals with a borderline personality disorder. The results of this study were in line with those of studies conducted by Sado et al. (18), Helmes and Ward (25), Yousefi et al. (26), and Docteur et al. (27).

Regarding the effectiveness of mindfulness-based cognitive therapy on the irrational beliefs of people with borderline personality disorder, it can be said that mindfulness-based cognitive therapy is a change and modification of behavioral-cognitive therapy and is used for individuals struggling with out-of-control emotions and mood and emotional issues, such as anxiety and irrational beliefs. This is one reason why dialectical behavior has been effective in improving irrational beliefs (7). People with a borderline personality disorder that have difficulty in controlling impulses are increasingly impulsive and irresponsible, mainly recognized by the lack of regulation of negative emotions. Additionally, a lack of regulation of positive emotions occurs, which causes irrational and superficial excitement. Since individuals with borderline personality disorder lack logical thinking and try to avoid social obligations and compulsions, they can neither have a planned and premeditated behavior nor pay attention to their actions (8). According to this finding, it can be said that mindfulness-based cognitive therapy leads to increased emotional stability and interpersonal characteristics. These people are more aggressive because of temperamental infrastructural issues or the failure in satisfaction of their basic needs by insensitive caregivers. They have always been involved in a dependence-independence relationship, leading to experiencing ambivalence and unstable relationships and modes of emptiness and seeking overly close relationships or ideal fusion (9). Mindfulness-based cognitive therapy training results

in identifying communication styles, the proportion between one's and others' desires, individual relationships, and problems of individual relationships, which will lead to a decrease in irrational beliefs among individuals with a borderline personality disorder.

The finding of this study showed that mindfulness-based cognitive therapy decreased anxiety in people with a borderline personality disorder. The results of this study were in line with those of studies performed by Cotton et al. (28), Wong et al. (29), Sepanta et al. (30), Burgess et al. (31), and Thomas et al. (32). In explaining this finding, it can be said that in mindfulness-based cognitive therapy, a person learns to be conscious of emotional state at any moment and focuses his/her attention on different ways of emotional occurrence. Consequently, mindfulness-based cognitive therapy enables a person to reduce his/her anxiety by accepting the state of self-judgment and changing the factors that need to be changed (problem-solving). Anxiety in people with a borderline personality disorder is indicative of general and common feelings of individuals most of the time (27).

Mindfulness-based cognitive therapy has a clear structure and uses behavioral techniques; therefore, the effectiveness of this method is related to the application of accreditation. This validation is associated with the acceptance of emotional problems, which ultimately leads to the facilitation of changes. Treatment includes dialectical principles and techniques (e.g., self-observation); these techniques lead to stability of results. In addition, mindfulness-based cognitive therapy, by combining mindfulness exercises with behavioral exercises, makes people with a borderline personality disorder observe their emotional states and disorders without judgment, try to accept the existence of this state and tolerate it, and learn the mechanism of passing through this situation. The use of these exercises ultimately leads to distance from emotions, reduction in rumination, and creation of positive emotions (28).

One of the limitations of this study was related to the external validity since the statistical population of the study consisted of a specific group of the population (i.e., people with borderline personality disorder in Tehran); consequently, the possibility of generalizing the results to the whole society is limited. Another limitation of the study was related to the data collection tool, which was self-report scales. Regarding this, the feedback or opinions and self-report of individuals about themselves obtained from these tests might differ from what could be observed in the individuals' real actions and behaviors. The other limitation was attributed to the nature of the study, which was semi-experimental, and therefore, lacked the advantages of actual experimental projects. It is recommended to use a specialist as a

therapist and treatment education in future studies to reduce the probability of bias in the research. Moreover, it is suggested to perform the research in other cities and evaluate the obtained results. This research should be followed up after group training as individual counseling. finally, it is offered that interviews, rather than self-reporting tools, be employed in future pieces of research.

Conclusion

Based on the findings of this study, it can be said that mindfulness-based cognitive therapy affected irrational beliefs and anxiety in people with a borderline personality disorder.

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