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The Effectiveness of Mindfulness-Based Therapy on Psychological Well-Being and Resilience in Coronary Heart Disease Patients with Hypertension Visiting Shahid Rajaei Hospital

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A B S T R A C T

The present study aimed to investigate the effectiveness of mindfulness-based therapy on psychological well-being and resilience in coronary heart disease (CHD) patients with hypertension visiting Shahid Rajaei Hospital. This study employed a quasi-experimental design with a pretest, posttest, and 3-month follow-up, including a control group. The statistical population of this research consisted of all individuals with coronary heart disease and hypertension. The research sample included 30 of these patients, selected using purposive sampling and randomly assigned to either the experimental or control group. To collect data, the Ryff Psychological Well-Being Scale (1989) and the Bond Resilience Scale (2011) were used. The mindfulness-based therapy intervention was conducted over eight 90-minute weekly sessions, while the control group did not receive any intervention. Data analysis was performed using repeated measures analysis of variance with SPSS-26 software. The findings indicated that mindfulness-based therapy is effective in improving the psychological well-being and resilience of coronary heart disease patients with hypertension ($p < .05$). It is concluded that mindfulness-based therapy enhances the psychological well-being and resilience of coronary heart disease patients with hypertension. Therefore, this approach can be employed alongside medical interventions in healthcare settings for these patients.

Keywords: *Resilience, Psychological Well-Being, Coronary Heart Disease Patients, Mindfulness-Based Therapy.*

1. Introduction

In recent years, chronic diseases have been the most common causes of mortality worldwide, and these diseases impair individuals' ability to maintain normal functioning (Jamil et al., 2024). Cardiovascular diseases are among the largest health concerns and the leading causes of mortality and disability (He et al., 2024), with a prevalence rate of 3,500 cases per 100,000 people in Iran (Heidari Sabet et al., 2020). Cardiovascular diseases increase blood pressure (Scharbert et al., 2024) and are the most significant cause of death and the primary reason for hospital admissions worldwide, as they account for one-third of global deaths (Rubino et al., 2024). Coronary heart disease, a primary consequence of cardiovascular conditions, affects patients' physical, psychological, social, and economic well-being (Xie et al., 2024).

Today, psychological well-being has received increasing attention in medical research (Gulati et al., 2023). In patients with heart failure, adequate psychological well-being enhances heart-related health outcomes (Trajković et al., 2023). Psychological well-being refers to the absence of negative emotions, life satisfaction, and a set of phenomena encompassing individuals' emotional responses, domains of satisfaction, and overall life evaluations (Hepat et al., 2023). Ryff defines psychological well-being as a multidimensional construct comprising six domains of positive functioning. According to Ryff, psychological functioning should be assessed in terms of self-acceptance, personal growth, life purpose, positive relationships with others, environmental mastery, and autonomy (Cole et al., 2024). Research findings indicate that individuals with higher psychological well-being exhibit numerous positive traits, including greater engagement in meaningful activities, self-efficacy, an optimistic explanatory style, daily positive emotions, deep interpersonal relationships, life satisfaction, openness to experiences, positive affect, autonomy, and extroversion (Guo et al., 2023). Additionally, there is substantial evidence suggesting that adverse life events, such as heart disease, can negatively impact psychological well-being (Jyotsna et al., 2023). Heart disease patients experience significant psychological stress and pressure due to their condition, putting their mental well-being at risk (Fan et al., 2023).

Another relevant psychological variable that acts as a protective factor against psychological pressures and stress is resilience (Naseri Gorgoon et al., 2021). Resilience refers to individuals' openness to internal and external experiences (Pinna & Edwards, 2020). This trait varies across individuals and determines their responses to new experiences. Resilience emphasizes the capacity to connect with the present moment and the ability to differentiate the self from thoughts and internal psychological experiences (Wielgus et al., 2020). Resilient individuals are curious about the external and internal world and live rich lives in terms of experiences. They embrace and even seek out new experiences rather than avoiding them (Landi et al., 2021). Resilience encompasses a wide range of human abilities, from recognizing and adapting to various environmental demands to altering behavioral strategies when those strategies threaten one's individual and social functioning (Edwards & Lowe, 2021). Resilience helps maintain balance across different areas of life and keeps individuals aware of their surroundings and committed to behaviors that align with their personal values. While psychological resilience is associated with mental health, its absence is linked to psychological harm (Frinking et al., 2020). Studies by Ben-Ari et al. (2021), Arslan and Allen (2022), and Davis et al. (2020) indicate that resilience is related to general health and vulnerability across a spectrum of distress, including depression, anxiety, and general psychological discomfort (Arslan & Allen, 2022; Ben-Ari et al., 2021; Davis et al., 2020).

One intervention that appears effective in improving psychological factors in heart disease patients is mindfulness-based therapy. This therapy introduces individuals to metacognition and teaches them new behavioral strategies to focus attention, avoid rumination, and reduce worry-driven responses (Derafshi, 2018). Mindfulness can bring about positive changes in happiness and well-being through the integration of vitality and clarity of experiences. Mindfulness-based therapy has been associated with reduced psychological distress (Ghielen et al., 2019) and symptoms of anxiety and depression (Buckner et al., 2020), as well as improved psychological, physical, emotional, and spiritual well-being (Flugel et al., 2010) and reduced physical symptoms (Greeson et al., 2018).

Given the aforementioned considerations, the present study aimed to examine the effectiveness of mindfulness-based therapy on psychological well-being and resilience in coronary heart disease patients with hypertension visiting Shahid Rajaei Hospital.

KMAN-CPN
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2. Methods and Materials

2.1. Study Design and Participants

The present research employed an experimental design using a quasi-experimental method with a pretest-posttest control group and a 3-month follow-up. The research population included all individuals with coronary heart disease and hypertension registered at Shahid Rajaei Hospital in Tehran from 2022 until the end of 2023. The sampling method in this study was purposive sampling. From among several patients, 30 individuals (15 per group) were selected based on inclusion criteria and a pretest session that involved a clinical interview conducted by the researcher under the supervision of a psychiatrist, using DSM-5 diagnostic criteria. Those who obtained the highest baseline scores after completing the questionnaires were randomly assigned to two groups: an intervention group (15 participants) and a control group (15 participants). Inclusion criteria included having coronary heart disease, such as stable angina, unstable angina, or myocardial infarction; more than 70% blockage in at least one coronary artery as determined by angiography; at least 6 months since the acute inflammatory phase of the disease or intervention; age between 35 and 60 years; education level above the fifth grade of primary school; and patient consent to participate in the study. Exclusion criteria included having inflammatory or autoimmune diseases, serious psychiatric disorders, or taking immunological or psychiatric medications, as well as unwillingness to participate in the study. The experimental group underwent mindfulness-based therapy, which was administered once a week for 90 minutes. No specific intervention was provided to the control group; however, to adhere to ethical principles, they were later offered acceptance and commitment therapy and mindfulness-based therapy.

2.2. Measures

2.2.1. Psychological Well-Being

This scale was developed by Ryff in 1989. The original version consists of 120 items, and a shorter version with 18 items was later proposed. The scale uses a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with a minimum score of 18 and a maximum score of 108. It includes six components: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Each component consists of 3 items, with a total score calculated for the scale. Items 3, 4, 5, 9, 10, 13, 16, and 17 are reverse scored. Confirmatory factor analysis indicated satisfactory validity at .77. In Iran, Bayani et al. (2008) reported a correlation coefficient of .47 between the psychological well-being scale and the life satisfaction questionnaire. The correlation with the original form was reported as high as .89. In Iran, Parchami-Khoram et al. (2022) reported a Cronbach's alpha reliability coefficient of .68 for the overall scale (Mohammadi Niko & Temanaei Far, 2024). The Cronbach's alpha in the present study was .876.

2.2.2. Resilience

This questionnaire was developed by Bond et al. (2011) to measure experiential/psychological inflexibility, especially in relation to experiential avoidance and engagement in action despite unwanted thoughts and feelings. It contains 7 items assessing unwillingness to experience unwanted thoughts and feelings (e.g., "I am afraid of my feelings") and the inability to be present in the moment and act in accordance with inner values (e.g., "My painful memories prevent me from having a satisfying life"). Items are rated on a 7-point Likert scale, ranging from 1 (never) to 7 (always). Higher scores indicate lower psychological flexibility and higher experiential avoidance. The test-retest reliability was reported as .81, and internal consistency as .84 by Bond et al. (2011) (Fakhrabadi, 2023). The Cronbach's alpha for this study was .744.

2.3. Intervention

2.3.1. Mindfulness-Based Therapy

Mindfulness-based therapy was conducted over eight 90-minute weekly sessions, following the mindfulness-based cognitive therapy manual by Segal et al. (2013) (Afshar Shandiz, 2023; Bagheri, 2021; Buckner et al., 2020; Naseri Gorgoon et al., 2021).

Session 1: The session began with introductions and an overview of the program. Participants were introduced to the diagnosis and symptoms of depression and the components of the research. A brief description of the eight sessions of mindfulness-based therapy was provided. Participants engaged in a mindful eating exercise with a single raisin, followed by a 30-minute body scan meditation, and a discussion about their experiences and feelings. The homework assignment involved applying mindful awareness

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learned from the raisin exercise to activities like brushing teeth or washing dishes.

Session 2: The session included a body scan meditation, followed by a discussion of participants' experiences and homework. Obstacles to practicing mindfulness were explored, and strategies to overcome these barriers were presented. Participants discussed the differences between thoughts and feelings and then engaged in a sitting meditation. Homework assignments included practicing mindfulness of a pleasant event, sitting meditation, body scan, and mindful awareness of a daily activity.

Session 3: The session involved a non-judgmental seeing and hearing exercise, where participants observed and listened for 2 minutes. A sitting meditation focused on breathing and bodily sensations was conducted. Participants discussed their homework experiences and practiced a 3-minute breathing space meditation, which involved three steps: awareness, focusing on the breath, and expanding attention to the body. The session also included a mindful movement exercise. Homework included sitting meditation, body scan, the 3-minute breathing space, mindfulness of a new daily activity, and mindfulness of an unpleasant event.

Session 4: Participants practiced a four-dimensional sitting meditation, focusing on breathing, sounds, bodily sensations, and thoughts. The session covered stress responses and alternative attitudes and behaviors to manage difficult situations. A mindful walking exercise was introduced. Homework included a sitting meditation, body scan or mindful movement, and practicing the 3-minute breathing space in response to unpleasant events, along with mindfulness of a new daily activity.

Session 5: Participants engaged in a 3-minute breathing space exercise and discussed homework in pairs. A new exercise called "Mood, Thoughts, and Separate Perspectives" was introduced, emphasizing that thoughts are often not factual. Four meditation exercises were conducted over seven continuous hours. Homework involved selecting a personalized combination of meditations, practicing the 3-minute breathing space in response to unpleasant events, and mindfulness of a new daily activity.

Session 6: The session included a four-dimensional meditation, focusing on awareness of whatever arises in the moment. The theme was self-care, with participants reflecting on what events in their lives were pleasant or unpleasant and planning for enough positive experiences. The 3-minute breathing space exercise was practiced, and homework involved a combination of meditations, the 3-minute breathing space in unpleasant events, and mindfulness of a new daily activity.

Session 7: The session reviewed previous homework, revisited earlier concepts, and explored how participants could apply what they had learned. A 3-minute breathing space meditation was practiced. Participants discussed barriers to continuing meditation and evaluated whether they had met their expectations, experienced personal growth, improved coping skills, or wanted to continue practicing mindfulness.

Session 8: The final session prepared participants for the conclusion of therapy. A summary of all sessions was provided, along with additional tips. Participants completed a posttest, and the session ended with reflections on the journey through the therapy.

2.4. Data analysis

Data were analyzed using SPSS version 26 and analysis of variance methods.

3. Findings and Results

The mean ± standard deviation of age for the acceptance and commitment therapy group was 49.2 ± 6.35, for the mindfulness-based therapy group it was 50.4 ± 7.01, and for the control group it was 48.7 ± 5.89. Regarding gender distribution, the acceptance and commitment therapy group included 8 men (53%) and 7 women (47%). The mindfulness-based therapy group had 5 men (33%) and 10 women (66%), while the control group consisted of 6 men (40%) and 9 women (60%). Statistical tests indicated no significant differences among groups concerning demographic variables.

Table 1

Means and Standard Deviations of Research Variables Across Three Time Points: Pretest, Posttest, and Follow-Up

Variable	Group	Pretest M	Pretest SD	Posttest M	Posttest SD	Follow-Up M	Follow-Up SD
Psychological Well-Being	Mindfulness-Based Therapy	36.9	4.25	41.06	4.84	41.1	4.83
	Control	37.3	5.13	37.6	4.82	37.4	4.71
Resilience	Mindfulness-Based Therapy	16.3	3.47	5.5	1.85	5.66	2.02
	Control	16.4	2.82	15.5	3.09	15.8	3.27

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The Shapiro-Wilk test confirmed the normality of the distribution of the variables, as the results were not significant, indicating that the dependent variables were normally distributed. Mauchly's test for the sphericity assumption was not confirmed; therefore, the Greenhouse-Geisser correction was used for repeated measures ANOVA. Levene's test showed no significant error variance for psychological well-being (F = 0.449, p = 0.508) and resilience (F = 0.879, p = 0.356) at the 0.05 level.

Table 2

Significance Results of Multivariate Analysis of Variance (MANOVA) for the Research Groups

Variable	Test Name	Value	F	df1	df2	p-value	Partial Eta Squared
Psychological Well-Being	Pillai's Trace	0.765	43.9	2	27	0.001	0.765
	Wilks' Lambda	0.235	43.9	2	27	0.001	0.765
	Hotelling's Trace	3.25	43.9	2	27	0.001	0.765
	Roy's Largest Root	3.25	43.9	2	27	0.001	0.765
Resilience	Pillai's Trace	0.849	75.9	2	27	0.001	0.849
	Wilks' Lambda	0.151	75.9	2	27	0.001	0.849
	Hotelling's Trace	5.62	75.9	2	27	0.001	0.849
	Roy's Largest Root	5.62	75.9	2	27	0.001	0.849

As shown in Table 2, Wilks' Lambda was significant at the 0.01 level, indicating significant differences between the experimental and control groups for the variables studied. The partial eta squared for psychological well-being was 0.76, indicating that 76% of the variance in psychological well-being was accounted for by the intervention. For resilience, the partial eta squared was 0.84, indicating that 84% of the variance was related to the intervention.

Table 3

Summary of ANOVA for Within-Group and Between-Group Effects

Variable	Source of Variance	Sum of Squares	df	Mean Square	F	p-value	Effect Size
Psychological Well-Being	Between Subjects	Group	6333.6	1	6333.6	88.8	0.001
	Error	1995.9	28	71.2			
	Within Subjects	Factor	95.3	1.10	86.06	103.3	0.001
	Factor × Group	78.8	1.10	71.1	85.4	0.001	0.753
	Error (Factor)	25.8	31.02	0.832			
Resilience	Between Subjects	Group	1088.5	1	1088.5	55.09	0.001
	Error	553.2	28	19.7			
	Within Subjects	Factor	696.02	1.15	348.01	167.1	0.001
	Factor × Group	524.02	1.15	452.8	125.8	0.001	0.818
	Error (Factor)	116.6	32.3	3.60			

The repeated measures ANOVA using Greenhouse-Geisser correction showed a significant main effect for psychological well-being (F = 103.3, p = 0.001, Greenhouse-Geisser = 95.3) and resilience (F = 167.1, p = 0.001, Greenhouse-Geisser = 696.02) at the 0.01 level. There was also a significant interaction effect between group and factor (measurement stages) for psychological well-being (F = 85.4, p = 0.001, Greenhouse-Geisser = 78.8) and resilience (F = 125.8, p = 0.001, Greenhouse-Geisser = 524.02). This indicates significant differences in at least two stages of psychological well-being and resilience between the intervention and control groups. To determine which measurement stages these differences pertain to, pairwise comparisons were conducted, as shown in Table 4.

Table 4

Pairwise Comparisons for Repeated Measures ANOVA of Self-Efficacy

Variable	Source of Variance	Pairwise Comparisons	Sum of Squares	df	Mean Square	F	p-value	Effect Size
Psychological Well-Being	Factor	Pretest vs. Posttest	70.4	1	70.4	103.4	0.001	0.787
		Posttest vs. Follow-Up	24.9	1	24.9	103.3	0.001	0.787
	Factor × Group	Pretest vs. Posttest	62.01	1	62.01	91.07	0.001	0.765
		Posttest vs. Follow-Up	16.8	1	16.8	69.6	0.001	0.713
	Error	Pretest vs. Posttest	19.06	28	0.681			
		Posttest vs. Follow-Up	6.75	28	0.241			
Resilience	Factor	Pretest vs. Posttest	476.01	1	476.01	147.3	0.001	0.840
		Posttest vs. Follow-Up	220.006	1	220.006	235.5	0.001	0.894
	Factor × Group	Pretest vs. Posttest	380.01	1	380.01	117.6	0.001	0.808
		Posttest vs. Follow-Up	144.006	1	144.006	154.1	0.001	0.846
	Error	Pretest vs. Posttest	90.4	28	3.23			
		Posttest vs. Follow-Up	26.1	28	0.934			

According to the results, the main effect of the factor between pretest and posttest for psychological well-being (F = 103.4, p = 0.001) and resilience (F = 147.3, p = 0.001) was significant. The interaction effect between factor and group was also significant for psychological well-being (F = 91.07, p = 0.001) and resilience (F = 117.6, p = 0.001). The mean scores in Table 1 show that psychological well-being and resilience increased in the intervention group compared to the control group from pretest to posttest, indicating the effectiveness of mindfulness-based therapy. Table 4 also shows that the effects at posttest and follow-up were significant at the 0.01 level, meaning that the differences between posttest and follow-up scores were significant for both groups, confirming the sustained effect of mindfulness-based therapy on psychological well-being and resilience in coronary heart disease patients with hypertension.

4. Discussion and Conclusion

The results of the study indicated that mindfulness-based therapy is effective in enhancing psychological well-being and resilience in coronary heart disease patients with hypertension. These findings are consistent with the research prior (Afshar Shandiz, 2023; Bagheri, 2021; Buckner et al., 2020; Derafshi, 2018; Fakhrabadi, 2023; Flugel et al., 2010; Frostadottir & Dorjee, 2019; Ghielen et al., 2019; Greeson et al., 2018; Huynh & Torquati, 2019; Kang & Luo, 2022; Mahdizadeh, 2023; Mittal et al., 2022; Mohammadi Niko & Temanaei Far, 2024; Naseri Gorgoon et al., 2021; Partovi Valami, 2021; Sabetfar et al., 2021; Wielgus et al., 2020).

To explain the effectiveness of mindfulness-based therapy on psychological well-being, it can be said that mindfulness is fundamentally described as a quality of awareness rooted in attentive consciousness. Mindfulness-based cognitive therapy refers to therapeutic approaches that use behavioral techniques and procedures for modifying maladaptive beliefs. The primary goal of mindfulness-based cognitive therapy is to enable individuals to be aware of the effects of reactivated depressive thinking patterns through spontaneous monitoring and to maintain a mindful presence. This is achieved through intentional attention to a neutral object (such as the flow of breath) and observing thoughts, emotions, or bodily sensations. Mindfulness allows individuals to perceive internal and external realities freely and without distortion, providing the ability to face a wide range of thoughts, emotions, and experiences, whether pleasant or unpleasant (Frostadottir & Dorjee, 2019). Mindfulness-based cognitive behavioral therapy helps individuals identify and modify their thoughts. Training in resilience focuses on attention, mental enrichment, stopping rumination, correcting false beliefs (both positive and negative), and challenging negative beliefs related to emotions, thereby reducing self-inconsistencies. This therapeutic approach emphasizes the present moment, encouraging individuals to focus less on negative thoughts and, as a result, reduce anxiety (Kang & Luo, 2022).

The mind frequently interprets events, leading to persistent reactions and emotions. It tends to gravitate toward distressing and negative thoughts, perpetuating automatic negative thinking and lowering self-esteem. Mindfulness practice encourages individuals to engage non-judgmentally with experiences, resulting in more precise autobiographical memory encoding, which enhances the ability to recall information specifically. This approach aids in non-judgmental emotion regulation and the acceptance of emotions and physical phenomena as they occur

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(Mohammadi Niko & Temanaei Far, 2024; Naseri Gorgoon et al., 2021).

In explaining the effectiveness of mindfulness-based therapy on resilience, it is noted that mindfulness involves paying attention to internal states (such as emotions and cognition) in a non-judgmental and accepting manner. Mindfulness training helps individuals reduce habitual and automatic responses to stressful experiences, ultimately broadening their perspective and insight. This allows individuals to accept unchangeable life events, reducing stress responses. Mindfulness exercises increase self-awareness and physical and cognitive mindfulness, breaking maladaptive patterns of thoughts and emotions, promoting present-moment living, and facilitating new cognitive processes like decision-making and planning, leading to positive mental states and physical and emotional relaxation (Bagheri, 2021).

Another important aspect of mindfulness-based therapy is that individuals learn to manage negative emotions and thoughts and experience mental events positively. Mindfulness training emphasizes deep breathing and thoughtful reflection, teaching people to be present and face unpleasant emotions and thoughts without avoidance, resulting in cognitive changes and psychological symptom improvement (Partovi Valami, 2021).

Every study has its limitations. In this study, data collection was conducted using self-report questionnaires, relying on participants' honesty and self-assessment, which may be prone to distractions, inaccuracy, judgment errors, and misinterpretation of instructions, affecting the results. The study's experimental nature and small sample size limited the ability to control extraneous variables, restricting the generalizability of findings to larger populations. Additionally, uncontrollable factors between pretest, posttest, and follow-up may have influenced the results. To strengthen and better interpret the findings, further studies are recommended in other settings, such as different nursing homes, to allow for comparisons and improve generalizability.

Given that this research was conducted on coronary heart disease patients with hypertension, it is suggested that future studies examine the effects of these interventions on other groups with chronic pain and specific illnesses and across different age groups. It is also recommended to investigate the differential effects of these interventions across genders. Future studies should test larger groups to enhance the reliability of therapeutic interventions. Additionally, future research should compare the effects of various therapeutic methods and investigate the long-term sustainability of treatment effects in extended follow-up periods.

Authors' Contributions

Authors contributed equally to this article.

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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Ethical Considerations

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

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