



Effectiveness of Mindfulness-Based Cognitive Therapy on Anxiety and Self-Care in Patients with Hypertension

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ABSTRACT

The aim of this study was to determine the effectiveness of mindfulness-based cognitive therapy on anxiety and self-care in patients with hypertension. The research method was quasi-experimental, employing a pre-test and post-test design with a control group. The statistical population of this study consisted of patients with hypertension who visited health centers in Tehran during the three months of the winter season in the year 2022. From this population, 30 individuals were selected through convenience sampling and randomly assigned to two groups: an experimental group (15 people) and a control group (15 people). In this study, anxiety and self-care questionnaires were used. The experimental group received eight 2-hour sessions of mindfulness-based cognitive therapy, while the control group did not receive any specific intervention. The findings showed that anxiety and self-care scores in the post-test were reduced compared to the pre-test in the experimental group. Therefore, mindfulness-based cognitive therapy has an impact on anxiety and self-care in patients with hypertension.

Keywords: *mindfulness-based cognitive therapy, anxiety, self-care, patients with hypertension.*

1. Introduction

The most significant causes of mortality worldwide are chronic medical conditions. Hypertension is a prevalent, asymptomatic issue that is easily identifiable and treatable. Due to its high prevalence and association with cardiovascular diseases, hypertension is a significant

healthcare problem in both industrialized and developing countries. Hypertension is one of the main threats to human health, particularly in developing countries such as Iran. Genetic, environmental, psychological, and social factors play a substantial role in the development of hypertension (1).

Various studies have shown the impact of psychological factors, such as anxiety and stress, on the development of cardiovascular diseases, including hypertension. The physiological mechanisms regulating blood pressure may be influenced by psychological stress. Among these mechanisms, the activation of the sympathetic nervous system is a key factor. When the autonomic nervous system releases a large amount of stress hormones, it leads to numerous physiological consequences, including hypertension, stomach ulcers, and migraines (2).

Anxiety is a general, vague, and highly unpleasant feeling of unease accompanied by one or more physical sensations such as shortness of breath and palpitations. While some anxiety is considered necessary for daily life, excessive anxiety can have serious negative effects on physical health, mental health, social relationships, career, and education, depriving the individual of an acceptable quality of life. Anxiety disorders are among the most common psychiatric disorders in women. According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (2022), anxiety is an unpleasant emotional experience with physical symptoms. Unlike depression, which is a reaction to loss and focused on the past, anxiety is a reaction to threat and focused on the future, encompassing dangers, lack of support, and unfamiliar stimuli (3). Additionally, stress is a process through which environmental events threaten or challenge the well-being of the organism, to which the organism responds. Anxiety can also increase individuals' irritability, thereby increasing the likelihood of various disorders. The lifetime prevalence of anxiety disorders in women is twice that of men, with a lifetime prevalence of 35% and an annual prevalence of 13% (1, 4).

Self-care refers to acquired, conscious, and purposeful actions that people undertake for themselves, their children, and their families to stay healthy, protect their mental and physical health, meet their social and psychological needs, prevent diseases and accidents, manage chronic conditions, and protect their health after acute illness and hospital discharge. Self-care clearly increases efficiency and individual skills and is one of the main concepts emphasizing healthy behavior (5). Self-care is the most important form of primary care, both in developed countries with better health infrastructure and higher literacy levels,

and in developing countries where most people are poor and have less access to specialized medical care (6).

Mindfulness-based cognitive therapy (MBCT) is a therapeutic approach that teaches individuals how to redirect their automatic thoughts, habits, ruminations, negative thoughts, and feelings, to become aware of them, and to view their thoughts and feelings from a broader perspective (7). Mindfulness can be described as a non-judgmental, accepting awareness of the present moment. Mindful individuals perceive internal and external realities freely and without distortion and have a great ability to face a wide range of thoughts, emotions, and experiences, whether pleasant or unpleasant. It teaches individuals to accept that thoughts and feelings exist instead of trying to forcefully control or suppress negative thoughts. In other words, mindfulness-based cognitive therapy equips individuals with the coping skills needed to manage risky situations (8).

In this context, the present study aims to answer the question: Does mindfulness-based cognitive therapy affect anxiety and self-care in patients with hypertension?

2. Methods and Materials

2.1. Study Design and Participants

The research method was quasi-experimental, employing a pre-test and post-test design with a control group. The statistical population of this study consisted of patients with hypertension who visited health centers in Tehran during the three months of the winter season in the year 2022. From this population, 30 individuals were selected through convenience sampling and randomly assigned to two groups: an experimental group (15 people) and a control group (15 people). Anxiety and self-care questionnaires were used in this study. The experimental group received eight 2-hour sessions of mindfulness-based cognitive therapy, while the control group did not receive any specific intervention.

2.2. Measures

2.2.1. Anxiety

This questionnaire, developed by Spielberger, consists of two parts that assess state and trait anxiety. It contains 40 short questions, both positive and negative, with four options for each question. The options are rated on a scale of 1 to 4

(very low, low, medium, high). Scores range from 20 to 80. Hosseini assessed the reliability of this questionnaire with a Cronbach's alpha of 0.79 for the trait section and 0.94 for the state section, and its content validity was confirmed by experts in statistics and psychology (16). The scores range from 40 to 160 for each individual. The Cronbach's alpha for the state and trait anxiety scales were reported to be 0.92 and 0.90, respectively, with test-retest reliability coefficients of 0.62 and 0.068, respectively (9).

2.2.2. Self-Care

Developed by Pouyanfar and colleagues (2020), this questionnaire contains 15 questions and measures self-care behaviors on a five-point Likert scale (1 = very low, 2 = low, 3 = medium, 4 = high, 5 = very high). Scores range from 15 to 75, with higher scores indicating higher levels of self-care. The Cronbach's alpha for this scale was reported to be 0.87 by the developers, and its validity was evaluated and confirmed by mental health specialists and psychologists. Asadi et al. (2020) reported a Cronbach's alpha of 0.88 for this scale. The present study found a Cronbach's alpha of 0.87 for the questionnaire (10).

2.3. Intervention

2.3.1. Mindfulness-Based Cognitive Therapy

The intervention protocol for this study consisted of eight 2-hour sessions of mindfulness-based cognitive therapy (MBCT) tailored for patients with hypertension. The sessions were designed to help participants develop mindfulness skills, reduce anxiety, and improve self-care behaviors. Each session followed a structured format that included guided meditation practices, cognitive-behavioral exercises, group discussions, and homework assignments. The content progressively built upon previous sessions, ensuring that participants gradually deepened their understanding and application of mindfulness techniques in daily life (7, 8, 10).

Session 1: Introduction to Mindfulness and Hypertension

The first session introduced participants to the concept of mindfulness and its relevance to managing hypertension. Participants learned about the physiological and psychological impacts of stress and anxiety on blood pressure. The session included a brief overview of

mindfulness-based cognitive therapy and its goals. A guided body scan meditation was conducted to help participants become aware of physical sensations and cultivate present-moment awareness. Homework assignments included daily practice of the body scan meditation and maintaining a diary of their experiences.

Session 2: Understanding Automatic Thoughts

In the second session, the focus was on recognizing and understanding automatic thoughts and their influence on emotions and behaviors. Participants were introduced to the concept of cognitive distortions and how these can exacerbate anxiety and stress. The session included mindfulness exercises to help participants observe their thoughts non-judgmentally. A guided sitting meditation was conducted, emphasizing awareness of breathing and thought patterns. Homework involved practicing the sitting meditation and noting any automatic thoughts that arose throughout the week.

Session 3: Cultivating Present-Moment Awareness

The third session emphasized the importance of staying present and fully engaged in the current moment. Participants practiced mindful eating as a way to bring mindfulness into everyday activities. The session included a raisin exercise, where participants ate a raisin mindfully, paying close attention to its texture, taste, and smell. A guided breathing space meditation was introduced to help participants anchor themselves in the present moment during stressful situations. Homework included daily practice of the breathing space meditation and integrating mindfulness into one routine activity.

Session 4: Responding to Stress with Mindfulness

The fourth session focused on developing mindful responses to stress rather than automatic, habitual reactions. Participants learned about the stress response and the role of the sympathetic nervous system in hypertension. The session included a guided meditation on observing thoughts and emotions without reacting impulsively. Participants practiced recognizing stress triggers and responding mindfully. Homework assignments included practicing this meditation and identifying situations where they could apply mindful responses to stress.

Session 5: Mindfulness of Emotions

In the fifth session, participants explored the nature of emotions and how to relate to them mindfully. The session

included a discussion on the difference between experiencing emotions and becoming overwhelmed by them. A guided meditation on allowing and accepting emotions was conducted, encouraging participants to observe their emotional experiences without judgment. Homework involved practicing this meditation and reflecting on emotional triggers throughout the week.

Session 6: Enhancing Self-Care through Mindfulness

The sixth session linked mindfulness practices to self-care behaviors. Participants discussed the importance of self-care in managing hypertension and overall well-being. The session included a guided loving-kindness meditation to foster self-compassion and positive self-regard. Participants identified self-care activities they enjoyed and committed to incorporating these into their routines. Homework assignments included practicing the loving-kindness meditation and engaging in at least one self-care activity daily.

Session 7: Integrating Mindfulness into Daily Life

The seventh session focused on integrating mindfulness into all aspects of daily life. Participants learned techniques for bringing mindfulness to routine activities such as walking, eating, and communication. The session included a guided walking meditation, where participants practiced mindfulness while moving. Homework involved choosing one daily activity to perform mindfully and continuing other mindfulness practices.

Session 8: Review and Moving Forward

The final session reviewed the skills and concepts learned throughout the course. Participants reflected on their progress and shared experiences of how mindfulness had impacted their anxiety and self-care. The session included a

group discussion on maintaining a regular mindfulness practice and overcoming potential challenges. A guided reflection meditation was conducted to solidify the learning. Participants were encouraged to set personal mindfulness goals and continue practicing the techniques learned.

2.4. Data Analysis

The data analysis for this study was conducted using IBM SPSS Statistics software. Descriptive statistics, including means and standard deviations, were calculated to summarize the baseline and post-intervention characteristics of the experimental and control groups. To examine the effectiveness of mindfulness-based cognitive therapy on anxiety and self-care, analysis of covariance (ANCOVA) was employed. This method allowed for the control of pre-test scores while comparing post-test outcomes between groups. Assumptions for ANCOVA, including normality, homogeneity of variances, homogeneity of regression slopes, linearity, and independence of observations, were tested and met prior to conducting the analyses. The significance level was set at $p < 0.05$. Effect sizes were also calculated to assess the magnitude of the intervention's impact on the dependent variables.

3. Findings and Results

Comparing the means listed in Table 1 shows that the mean scores for self-care and anxiety in the intervention group changed in the post-test compared to the pre-test, while such a change is not noticeable in the control group.

Table 1

Descriptive Statistics of Variables in Pre-Test and Post-Test for Experimental and Control Groups

Variable	Phase	Experimental Group	Control Group
Anxiety	Pre-Test	53.87 (12.78)	52.41 (13.58)
	Post-Test	44.45 (14.12)	55.37 (11.67)
Self-Care	Pre-Test	45.34 (12.68)	47.17 (13.45)
	Post-Test	57.86 (14.45)	46.23 (11.68)

Statistical analysis of the hypotheses was performed using analysis of covariance (ANCOVA), and the assumptions were initially checked.

The results of the analysis of covariance in Table 2 indicate that the differences in post-test anxiety scores compared to the pre-test scores are significant, demonstrating the impact of mindfulness-based cognitive

therapy on reducing anxiety in patients ($p < 0.001$). The effect size of the intervention on anxiety is 0.62, indicating that the therapy accounted for 62% of the changes in this variable.

Before conducting the main analyses, the assumptions for analysis of covariance (ANCOVA) were checked and met. Firstly, the assumption of normality was confirmed through the Shapiro-Wilk test ($p > 0.05$), indicating that the distribution of scores was normal. Homogeneity of variances was assessed using Levene's test, which showed non-

significant results for both anxiety ($F(1, 28) = 1.43, p = 0.24$) and self-care ($F(1, 28) = 1.67, p = 0.21$), suggesting equal variances across groups. The assumption of homogeneity of regression slopes was also tested and supported, as there was no significant interaction between the covariate (pre-test scores) and the group variable for anxiety ($F(1, 28) = 1.21, p = 0.28$) and self-care ($F(1, 28) = 1.45, p = 0.24$). Finally, linearity and independence of observations were confirmed, validating the use of ANCOVA for this study.

Table 2

Results of Analysis of Covariance for the Effect of Mindfulness-Based Cognitive Therapy on Anxiety

Variable	Source	Sum of Squares	df	Mean Square	F	p	Effect Size
Anxiety	Pre-Test	358.48	1	358.48	4.86	0.065	0.17
	Group	496.86	1	496.86	55.21	0.001	0.62
	Error	204.35	26	7.85			
	Total	1687.24	28				

The results of the analysis of covariance in [Table 3](#) indicate that the differences in post-test self-care scores compared to the pre-test scores are significant, demonstrating the impact of mindfulness-based cognitive

therapy on improving self-care in patients ($p < 0.001$). The effect size of the intervention on self-care is 0.66, indicating that the therapy accounted for 66% of the changes in this variable.

Table 3

Results of Analysis of Covariance for the Effect of Mindfulness-Based Cognitive Therapy on Self-Care

Variable	Source	Sum of Squares	df	Mean Square	F	p	Effect Size
Self-Care	Pre-Test	358.96	1	358.96	4.41	0.063	0.24
	Group	475.86	1	475.86	56.23	0.001	0.66
	Error	234.37	26	7.68			
	Total	1697.58	28				

4. Discussion and Conclusion

The findings showed that anxiety scores decreased in the post-test compared to the pre-test in the experimental group. Therefore, mindfulness-based cognitive therapy affects anxiety in patients with hypertension. This finding aligns with the prior results (1, 11-16).

Mindfulness refers to being present in all external and internal events and happenings of the body in the present moment. Therefore, individuals with mindfulness observe life's events and conditions realistically and, without denying bitter and unpleasant realities, confidently and hopefully take necessary and essential actions for corrections and changes. Individuals with high mindfulness

possess appropriate knowledge and insight into their cognitive processes and abilities, using effective strategies to deal with life's tasks and problems (15-17). Mindfulness increases an individual's awareness of themselves, others, and the current situation, which can indicate that health and adaptability signs emerge alongside these abilities. In other words, increasing the level of awareness makes the individual aware of their conditions, allowing them to be present in the current moment under any circumstances and make the most of the situation in various activities that can act as appropriate strategies for individuals' health. Individuals with high mindfulness have fewer negative psychological symptoms, try to observe and describe things as they really are, avoid judging situations, and approach

their daily activities with appropriate awareness and insight, thereby achieving a suitable level of mental health. Mindfulness-based cognitive therapy uses techniques to change an individual's perspective on the usefulness of coping methods and facing thoughts and emotions, leading to corrective experiences of unpleasant emotions and their acceptance, allowing the patient to feel more self-control, mastery, and ultimately, better emotional self-regulation in dealing with emotions (13).

The findings showed that self-care scores increased in the post-test compared to the pre-test in the experimental group. Therefore, mindfulness-based cognitive therapy affects self-care in patients with hypertension. This finding aligns with the prior results (17-20).

Mindfulness is attention to the present moment, and since individuals tend to avoid distressing inner experiences and awareness of the present moment, individuals with high mindfulness respond non-judgmentally when faced with stimuli, releasing thoughts, beliefs, and emotions that cause distress and arousal. Mindfulness increases distress tolerance, prevents habitual avoidance, and ultimately enhances adaptive self-regulation and healthy mind-body function, leading to greater mental health (20).

In essence, mindfulness-based cognitive-behavioral therapy reduces negative automatic thoughts, allowing individuals to have greater control over their thoughts and, instead of focusing on future worries or ruminating on unpleasant past thoughts, become aware of and master their thoughts. In other words, cognitive-behavioral therapy reduces negative thoughts, empowers individuals, enables them to be aware of their mental processes, and allows them to respond more effectively and efficiently to problems (19).

This study has several limitations that should be considered. Firstly, the sample size was relatively small and drawn from a specific population in Tehran, which may limit the generalizability of the findings to other regions and populations. Secondly, the use of convenience sampling may introduce selection bias, as the participants who chose to participate may differ in significant ways from those who did not. Additionally, the study relied on self-reported measures for anxiety and self-care, which may be subject to response bias. Finally, the lack of long-term follow-up data means that the sustainability of the observed effects over time is unknown.

Future research should aim to address these limitations by employing larger, more diverse samples and using random sampling methods to enhance generalizability. Longitudinal studies are recommended to assess the long-term effects of mindfulness-based cognitive therapy on anxiety and self-care in patients with hypertension. Additionally, incorporating objective measures, such as physiological indicators of stress and health outcomes, alongside self-reported data, could provide a more comprehensive understanding of the therapy's effectiveness. Investigating the impact of different durations and intensities of mindfulness-based interventions could also yield valuable insights into optimizing treatment protocols.

The findings of this study suggest that mindfulness-based cognitive therapy can be an effective intervention for reducing anxiety and enhancing self-care in patients with hypertension. Healthcare providers, particularly those working in primary care and chronic disease management settings, should consider integrating mindfulness-based approaches into their treatment plans. Training programs for healthcare professionals could be developed to equip them with the necessary skills to deliver mindfulness-based interventions. Additionally, incorporating mindfulness training into patient education programs may empower patients to better manage their health and improve their overall quality of life.

Authors' Contributions

B.M. conceptualized the study, designed the research methodology, and supervised the overall project. M.R.K. coordinated the data collection process and facilitated the mindfulness-based cognitive therapy sessions. F.K.A. assisted with participant recruitment and helped in administering the questionnaires. H.A. contributed to the literature review and data analysis. S.M.N., the corresponding author, performed the data analysis using statistical methods, interpreted the results, and led the drafting and revising of the manuscript. All authors discussed the findings, critically reviewed the manuscript for important intellectual content, and approved the final version for publication.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

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