IJBMC
International Journal of Body, Mind and Culture

Volume 12, Issue 1, pp 70-77
DOI: 10.61838/ijbmc.v12i1.726

Article type:
Original Research

# The Effectiveness of Mindfulness-Based Cognitive Therapy on Death-Related Distress, Psychological Hardiness, and Psychological Symptoms in Breast Cancer Patients

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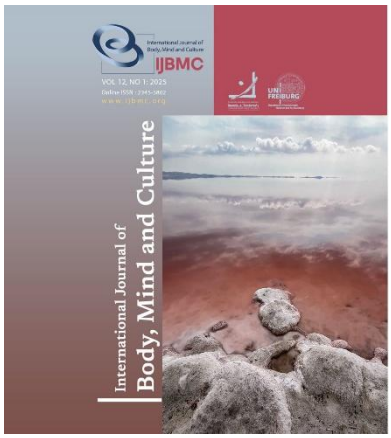


Article history:

Received 25 May 2024
Revised 10 June 2024
Accepted 14 June 2024
Published online 2 Feb 2025

How to cite this article:
Aghahheris, M., Pourmousaabkenar, S., Rahmanian, M., & Kordmirza Nikoozadeh, E. (2025). The Effectiveness of Mindfulness-Based Cognitive Therapy on Death-Related Distress, Psychological Hardiness, and Psychological Symptoms in Breast Cancer Patients. International Journal of Body, Mind and Culture, 12(1), 70-77.



## ABSTRACT

**Objective:** This study investigates the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) in alleviating these symptoms and enhancing psychological hardiness in breast cancer patients.

**Methods and Materials:** A semi-experimental study with a pre-test, post-test, and follow-up design was conducted, including a control group. The sample consisted of 30 women diagnosed with breast cancer at the Women's Cancer Specialist Center of Khatamol-Anbiya in Tehran in 2023. Participants were randomly assigned to an experimental group (MBCT) or a control group (no intervention). Data were collected using validated scales for death anxiety, death depression, psychological hardiness, and psychological symptoms. Statistical analysis was performed using SPSS version 26.

**Findings:** MBCT significantly reduced death anxiety (P = 0.001, F = 15.63), death depression (P = 0.004, F = 21.56), and psychological symptoms (P = 0.001, F = 47.36), and enhanced psychological hardiness (P = 0.004, F = 4.65).

**Conclusion:** MBCT effectively reduces death-related distress, enhances psychological hardiness, and alleviates psychological symptoms in breast cancer patients. These findings suggest MBCT as a valuable therapeutic tool for improving the well-being of breast cancer patients.

**Keywords:** Breast Cancer, Death-Related Distress, Mindfulness-Based Cognitive Therapy, Psychological Hardiness, Psychological Symptoms.

## Introduction

Breast cancer is the most commonly diagnosed cancer among women, contributing to a substantial percentage of cancer-related deaths (Wu et al.). With one in eight women facing a breast cancer diagnosis in their lifetime (Kamian et al.), its impact extends beyond physical health, deeply affecting mental well-being. The psychological stress associated with breast cancer, including fear of recurrence, can exacerbate symptom burden and lead to severe mental health conditions such as post-traumatic stress disorder (Teo et al.). The perception of cancer as a life-threatening condition often leads to the exacerbation of psychological issues such as death and depression anxiety among patients (Li et al.; Taghipour et al.). Unfortunately, people consider cancer to be the end of life, and after being diagnosed with the disease, patients see themselves closer to death, and for this reason, they experience distress related to death. In other words, patients suffer from death anxiety and depression (Taghipour et al.). Death-related distress can be so severe that patients desire death over their current condition (Hadler et al.).

Research has shown that cancer patients often face death anxiety, which is characterized by an irrational and morbid fear of death or dying. This fear can be so intense that it may lead to death phobia and a great fear of the dead (Li et al.). Cancer patients may also experience death depression, which involves depressive attitudes related to death and nothingness (Taghipour et al.). Cancer patients often experience fear and anxiety, but those with higher levels of hardiness demonstrate greater strength and adaptability in facing the challenges associated with the disease (Barghi Irani & Dehghan Saber, 2021). Research has shown that psychological hardiness, characterized by resilience, optimism, and stress resistance, can significantly impact the quality of life of individuals fighting cancer (Barghi Irani & Dehghan Saber; Dewi et al.). Individuals with psychological hardiness tend to consider life activities controllable, interesting, important, and meaningful, engaging in efforts to enhance their living conditions and society (Mawella et al.). Research has shown that cancer diagnosis and treatment can have a significant negative psychological impact, increasing the risk of mood disorders like anxiety and depression (Alwhaibi et al.). Coping with cancer, its symptoms, and treatment can lead to elevated stress levels in patients, further predisposing them to anxiety and depression (Hu et al., 2021). The prevalence of anxiety and depression is relatively high among cancer patients, emphasizing the importance of close attention to the diagnosis and treatment of these comorbid disorders (Tehrani et al.).

Incurable diseases like cancer profoundly impact a person's mental well-being, creating a complex web of physical, psychological, and economic challenges. Psychological interventions can play a crucial role in mitigating the physical and medical burdens of cancer, easing the difficulties of treatment, and enhancing coping skills to navigate the disease's challenges (Nabipoor Gisi et al.). Mindfulness-Based Cognitive Therapy (MBCT) is a therapeutic approach that integrates cognitive-behavioral therapy (CBT) elements with mindfulness techniques. MBCT aims to prevent relapse in recurrent depression by enhancing individuals' awareness of their thoughts and emotions in the present moment) Manjaly & Iglesias(. Research has shown that MBCT can have positive effects on cancer patients, particularly in reducing symptoms of depression, anxiety, and cancer-related fatigue (Chayadi et al., 2022).

Breast cancer patients frequently experience significant psychological distress, including death-related distress, psychological symptoms, and a decline in psychological hardiness. These psychological challenges can negatively impact their quality of life and overall well-being. Despite advancements in cancer treatment, the psychological well-being of patients remains a critical aspect of their overall health and recovery. This study seeks to address these challenges by investigating the potential benefits of MBCT in enhancing psychological resilience and reducing psychological symptoms in breast cancer patients. This study aims to investigate the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) in reducing death-related distress, enhancing psychological hardiness, and mitigating psychological symptoms in breast cancer patients.

## Methods and Materials

### *Study Design and Participants*

This investigation employed an experimental methodology with a semi-experimental design, featuring both pre-test and post-test assessments and a control


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group, encompassing a follow-up period of 2 months. The research's statistical population included women diagnosed with breast cancer who were treated at the Women's Cancer Specialist Center of Khatamol-Anbiya in Tehran in 2023. The study's participants were selected through purposive sampling to ensure that only individuals meeting specific criteria were included.

Thirty individuals participated in the study, equally divided into experimental and control groups with 15 participants each. After purposive selection based on inclusion criteria (a confirmed diagnosis of breast cancer, age between 35 and 60 years, education level above the fifth grade, and voluntary consent), participants were randomly assigned to either the experimental or control group. This randomization process was crucial in mitigating potential biases.

Appropriate sample size for experimental and control groups depends on various factors, including the research design, objectives, the desired statistical power, and ethical considerations (Chow). It is suggested that a minimum of 15 participants per group is advisable to achieve meaningful results (Crowe et al.).

*Data Collection Tools*

**Death Anxiety Scale:** This questionnaire, created by (Templer), consists of 15 items designed to assess the subject's attitude towards death. Participants respond to each question with a yes or no answer. The reliability and validity of this scale in the country have been reported with a classification reliability coefficient of 0.60 and an internal consistency coefficient of 0.73. Furthermore, this scale demonstrates a correlation coefficient of 0.34 with the anxiety scale (Taghipour et al.).

**Death Depression Scale:** Developed by (Templer et al.), this questionnaire comprises 17 items that gauge depressive attitudes toward death. It offers two binary-choice forms and a Likert scale for responses. Participants provide their answers on a five-point Likert scale ranging from completely agree (4 points) to disagree (zero points) completely. In Iran, the death anxiety test was utilized to assess validity, resulting in a reported value of 0.73. The retest reliability and Cronbach's alpha coefficient were calculated at 0.92 and 0.90, respectively (Taghipour et al.).

**Lang and Goulet Psychological Hardiness Scale:** Developed by (Lang et al.), this questionnaire assesses psychological hardiness and comprises 42 questions. Utilizing a self-report format, the scale consists of 45 questions rated on a five-point Likert scale, ranging from strongly disagree to strongly agree. It assesses three key components: commitment, control, and challenge-seeking. In a study conducted by Roshan and Shakri, the validity and reliability of this scale were examined, resulting in a refined version with 42 questions demonstrating moderate to high validity and a reliability coefficient, as measured by Cronbach's alpha, of 0.86 (Mahmoudian et al.).

**Depression Anxiety Stress Scales:** The (Lovibond & Lovibond) Depression, Anxiety, and Stress Scales, also known as Questionnaire of Psychological Symptoms, is a set of three self-report scales designed to evaluate negative emotional states in depression, anxiety, and stress. Each subscale consists of seven questions, with scores ranging from zero (not applicable to me at all) to 3 (extremely applicable to me). In Iran, the validity and reliability of this questionnaire were examined, with test-retest validity reported as 0.80, 0.76, and 0.77 for the depression, anxiety, and stress scales and Cronbach's alpha reported as 0.81, 0.74, and 0.78, respectively (Shokoohi Nejad et al., 2022 and quality of life in patients with fibromyalgia).

*Intervention*

The experimental group underwent Mindfulness-Based Cognitive Therapy (MBCT) according to Park et al. (2020), delivered in weekly sessions lasting 90 minutes. The MBCT program spanned eight weeks, and each session was meticulously structured to cover specific content and objectives:

Session 1: Introduction to Mindfulness and Psychoeducation on Psychological Reactions

The first session focuses on educating participants about the psychological reactions of cancer patients, including emotional distress, anxiety, and cognitive challenges. The concept of mindfulness is introduced as a tool to enhance psychological resilience. Participants engage in experiential exercises such as mindful eating (raisin exercise) and a guided body scan to cultivate present-moment awareness. The session concludes with a discussion on the importance of practicing mindfulness regularly. Homework includes practicing mindful eating and body scanning at home to establish a foundation for mindfulness skills.

Session 2: Association of Mood and Thoughts


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This session explores the connection between mood and thought patterns, emphasizing how automatic negative thoughts can influence emotional well-being. Participants continue practicing the body scan and are introduced to mindful breathing meditation to strengthen their ability to focus on the present. They are encouraged to observe their thoughts and emotions without judgment. Homework includes practicing the body scan and mindful breathing daily, along with recording pleasant activities and events to foster positive awareness.

Session 3: Identifying Pleasant Activities and Events

Building on the previous session, participants learn to identify and engage in pleasant activities to improve mood and well-being. The exercises for this session include mindfulness meditation, gentle yoga movements, and mindful walking, which encourage a deeper connection with bodily sensations and surroundings. The discussion highlights the role of mindfulness in savoring positive experiences. Homework includes practicing mindfulness meditation, gentle yoga, and mindful walking to reinforce mindful engagement with daily life.

Session 4: Reactions to Pleasant and Unpleasant Events

This session focuses on recognizing and understanding emotional reactions to both positive and negative events. Participants explore how mindfulness can help them respond rather than react impulsively to life's challenges. Various mindfulness meditation exercises are practiced to increase awareness and emotional regulation. Homework includes continued mindfulness meditation and the introduction of the three-minute breathing space exercise, which serves as a quick tool for grounding oneself during stressful situations.

Session 5: Cultivating Compassion, Appreciation, and Gratitude

Participants learn about the role of compassion, appreciation, and gratitude in enhancing psychological resilience and emotional well-being. The exercises include mindfulness meditation and compassion meditation (loving-kindness), fostering self-kindness and empathy toward others. Participants are encouraged to shift their focus toward positive life experiences and develop gratitude-based practices. Homework involves building pleasant habits, recording moments of appreciation and gratitude, and continuing mindfulness meditation to strengthen a compassionate mindset.

Session 6: Understanding Cognitive Biases

This session introduces the concept of cognitive biases, helping participants recognize unhelpful thinking patterns that may contribute to stress and distress. Through mindfulness meditations and compassion meditation, participants practice observing their thoughts with curiosity rather than judgment. The discussion highlights the importance of self-awareness in challenging cognitive distortions. Homework includes continuing mindfulness meditation and maintaining a gratitude journal to reinforce positive cognitive restructuring.

Session 7: Choosing Functional Behaviors and Identifying Triggers

Participants explore strategies for behavioral activation, learning how to choose functional and adaptive responses to life's challenges. They identify personal triggers for emotional distress and practice mindful awareness in responding effectively. The exercises include mindfulness meditation and compassion meditation, reinforcing emotional regulation skills. Homework focuses on identifying and documenting personal triggers, as well as practicing mindful responses through continued meditation.

Session 8: Course Review and Future Mindfulness Practice

The final session serves as a review of the entire course, allowing participants to reflect on their personal mindfulness journey and discuss their progress. They explore strategies for maintaining mindfulness practice in daily life and developing long-term resilience. The session includes a body scan and mindfulness meditation to reinforce the learned skills. Participants share their experiences, set goals for future mindfulness practice, and engage in a closing discussion as they prepare to continue their mindfulness journey independently.

*Data analysis*

Data were collected using univariate and multivariate analyses and repeated covariance measures. The analysis was performed using SPSS version 26. By detailing the randomization process and providing a comprehensive breakdown of the MBCT sessions, the methodology section now offers clearer insights into the study's design and intervention specifics.



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## Findings and Results

The average age of participants in the experimental group was 31.45 years (SD = 2.11), while the average age in the control group was 32.85 years (SD = 1.92). Mean and standard deviation of research variables are presented in Table 1.

**Table 1**

*Mean and standard deviation of research variables*

| Source of variance | Group | Mean (Standard deviation) | | |
|---|---|---|---|---|
| | | Pre-test | Post-test | Follow-up |
| Death Anxiety | MBCT | 10.68 (1.74) | 8.19 (1.31) | 8.28 (1.125) |
| | Control | 10.73 (1.86) | 11.09 (2.11) | 10. 96 (2.09) |
| Death Depression | MBCT | 48.35 (6.34) | 36.20 (5.64) | 35.53 (5.75) |
| | Control | 47.62 (6.17) | 46.84 (7.13) | 47.53 (25.35) |
| Psychological Hardiness | MBCT | 58.73 (6.55) | 74.56 (8.57) | 72.36 (8.30) |
| | Control | 59.53 (6.39) | 60.24 (5.75) | 60.15 (6.93) |
| Psychological Symptoms | MBCT | 81.21 (9.51) | 58.46 (6.91) | 59.34 (7.37) |
| | Control | 80.46 (9.96) | 82.72 (8.93) | 81.54 (8.16) |

The data analysis showed that the necessary assumptions for the covariance test were met. The Shapiro-Wilk test indicated that the scores were distributed normally. The results of the multivariate analysis of covariance, controlling for the effects of pre-test scores, showed a significant difference between the experimental and control groups in one of the research variables. Levene's test suggested that the variance error within the variables was not statistically significant, and the non-significant results of the Mbox test indicated that the assumption of homogeneity of the covariance matrix was met. Furthermore, the level of significant interaction between the group and pre-test scores of the research variables was insignificant, indicating that the assumption of homogeneity of regression slopes was met and the necessary conditions for analyzing the covariance test were satisfied. The significance levels of all four multivariate statistics, including Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root, are significant at the level of 0.001 (P < 0.01), indicating that the intervention had a general effect on the dependent variables.

**Table 2**

*The result of covariance analysis for research variables*

| Variable | Source of variations | Sum of squares | df | Mean of squares | F | P | Eta |
|---|---|---|---|---|---|---|---|
| Death Anxiety | Group | 58.26 | 1 | 58.26 | 15.63 | <0.001 | 0.45 |
| Death Depression | Group | 856.75 | 1 | 856.75 | 21.56 | <0.001 | 0.56 |
| Psychological Hardiness | Group | 286.355 | 1 | 286.355 | 4.65 | <0.001 | 0.21 |
| Psychological Symptoms | Group | 1567.24 | 1 | 1567.24 | 47.36 | <0.001 | 0.80 |

A univariate analysis of covariance was conducted to analyze the data (Table 2). After controlling for the pre-test scores, the results showed a significant difference between the control and experimental groups in the research variables. Specifically, the experimental group exhibited significantly lower scores in death anxiety (P = 0.001, F = 15.63) and death depression (P = 0.004, F = 21.56), as well as significantly higher scores in psychological hardiness (P = 0.004, F = 4.65), compared to the control group. Additionally, the experimental group had significantly lower scores in psychological symptoms (P = 0.001, F = 47.36) than the control group.

**Table 3**

*Differences in two-by-two comparison of pre-test, post-test, and follow-up stages*

| Variable | Stage (I) | Stage (J) | mean difference (I-J) | Std. Error | Sig |
|---|---|---|---|---|---|
| Death Anxiety | pretest | posttest | 2.49 | 0.34 | 0.05< |
| | pretest | follow up | 2.4 | 0.35 | 0.05< |

| | | | | | |
|---|---|---|---|---|---|
| Death Depression | pretest | posttest | 12.15 | 0.75 | 0.05< |
| | pretest | follow up | 12.82 | 0.88 | 0.05< |
| Psychological Hardiness | pretest | posttest | -15.83 | 1.143 | 0.05< |
| | pretest | follow up | -13.63 | 1.176 | 0.05< |
| Psychological Symptoms | pretest | posttest | 22.75 | 1.963 | 0.05< |
| | pretest | follow up | 21.87 | 1.982 | 0.05< |

As shown in Table 3, the average scores of the pre-test, post-test, and follow-up research variables are significantly different. This means that MBCT significantly increased the post-test and follow-up scores compared to the pre-test.

## Discussion and Conclusion

This study aims to investigate the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on death-related distress, psychological hardiness, and psychological symptoms in breast cancer patients. The results showed that the MBCT is effective in death-related distress, psychological hardiness, and psychological symptoms in breast cancer patients. This outcome is consistent with the research of (Alitabar & Zadhasn, 2023), (Shi), (Bidstrup et al.), and (Chayadi et al., 2022).

The primary goal of MBCT is to encourage participants to engage with their thoughts, emotions, and bodily sensations through mindful awareness, breaking the cycle of rumination, maladaptive emotion regulation, and self-criticism that can contribute to depressive relapse (de Klerk-Sluis et al.). Cancer diagnosis often triggers anxieties related to mortality, which can significantly impact the mental health and overall quality of life of individuals. Patients facing cancer-related anxieties may benefit from MBCT as it teaches them to observe and accept their thoughts and emotions without judgment, thereby reducing the intensity of these feelings and enhancing emotional regulation (Pedro et al.). developing mindfulness skills, such as through MBCT, can enhance psychological hardiness in patients, characterized by a sense of control, commitment, and challenge, enabling individuals to navigate better challenges associated with cancer diagnoses (Oberoi et al.). MBCT benefits psychological symptoms, including anxiety and depression, in cancer patients. Regular meditation practice, as promoted in MBCT, can reduce psychological distress and alleviate physical symptoms in cancer patients (Farver-Vestergaard et al.). By emphasizing present-moment awareness, MBCT assists patients in distancing themselves from repetitive thoughts and distressing emotions, fostering a sense of tranquility and overall well-being.

While the study provides valuable insights, some limitations should be noted. The relatively small sample size limits the generalizability of the findings to a larger population of breast cancer patients. Additionally, the study design may introduce biases that could affect the outcomes. Future research should address these limitations by using larger sample sizes, examining the effectiveness of MBCT in conjunction with other interventions, extending follow-up periods, and incorporating objective measures alongside self-report data.

Future research could build on these findings by conducting larger-scale studies to validate the effectiveness of MBCT across diverse populations. It would also be beneficial to explore the long-term impact of MBCT on breast cancer patients, including potential variations in response based on individual patient characteristics. Specific studies could focus on integrating MBCT with other therapeutic interventions to enhance overall treatment efficacy.

The findings demonstrate that MBCT significantly reduces death-related distress, enhances psychological hardiness, and alleviates psychological symptoms. These positive outcomes suggest that MBCT can be a valuable therapeutic tool for improving the overall well-being of breast cancer patients. By equipping patients with mindfulness techniques and cognitive strategies, MBCT empowers them to navigate the emotional and psychological complexities of their journey, fostering resilience and promoting a sense of control over their well-being.

## Acknowledgments

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

## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

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

## Transparency of Data

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

## Funding

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

## Authors' Contributions

All authors equally contributed to this study.

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E-ISSN: 2345-5802