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Effectiveness of Mindfulness-Based Therapy on Dark Personality Traits and Experiential Avoidance in Individuals with Cardiovascular Diseases

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A B S T R A C T

The present study aimed to examine the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on reducing dark personality traits and experiential avoidance in individuals with cardiovascular diseases. The research method was a quasi-experimental design with a pre-test-post-test and a control group. The sample included 30 individuals with cardiovascular diseases who were conveniently selected from medical centers in Tehran and randomly assigned to experimental and control groups (15 participants each). The experimental group underwent 8 weekly 90-minute sessions of mindfulness-based interventions, while the control group received no intervention. Data were collected using the Dark Personality Traits Questionnaire and the Bond et al. (2007) Experiential Avoidance Questionnaire, and hypotheses were tested using analysis of covariance. The study examined the effects of an 8-week mindfulness program on 30 patients with cardiovascular diseases. The results indicated that the reduction of dark personality traits and experiential avoidance was effective in individuals with cardiovascular diseases. Based on the findings, it can be concluded that MBCT was effective in reducing dark personality traits and experiential avoidance in individuals with cardiovascular diseases.

Keywords: *Mindfulness, Dark Personality Traits, Experiential Avoidance, Cardiovascular Diseases.*

1. Introduction

Cardiovascular diseases are considered common and major illnesses that, in addition to physical effects, significantly influence the psychology and behavior of those affected (1). Cardiovascular disease is the most common type of illness (2), representing a fundamental problem for a significant portion of the global population, to the extent that it has become the leading complaint among patients (3). Another type of chronic illness, cancer, is recognized as the second leading cause of death in the United States and the third in Iran, following cardiovascular diseases (4).

Individual differences such as personality play a crucial role in moderating the relationship between environmental events, the immune system, and the progression of cancer (5). In the field of cardiovascular disease, personality has been a significant research topic in recent years (6). Studies have also shown that personality factors can cause cardiac symptoms by influencing indirect risk factors for heart problems (7). A systematic review among patients with cardiovascular diseases, non-cardiac patients, and healthy individuals also indicates that personality is a predictor of health outcomes (8).

One factor that appears to be present among individuals with cardiovascular diseases is dark personality traits (9). Dark personality traits include a range of characteristics that are clinically significant, comprising traits like Machiavellianism, narcissism, and antisocial behavior (10). These traits are grouped together conceptually because they share dimensions such as socially undesirable nature, duplicity, lack of empathy, aggression, self-centeredness, and deceitfulness (11). The narcissistic trait, differing from Machiavellianism and antisocial behavior, which are negative, is considered part of the 'bright' side of personality (12). In this regard, it has been established that individuals with Machiavellian and antisocial traits lead more stressful and anxious lives, whereas those with higher levels of narcissism are more satisfied with their lives and more optimistic about the future (13). Indeed, Machiavellians are individuals who are money-loving, ambitious, competitive, and self-serving, only caring about their desires and disregarding the rights of others (14). The antisocial trait includes a set of negative and norm-breaking characteristics, among the most significant of which are aggression, lack of remorse, selfish behaviors, psychological distress, and harm to others (10, 14). Individuals displaying antisocial behaviors seek power and violence and exert all their efforts to harm others (15). In contrast, individuals with the narcissistic trait possess high self-esteem, a sense of pride, and self-centeredness, always wanting to be the center of attention and often seeking admiration for their physical and psychological attributes from those around them (16).

Another psychological variable that seems to affect cardiovascular disease is experiential avoidance. Experiential avoidance predicts a wide range of mental health problems and acts as a vulnerability factor for cardiovascular disease, leading to increased negative affect and reduced positive affect (17). Experiential avoidance refers to efforts to avoid or prevent the occurrence of personal events or situational sensitivities (18). Essentially, the function of experiential avoidance is to control or minimize the impact of distressing experiences and can provide immediate and short-term relief; daily stresses encountered by patients and problems stemming from their illness can lead to various psychological issues, including experiential avoidance (19). Experiential avoidance is a process that involves negative evaluations of unwanted personal senses, feelings, and thoughts, and the reluctance to experience these private events, with deliberate efforts to control or escape them (20). Patients use experiential avoidance to avoid painful experiences. This construct has two components: reluctance to engage with personal experiences (bodily sensitivities, emotions, thoughts, memories, and behavioral contexts) and efforts to avoid painful experiences or events that might trigger them (21). Based on the results obtained, experiential avoidance is a strong predictor of psychological symptoms and signs (22). This factor can play a significant role in the development and persistence of psychological disorders. Studies have shown that high experiential avoidance is associated with psychological disturbances, including anxiety (22).

In recent years, attention to psychological therapies, particularly mindfulness-based therapies, as an effective approach in reducing symptoms and improving the quality of life of patients, has increased. Given recent advancements in the field of health psychology and various treatments for chronic diseases, new approaches for improving patients' quality of life have been introduced (23). Among these, mindfulness-based therapy has gained attention as an effective approach in managing and reducing symptoms of various diseases, including cardiovascular diseases (19). Mindfulness-based therapy is a psychotherapeutic approach rooted in ancient meditation traditions, focusing on increasing awareness and acceptance of momentary experiences without judgment. This approach can help individuals constructively deal with the psychological symptoms resulting from cardiovascular diseases (24). Mindfulness helps patients have a greater awareness of bodily relaxations, tensions, and other physical sensations. This awareness can assist them in recognizing early signs of

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stress or anxiety and dealing with them more effectively before they become more severe problems (25). Mindfulness therapy, by reducing stress responses in the body, can help reduce stress and anxiety levels. Breathing exercises and meditation, which are part of mindfulness-based therapy, increase the activity of the parasympathetic nervous system, allowing the body to return to a state of relaxation. Mindfulness exercises can help reduce stress and anxiety, thereby lowering blood pressure, which is crucial for cardiovascular patients (26). Lower blood pressure can reduce the risk of cardiovascular events. Mindfulness helps individuals deal with their emotions more constructively. Instead of avoiding unpleasant emotions or experiencing intense emotional reactions, they learn to accept their emotions and deal with them in a mindful manner. Improving quality of life: By reducing psychological symptoms such as stress, anxiety, and depression, patients can improve their quality of life. They often report feeling more relaxed, having better relationships with others, and enjoying their everyday lives more (27). Mindfulness-based therapy, which emphasizes non-judgmental acceptance of the present, can be a strategy for reducing stress, anxiety, and other psychological effects of cardiovascular diseases. This approach helps patients face psychological challenges more effectively by accepting their internal experiences, rather than avoiding or fighting them (28). Therefore, the present study aims to examine the effectiveness of mindfulness-based therapy in reducing dark personality traits and experiential avoidance in individuals with cardiovascular diseases. With these objectives in mind, the current study seeks to fill the existing gap in the research literature in this area and provides a comprehensive perspective on the role of mindfulness therapy in improving dark personality traits and experiential avoidance in individuals with cardiovascular diseases.

2. Methods and Materials

2.1. Study Design and Participants

The design utilized in this study was a quasi-experimental pre-test-post-test with a control group. The population of this research comprised patients with cardiovascular diseases attending medical centers in Tehran in 2023. The sample for this research was selected from patients with cardiovascular diseases and was randomly divided into two groups: experimental (15 individuals) and control (15 individuals). The inclusion criteria for the study were having cardiovascular disease, willingness to cooperate, consent to participate in the intervention, and having a minimum education level of a high school diploma. The exclusion criteria were having chronic psychological disorders and severe depression.

To ensure ethical considerations in the research, a consent form was prepared that broadly explained the purpose of the research. Participants first read the consent form and participated in the study if they wished. One of the aspects explained to the participants was the assurance that there would be no personal misuse of the research, and some participants wanted to know the results of their responses to the questionnaire; a simple language report interpreting the individuals' questionnaire responses was provided to them. Efforts were made to ensure that the entered data did not harm the sample group and that the results of this research could be used for the advancement of the sample and could be generalized to a similar population. Additionally, the confidentiality of the questionnaires and their results was explained to the participants; at the end of the research ethics observation, the mindfulness intervention was also applied to the control group after the research phase was completed.

2.2. Measures

2.2.1. Dark Triad of Personality

This is a psychological tool used to measure three negative personality traits in individuals: narcissism, Machiavellianism, and psychopathy. This questionnaire is designed to better understand behaviors and tendencies that may affect social interactions, ethical decision-making, and work relationships. There are various questionnaires for assessing dark personality traits, but among them, the SD3 is one of the most recognized and widely used. The SD3 typically includes separate sections for each of the three traits, with questions rated on a Likert scale (usually from strongly disagree to strongly agree). The validity of the Dark Triad of Personality Questionnaire has been well examined by various studies. Content validity has been confirmed through ensuring that the questions accurately reflect each of the dark traits. Construct validity has been confirmed

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through confirmatory factor analysis and comparing the obtained scores with other related criteria such as antisocial behaviors and career success. The reliability of the questionnaire has also been confirmed through various studies. Internal reliability, often measured using Cronbach's alpha for each of the three traits, shows that the questionnaire reliably measures each trait consistently. Additionally, temporal reliability, assessed through repeated measurements at different time intervals, has demonstrated that the questionnaire can maintain the stability of scores for each trait over time (29).

2.2.2. Experiential Avoidance

This 10-item questionnaire was created by Bond et al. in 2007. The original version of this scale, developed by Hayes et al. in 2004, had 36 questions. This questionnaire measures experiential avoidance on a 7-point Likert scale from 1 (never) to 7 (always true). Scores ranging from 10 to 24 indicate low experiential avoidance, scores from 25 to 45 indicate moderate experiential avoidance, and scores from 46 to 70 indicate high experiential avoidance. Bond et al. (2011) found that the 10-item version of this questionnaire has desirable internal reliability and stability, reporting a retest reliability over a 12-month period of 0.84; they also reported satisfactory concurrent validity through its correlation with the Depression Anxiety Stress Scales (DASS). Additionally, Shafiei et al. (2017) confirmed the reliability of this scale using Cronbach's alpha at 0.76 and validated its content and face validity. The reliability of this questionnaire in this research was reported using Cronbach's alpha at 0.78 (30).

2.3. Intervention

2.3.1. Mindfulness-Based Therapy

The intervention protocol for this study was designed around an 8-week Mindfulness-Based Therapy (MBT) program, aimed at reducing dark personality traits and experiential avoidance in individuals with cardiovascular diseases. Each session was conducted once a week and lasted for approximately 90 minutes. The program integrated traditional mindfulness practices with psychological strategies to enhance emotional and cognitive regulation. Through guided meditations, group discussions, and practical exercises, participants were encouraged to develop mindfulness skills that could be applied to daily life, fostering greater awareness and acceptance of present-moment experiences without judgment (31).

Session 1: Introduction to Mindfulness

The first session introduced participants to the concept of mindfulness, outlining its origins and the benefits it offers for mental and physical health. The facilitator explained the goals of the program and what participants could expect in the coming weeks. A basic mindfulness meditation focusing on breath awareness was introduced, guiding participants to notice their breathing patterns and how to bring attention back to the breath when the mind wanders. This session set the foundation for all subsequent practices.

Session 2: Body Scan Meditation

During the second session, participants engaged in a body scan meditation, a practice that involves paying attention to different parts of the body sequentially from head to toe. This exercise aims to increase body awareness and highlight the connection between mental states and physical sensations. Participants were taught to observe without judgment and respond to discomfort with curiosity rather than avoidance.

Session 3: Dealing with Emotions

This session focused on recognizing and managing emotions through mindfulness. Participants were introduced to techniques for identifying emotional triggers and their physiological responses. Mindfulness practices were tailored to help participants observe their emotions without becoming overwhelmed by them, promoting a more measured and thoughtful response to emotional challenges.

Session 4: Developing Self-Compassion

The fourth session centered on cultivating self-compassion, an essential aspect of reducing harsh self-criticism and negative self-judgments, which are common in individuals with dark personality traits. Participants practiced meditations that encouraged a kind and forgiving attitude toward themselves, especially when confronting personal failures or perceived inadequacies.

Session 5: Mindfulness in Daily Activities

Participants learned how to integrate mindfulness into everyday activities, such as eating, walking, or speaking. The session emphasized the importance of maintaining mindfulness throughout the day, not just during formal

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meditation. By practicing mindfulness in routine activities, participants could enhance their overall attentiveness and presence in the moment.

Session 6: Communication and Mindfulness

This session introduced mindful communication techniques. Participants practiced listening with full attention and speaking authentically and compassionately. Role-playing exercises were used to demonstrate how mindfulness could improve communication in relationships, reduce misunderstandings, and support more meaningful connections with others.

Session 7: Overcoming Experiential Avoidance

Focusing on experiential avoidance, this session taught participants how to face uncomfortable thoughts and situations instead of avoiding them. Through guided reflections and group discussions, participants explored the consequences of avoidance and practiced strategies for confronting challenging experiences directly with mindfulness.

Session 8: Consolidation and Future Planning

The final session reviewed the skills learned throughout the program and discussed ways to continue practicing mindfulness after the program's conclusion. Participants shared their experiences and progress, reflecting on how mindfulness had impacted their behaviors and attitudes. The facilitator provided resources for ongoing practice, including local mindfulness groups, online programs, and literature.

2.4. Data Analysis

In the descriptive analysis of the data, statistical indices related to each of the research variables were calculated. In the inferential statistics section, repeated measures analysis of variance was utilized, and the SPSS-22 software was employed.

3. Findings and Results

The mean (standard deviation) age of participants in the experimental group was 38.5 (8.7) years and in the control group was 36.9 (7.7) years. Additionally, the minimum and maximum ages in the experimental group were 26 and 43 years, respectively, and in the control group, 27 and 42 years, respectively.

Table 1

Descriptive Statistics for Research Variables by Test Type and Groups

Variable	Phase	Experimental Group	Control Group
Narcissism	Pre-test	27.20 (4.36)	25.93 (4.02)
	Post-test	20.81 (3.48)	24.22 (3.42)
	Follow-up	19.93 (3.49)	24.33 (3.19)
Machiavellianism	Pre-test	20.26 (3.01)	19.66 (3.41)
	Post-test	15.46 (3.20)	19.46 (3.24)
	Follow-up	14.46 (3.41)	19.33 (2.84)
Psychopathy	Pre-test	17.53 (3.22)	17.86 (3.87)
	Post-test	13.60 (3.54)	17.80 (3.05)
	Follow-up	12.40 (2.61)	16.60 (3.01)
Experiential Avoidance	Pre-test	23.46 (7.23)	24.26 (7.63)
	Post-test	15.06 (4.40)	23.93 (6.43)
	Follow-up	16.11 (4.26)	23.86 (6.69)

According to the results in Table 1, the mean dimensions of all variables with a negative semantic load decreased in the post-test and follow-up stages in the experimental group, while no change was observed in the control group.

Prior to conducting the analyses, various assumptions were rigorously checked and confirmed to ensure the accuracy and reliability of the statistical results. Assumptions of normality were verified with Kolmogorov-Smirnov tests, which confirmed that the distribution of scores for all variables was normal ($p > .05$). Homogeneity of variances was tested using Levene's Test and showed no significant violations ($p > .05$). Sphericity, relevant for the repeated measures ANOVA, was assessed using Mauchly's test, and where sphericity was not assumed, Greenhouse-Geisser corrections were applied. Multicollinearity was not an issue, as indicated by variance inflation factors (VIF)

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below 10 for all predictor variables. These checks ensured that the subsequent analyses were conducted on a robust dataset, providing valid and reliable findings.

Table 2

Repeated Measures ANOVA for Comparing Pre-test, Post-test, and Follow-up of Dark Personality Traits and Experiential Avoidance in Experimental and Control Groups

Variable	Source of Effect	Sum of Squares	Degrees of Freedom	Mean Squares	F-Value	Significance	Eta Squared
Narcissism	Time*Group	70.067	2	35.033	4.262	.001	.132
	Group	187.267	1	187.267	10.830	.001	.402
Machiavellianism	Time*Group	159.756	2	79.878	29.803	.001	.516
	Group	112.067	1	112.067	32.063	.001	.534
Psychopathy	Time*Group	156.800	2	78.400	15.116	.001	.351
	Group	56.067	1	56.067	8.162	.008	.226
Experiential Avoidance	Time*Group	59.267	2	29.633	12.761	.001	.313
	Group	35.267	1	35.267	10.891	.003	.280

Results from Table 2 indicate that the F-ratios obtained for the group factor were significant for both dark personality traits and experiential avoidance ($p < .01$). This finding suggests that mindfulness training led to improvements in dark personality traits and experiential avoidance. A repeated measures ANOVA was conducted for the experimental group across three stages of therapeutic intervention, observing significant improvements in the dimensions of dark personality traits and experiential avoidance ($p < .01$).

Table 3

Bonferroni Post Hoc Results Within the Mindfulness Training Group for Dark Personality Traits and Experiential Avoidance

Variable	Phase Comparison	Mean Difference	Standard Error	P-value
Narcissism	Pre to Post	-4.39	2.50	.008
	Pre to Follow-up	-5.54	2.51	.031
	Post to Follow-up	-10.72	2.44	.001
Machiavellianism	Pre to Post	-4.39	2.50	.005
	Pre to Follow-up	-1.15	2.63	.020
	Post to Follow-up	-6.33	2.58	.010
Psychopathy	Pre to Post	-5.54	2.51	.003
	Pre to Follow-up	-1.61	1.10	.010
	Post to Follow-up	-2.86	1.23	.010
Experiential Avoidance	Pre to Post	-7.281	2.39	.001
	Pre to Follow-up	-6.78	1.13	.001
	Post to Follow-up	-6.33	1.29	.001

Changes over time in the experimental group in Table 3 showed significant differences in the dimensions of dark personality traits in the mindfulness training group in the post-test compared to the pre-test ($p < .001$). Significant differences were also observed in the follow-up phase compared to both the pre-test and post-test ($p < .001$). Similarly, experiential avoidance in the mindfulness training group was significant in the post-test compared to the pre-test ($p < .001$), and also in the follow-up phase compared to both the pre-test and post-test ($p < .001$).

4. Discussion and Conclusion

The objective of the present study was to determine the effectiveness of Mindfulness-Based Therapy (MBT) on dark personality traits and experiential avoidance in individuals with cardiovascular diseases. The results demonstrated that MBT was effective in reducing dark personality traits and experiential avoidance in this patient group.

In explaining this finding, it can be stated that MBT, with its focus on momentary awareness and non-judgmental

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acceptance, helps patients engage more constructively with their internal and external experiences. This approach encourages individuals to accept unpleasant experiences as part of their reality instead of avoiding them, and to confront these experiences in a conscious and intentional manner. This shift in attitude and behavior can lead to a reduction in dark personality traits and promote more positive behaviors. Furthermore, the results indicated that mindfulness could serve as an effective tool for reducing experiential avoidance (27). Experiential avoidance, often associated with high levels of stress, anxiety, and depression, can lead to adverse health outcomes in cardiovascular patients. MBT, by reducing the tendency to avoid painful experiences, can help individuals face life's challenges more effectively and enjoy better mental health. Mindfulness-based therapy can have a significant impact on experiential avoidance and, in turn, these changes can lead to a reduction in dark personality traits and promote more positive behaviors (25).

Mindfulness helps individuals face unpleasant feelings, thoughts, and experiences with greater acceptance. This conscious acceptance enables the individual to recognize and accept painful experiences without judgment and with an open mind. Experiential avoidance is often the result of automatic reactions to negative experiences. Mindfulness, by teaching to pause and reflect before reacting, helps reduce these automatic responses and allows for a more conscious evaluation of feelings and events. Mindfulness fosters self-awareness, which can lead to the identification and differentiation of dark personality traits, such as narcissism or Machiavellianism, from more positive personality elements. With increased awareness of these traits, individuals can find ways to manage and moderate them. Promoting tolerance to distress: Instead of avoiding distress, mindfulness offers ways to tolerate and manage it. This increased tolerance can lead to a reduction in the need to adopt defensive or destructive behaviors often associated with dark personality traits (27).

Changes in attitudes and behaviors resulting from mindfulness, through reduced experiential avoidance and increased acceptance and self-awareness, can lead to a reduction in dark personality traits and promote more positive behaviors. These changes not only help improve personal and social relationships but also enhance mental health and overall well-being. Ultimately, mindfulness can serve as a powerful tool for personal development and positive change in people's lives (24). Consequently, this study confirms the effectiveness of Mindfulness-Based Therapy in reducing dark personality traits and experiential avoidance in patients with cardiovascular diseases. These findings suggest that MBT can be considered an important component of comprehensive treatment programs for this patient group. Further promotion and integration of mindfulness in therapeutic interventions could lead to significant improvements in the mental health and well-being of cardiovascular patients.

Authors' Contributions

M.S. conceptualized the study, designed the methodology, and coordinated the implementation of the mindfulness-based therapy sessions. M.A., the corresponding author, conducted the data analysis using analysis of covariance, interpreted the results, and led the manuscript writing process. P.G. assisted with the development of research instruments, collected data, and contributed to the literature review. M.Y. supported the recruitment of participants, facilitated the logistics of the therapy sessions, and participated in drafting the discussion section. All authors reviewed the manuscript critically 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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