

Article type:
Original Research

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Article history:

Received 12 Jul 2025
Revised 28 Jul 2025
Accepted 20 Sep 2025
Published online 01 Oct 2025

How to cite this article:

Karimpour, SH., Haji Alizadeh, K., & Zarei, E. (2025). Psychometric Evaluation and Normative Validation of the Beliefs and Attitudes Toward Transgenderism Scale in an Iranian Population. *International Journal of Body, Mind and Culture*, 12(7), 194-203.



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The Effectiveness of a Mindfulness-Based Psychological Coping Skills Training Program on Psychological Self-Efficacy in Women with Breast Cancer

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ABSTRACT

Objective: Psychological self-efficacy—one’s belief in the ability to manage mental and emotional challenges—is a critical factor in coping with chronic illness. Mindfulness-based interventions have demonstrated promise in promoting adaptive coping, but their effects on self-efficacy in cancer patients remain underexplored in culturally specific contexts such as Iran. This study aimed to evaluate the effectiveness of a structured mindfulness-based psychological coping skills training program on psychological self-efficacy in women with breast cancer in Bandar Abbas, Iran.

Methods and Materials: Using a quasi-experimental pretest–posttest design with control group and two-month follow-up, 30 women diagnosed with breast cancer were recruited through purposive sampling and randomly assigned to experimental ($n = 15$) and control ($n = 15$) groups. The intervention group participated in a 10-session mindfulness-based coping skills program. Psychological self-efficacy was measured using Sherer et al.’s Self-Efficacy Scale. Data were analyzed using repeated measures ANOVA and Bonferroni post hoc tests.

Findings: The experimental group showed significant improvements in psychological self-efficacy scores from pretest to posttest and follow-up compared to the control group ($p < 0.001$). Multivariate analysis revealed large effect sizes ($\eta^2 > 0.85$), indicating the intervention’s strong impact over time.

Conclusion: The findings suggest that mindfulness-based coping skills training can significantly enhance psychological self-efficacy in women with breast cancer. Culturally adapted, structured interventions may serve as effective adjuncts in psychosocial cancer care. Further research with larger samples and longer-term follow-up is warranted.

Keywords: coping skills, mindfulness, psychological self-efficacy, breast cancer.

Introduction

Breast cancer is a major health concern affecting women worldwide. It is characterized by uncontrolled hyperplasia of breast epithelial cells influenced by various carcinogenic factors (Jiang, 2023; Kadhim & Mohammed, 2025). Breast cancer is a heterogeneous condition with diverse clinical outcomes depending on molecular subtypes and pathological features (Al-Zubaidi et al., 2022). It is the most common cancer among women globally, with millions of cases diagnosed each year (Pinto et al., 2022). Approximately 1 in 8 women are diagnosed with breast cancer during their lifetime (Penberthy et al., 2023). With 2.3 million new cases reported in 2020, breast cancer was the most prevalent form of cancer (Arefian et al., 2023). Furthermore, it is a leading cause of cancer-related deaths among women, especially in developing countries, and the primary cause of mortality among women aged 20 to 50 (Lu et al., 2022). Its incidence continues to rise, making it a significant public health issue. Factors such as overweight and obesity (Musabaganwa et al., 2023), triple-negative markers (Chen et al., 2023; Jadhav et al., 2023), and autoimmune diseases (Farkouh et al., 2023) have been associated with its prevalence. Genetic mutations such as PIK3CA are also linked to the onset of breast cancer (Degeneffe et al., 2023).

Women diagnosed with breast cancer are at increased risk of depression, anxiety, and other stress-related disorders that negatively affect their mental health (Soria-Reyes et al., 2024). Chronic psychological stress has been identified as an independent risk factor for the development and metastasis of breast cancer (Zhang et al., 2022). Patients often face significant stress following diagnosis and throughout treatment processes such as surgery, chemotherapy, and radiotherapy. Notably, those experiencing high psychological distress, such as fear of recurrence, exhibit greater uncertainty about their prognosis and are more susceptible to mental health issues including post-traumatic stress disorder (Ding et al., 2024). Stress is a common mental health condition that arises when demands exceed an individual's coping capacity (Benchekroun et al., 2023). Its sources may include social isolation, personal and family health concerns, academic uncertainties, or everyday stressors like managing chronic conditions

(Romeo et al., 2021; Rechenberg et al., 2024). Stress not only affects mental health but can also lead to physical health problems (Aoki et al., 2024), including memory impairment, lack of concentration, and insomnia (Su et al., 2023).

Patients and even survivors of breast cancer often face various psychological challenges, including distress and reduced quality of life. However, research indicates that psychological factors such as psychological self-efficacy play an important role in alleviating these challenges. Self-efficacy is positively associated with resilience (Kim & Sok, 2024) and psychological well-being (Singtaweek et al., 2024) in breast cancer patients, contributing to better coping, self-management, and quality of life (Park et al., 2023). Additionally, psychological self-efficacy enhances mental adjustment and functioning in breast cancer patients (Nuraini et al., 2023) and is an essential factor in managing the fear of recurrence among survivors (Lucas et al., 2023).

Psychological self-efficacy, a concept deeply rooted in psychology, refers to an individual's belief in their ability to successfully perform tasks and achieve desired goals (Wu et al., 2022). It encompasses one's confidence in navigating challenging situations and managing stress effectively (Zhang et al., 2022). It significantly influences various aspects of mental well-being, including cognition, emotions, and health-related decision-making. Furthermore, self-efficacy is closely tied to individuals' belief in their ability to cope with new challenges and is regarded as a strong predictor of hope (Yin et al., 2021).

To address psychological challenges, stress management interventions, such as cognitive-behavioral therapy (CBT) and mindfulness-based programs, have been developed to help women cope with breast cancer by reducing stress and enhancing overall quality of life (Hedhili, 2024). Mindfulness-based stress reduction programs have been studied for their effectiveness in alleviating emotional and physical distress in breast cancer patients (Horesh et al., 2022). Dahabre et al., (2024) emphasized the role of mindfulness in facilitating post-traumatic growth in breast cancer patients, highlighting the importance of promoting mindfulness in clinical interventions. Moreover, (Valluri et al., 2024) discussed how mind-body practices such as meditation can help breast cancer survivors acknowledge and manage the emotional impact of trauma, advocating for the integration of mindfulness into broader coping

strategies. Mindfulness involves maintaining moment-to-moment awareness of thoughts, emotions, bodily sensations, and the surrounding environment (Yin et al., 2021), and is characterized by an open and non-judgmental awareness of the present moment (Ayoko, 2023).

Mindfulness is a powerful tool that supports mental well-being by helping individuals enhance non-judgmental awareness of the present moment (Li, 2022). In addition, psychological coping skills are vital for the well-being of individuals with cancer. When under stress, people employ coping strategies, which are cognitive and behavioral efforts to interpret and manage problems. These strategies are categorized as problem-focused and emotion-focused. Problem-focused strategies are suited for situations that can be actively addressed and include active coping, planning, perseverance, and effective social support. Emotion-focused strategies, on the other hand, are used when situations must be accepted. These include emotional expression, positive reappraisal, religious coping, and acceptance. These approaches protect individuals from psychological and physical harm and enhance their adaptive functioning (Ayar et al., 2022).

Studies show that adaptive coping strategies, such as problem-focused coping, self-efficacy-based coping, and acceptance, are associated with better psychological outcomes and mental health in cancer patients. Both positive strategies like proactive coping and negative strategies like avoidance can help reduce psychological distress caused by cancer (Lu et al., 2022).

Despite significant advancements in medical treatments for breast cancer, the psychological needs of women affected by the disease remain under-addressed. The psychological dimensions of cancer—particularly the stress related to diagnosis, treatment, and physical and social changes—can severely impact mental health and even compromise the effectiveness of medical care. Mindfulness has gained recognition as an effective psychological approach for stress reduction and mental health promotion among patients. However, most existing studies have focused on the short-term effectiveness of mindfulness interventions, with limited emphasis on the development and validation of structured, comprehensive training packages, especially in Iran. Few studies have created mindfulness-based educational programs specifically for cancer patients,

and those that exist often rely on general or non-specialized interventions.

In the context of breast cancer, the development of a training package tailored to enhance psychological coping skills in women with the disease and directly improve their psychological self-efficacy remains a critical gap. Existing programs frequently fail to consider sociocultural and geographic differences, which may limit their effectiveness. In Bandar Abbas, given the region's unique sociocultural conditions and limited access to specialized psychological services, this research gap is even more pronounced. Therefore, the central research question of this study is: Does mindfulness-based psychological coping skills training improve psychological self-efficacy in women with breast cancer in Bandar Abbas?

Methods and Materials

This study employed a quasi-experimental design with pretest-posttest and control group including a follow-up phase. After obtaining informed consent and approval from relevant authorities, participants completed the research questionnaires. Participants were then selected and randomly assigned to two groups (experimental and control). The experimental group received the training program, while the control group received no intervention. Questionnaires were re-administered to both groups after the intervention and again two months later for follow-up.

The statistical population consisted of all women diagnosed with breast cancer in Bandar Abbas in 2024. Based on Cohen's table, using $\alpha = 0.05$, power = 0.80, and effect size = 0.4, a sample size of 15 participants per group was deemed sufficient. With over-sampling for potential dropouts, 30 eligible patients were recruited through purposive sampling and randomly assigned to experimental and control groups (15 in each). Patients in the experimental group participated in a 10-session, 90-minute weekly program over 8 weeks, which included the mindfulness-based psychological coping skills training. The control group received no intervention during the same period. Inclusion criteria were informed consent to participate, age between 20–45 years, No acute psychological or psychiatric disorders (self-reported) and minimum education level: secondary school diploma. Exclusion criteria were non-cooperation

or withdrawal, missing more than two sessions, incomplete questionnaire data and withdrawal of consent.

Instrument

Self-Efficacy Questionnaire: Developed by Sherer & Adams, (1983), this 23-item scale measures general and social self-efficacy (17 items for general, 6 for social situations) using a 5-point Likert scale. Sherer & Adams, 1983 reported an internal consistency (Cronbach’s

alpha) of 0.86. Construct and concurrent validity were supported through correlations with variables such as optimistic attribution style ($r = 0.49$), challenge perception under stress ($r = 0.45$), and self-regulation ($r = 0.58$). It also showed significant correlations with depression ($r = -0.52$), anxiety ($r = -0.60$), and self-esteem ($r = 0.30$). In the current study, Cronbach’s alpha was 0.91, indicating high reliability.

Table 1

Summary of the Mindfulness-Based Coping Skills Training Protocol

Session	Topic	Summary	Homework
1	Understanding Psychological, Social, and Physical Impacts of Cancer	Discussion of emotional responses (e.g., fear, anxiety, depression), physical effects of illness/treatment, role changes, and isolation	Daily log of thoughts/feelings; record concerns
2	Psychosomatic Effects on Daily Functioning	Effects such as fatigue, sleep issues, sexual dysfunction, and cognitive changes	Track physical and emotional symptoms
3	Cultural and Economic Barriers	Explore personal and family beliefs, financial concerns, and treatment barriers	Identify challenges and suggest solutions
4	Facilitators and Barriers to Coping	Role of family and support groups, emotional resistance, lack of info	Interview a support person; list strengths/weaknesses in coping
5	Introduction to Mindfulness	Principles of mindfulness and benefits for stress reduction	Practice 5-minute mindful breathing daily
6	Body Scan Meditation	Use mindfulness to cope with pain and anxiety	10-minute body scan; journal observations
7	Adaptive vs. Maladaptive Behaviors	Recognizing helpful/unhelpful coping styles	Identify one maladaptive behavior; plan replacement
8	Stress Management with Mindfulness	Managing intrusive thoughts and emotional reactivity	Practice 10-minute daily meditation; note stress levels
9	Social Support and Communication	Enhancing communication to gain support	Talk to a family member about emotional needs
10	Review and Maintenance Plan	Consolidation of skills, quality-of-life assessment	Create a personal continuation plan

Data Analysis

To test the significance of the research question, data were analyzed at both descriptive and inferential levels. Descriptive statistics included frequency, percentage, mean, and standard deviation. Inferential statistics included: Shapiro–Wilk test for normality, Levene’s test for homogeneity of variances, Mauchly’s test for sphericity, Repeated Measures ANOVA to assess intervention effects over time and Bonferroni post-hoc test to examine pairwise differences across time points.

Findings and Results

The mean age of participants in both experimental and control groups ranged from 27 to 41 years. The significance level for the age variable was greater than 0.05, indicating no significant difference between the two groups in terms of age; thus, the groups were considered homogeneous. Similarly, no significant differences were observed between the groups in terms of educational level or employment status, confirming baseline equivalence between the two groups.

Table 2

Means and Standard Deviations of Psychological Self-Efficacy in Pretest, Posttest, and Follow-up

Variable	Group	Pretest (M ± SD)	Posttest (M ± SD)	Follow-up (M ± SD)
Psychological Self-Efficacy	Intervention	37.9 ± 6.85	53.5 ± 6.03	52.4 ± 6.12
	Control	38.9 ± 6.90	40.0 ± 6.70	39.2 ± 6.60

Table 2 shows that pretest scores were similar across groups. However, the intervention group displayed

notable increases in self-efficacy at posttest and follow-up compared to the control group.

Table 3

Normality Test (Shapiro-Wilk)

Variable	Group	Pretest (p)	Posttest (p)	Follow-up (p)
Psychological Self-Efficacy	Intervention	0.052	0.271	0.210
	Control	0.428	0.861	0.267

The Shapiro-Wilk test indicated that all distributions were normal ($p > 0.05$), validating the assumptions for parametric analysis.

Table 4

Levene's Test for Equality of Variances

Time Point	F	df1	df2	p-value
Pretest	0.06	1	28	0.800
Posttest	0.009	1	28	0.927
Follow-up	0.008	1	28	0.928

No significant difference in variances was found ($p > 0.05$), supporting the assumption of homogeneity of variances.

Table 5

Multivariate Analysis of Variance (MANOVA)

Test	Value	F	df1	df2	p-value	Eta ²
Pillai's Trace	0.860	82.6	2	27	0.001	0.860
Wilks' Lambda	0.140	82.6	2	27	0.001	0.860
Hotelling's Trace	6.12	82.6	2	27	0.001	0.860
Roy's Largest Root	6.12	82.6	2	27	0.001	0.860

Results from Wilks' Lambda confirmed a significant multivariate effect ($p < 0.01$), suggesting a statistically significant difference between the experimental and control groups in terms of psychological self-efficacy

across time points. The effect size (Eta² = 0.860) indicates that 86% of the variance in outcomes was attributable to the intervention.

Table 6

Repeated Measures ANOVA (Greenhouse-Geisser Corrected)

Source	SS	df	MS	F	p-value	Eta ²
Between Subjects						
Group	372.1	1	372.1	6.06	0.020	0.178
Error	1717.06	28	61.3			
Within Subjects						
Time	304.2	1.07	284.2	180.9	0.001	0.866
Time × Group	274.06	1.07	256.07	163.04	0.001	0.853
Error (Time)	47.06	29.9	1.57			

The main effect of time and the interaction effect between time and group were both significant ($p < 0.01$), indicating that self-efficacy scores changed significantly

over time and that the intervention had a differential effect on the experimental group.

Table 7

Pairwise Comparisons (Bonferroni Post-Hoc)

Comparison	SS	df	MS	F	p-value	Eta ²
Time (Pre vs. Post)	228.1	1	228.1	174.8	0.001	0.862
Time (Post vs. Follow-up)	76.05	1	76.05	202.1	0.001	0.878
Time × Group Interaction						
Pre vs. Post	212.8	1	212.8	163.1	0.001	0.853
Post vs. Follow-up	61.2	1	61.2	162.8	0.001	0.853

Pairwise comparisons confirmed that self-efficacy significantly increased from pretest to posttest and was sustained at follow-up in the intervention group. The

Discussion and Conclusion

The results of this study demonstrated that the mindfulness-based psychological coping skills training significantly improved psychological self-efficacy among women with breast cancer in Bandar Abbas. Both national and international studies support the effectiveness of mindfulness-based interventions and coping skills training in enhancing self-efficacy. For instance, (Esmailmotlagh et al., 2018) found that coping skills training significantly improved self-efficacy and reduced aggression among adolescents, while (Asghari et al., 2024) reported that mindfulness training enhanced self-efficacy and reduced fear of negative evaluation among female student-athletes. Internationally, (Wang et al., 2024) acknowledged the efficacy of online mindfulness programs in improving the psychological well-being and self-efficacy of cancer (Li et al., 2024) emphasized the role of brief mindfulness-based training in increasing distress tolerance and self-efficacy.

Psychological self-efficacy is one of the key determinants of quality of life for women with breast cancer. The belief in one's ability to manage emotions, thoughts, and behaviors in the face of chronic illness is particularly important for individuals confronting the unpredictable and often distressing nature of breast cancer. These patients frequently experience overwhelming negative emotions, uncertainty about the future, and perceived loss of control. Interventions that directly target psychological self-efficacy and empower

interaction effects also showed that changes in self-efficacy over time were significantly greater in the intervention group than in the control group.

women to regain a sense of agency, confidence, and control are therefore essential. The current training program was designed precisely to enhance such core aspects of psychological self-efficacy (Daneshvar et al., 2020).

According to Bandura's theory, self-efficacy is a fundamental construct for coping with stress and chronic illness. Individuals with higher self-efficacy are more likely to view challenges as opportunities for growth, exhibit proactive behavior, and reframe their illness narrative positively (Al-Zubaidi et al., 2022). The present intervention fostered these outcomes by increasing participants' awareness of negative thoughts and emotions and equipping them with effective cognitive-behavioral and mindfulness-based coping strategies. The resulting improvement in self-efficacy not only aids in stress management but also reduces rumination, modifies dysfunctional beliefs, and strengthens psychological resilience (Davoudi-Monfared et al., 2023).

Furthermore, the intervention emphasized practical mindfulness practices, such as body scanning, breathing exercises, and nonjudgmental awareness of thoughts. These practices helped participants cultivate a receptive and non-reactive stance toward their inner experiences, thereby increasing emotional self-regulation and reinforcing their sense of efficacy (Daneshvar et al., 2020). Actively monitoring one's emotions and accepting them as natural phenomena allows patients to avoid avoidant or maladaptive behaviors and to trust in their ability to cope effectively (Shalikari et al., 2023).

Multiple studies have shown that enhanced self-efficacy contributes not only to improved clinical outcomes, such as reduced depression and anxiety, but also to better social and interpersonal functioning. Women who develop higher levels of self-efficacy through such interventions are more likely to communicate their needs, seek social support effectively, and build adaptive coping mechanisms. Self-efficacy also affects patients' biological adjustment to treatment side effects. For example, (Salahshouri et al., 2018) found that cancer and diabetic patients with high self-efficacy adhered more strongly to medical regimens and healthy behaviors. The multifaceted nature of the present training package—incorporating mindfulness, active coping strategies, problem-solving, cognitive restructuring, and support-seeking skills—enabled participants to develop competence in managing unknown or ambiguous situations (Al-Zubaidi et al., 2022). Additionally, the group format fostered observational learning and a sense of collective efficacy.

The "nonjudgmental acceptance" element of mindfulness was particularly impactful. Studies such as those by (Jamshidi, 2024) and (Haller et al., 2017) suggest that cultivating acceptance reduces self-criticism, fosters self-compassion, and increases confidence in one's competencies. This shift in focus from personal deficiencies to personal strengths helps breast cancer patients reconstruct a more compassionate and empowered self-image. The structured, progressive nature of the training supported long-term retention of self-efficacy gains. Comparative research (Chang et al., 2023; Williams et al., 2024) indicates that continuous mindfulness practice leads to more enduring psychological benefits than brief or irregular interventions. Empowering patients to actively set personal health goals and participate in treatment decisions also reflects the broader benefits of enhanced self-efficacy (Rahmanian et al., 2021).

In the study by Shalikari et al., (2023)), mindfulness-based interventions improved problem-focused coping behaviors and psychological self-efficacy, enabling women to respond more confidently to illness-related distress. These findings affirm that self-efficacy influences not only cognitive outcomes but also emotional and behavioral adaptation. From a cultural perspective, Iranian women with breast cancer may face specific challenges such as illness-related stigma, familial

and social role expectations, or anxiety about the future. The mindfulness-based training encouraged internal resource mobilization and acceptance, thereby enhancing culturally embedded self-efficacy. Studies have shown that quality of life in cancer patients is highly correlated with psychological self-efficacy, which protects against helplessness and promotes active engagement across all stages of illness (Davoudi-Monfared et al., 2023)

At a biopsychosocial level, mindfulness and increased self-efficacy reduce not only psychological symptoms such as anxiety and depression but also physiological stress indicators, such as serum cortisol levels. Daneshvar et al., (2020) reported a significant reduction in cortisol and improvements in mood following a mindfulness-based intervention, effects that are difficult to achieve without boosting self-efficacy. Lastly, the sustained and developmental effects of mindfulness-based training were evident. Women with a more self-efficacious mindset continued to cope more adaptively even after the intervention ended, managing fears of recurrence and long-term treatment side effects with greater confidence (Oner Cengiz et al., 2023).

This study focused solely on women with breast cancer in Bandar Abbas during 2024, which may limit the generalizability of findings. The exclusion criterion of "absence of acute psychological disorders" was based solely on self-report, potentially leading to selection bias. Some participants withdrew due to health conditions or cultural stigmas, and incomplete questionnaire responses or absences resulted in sample reduction. The convenience sampling method may have overrepresented participants with stronger family support or better socioeconomic status. Future studies should expand to diverse geographic, ethnic, and cultural groups to assess the broader applicability of the intervention. Multi-center studies comparing urban and rural populations or culturally distinct provinces could provide valuable insights into how local contexts shape treatment effectiveness. Random sampling, standardized screening tools, and structured clinical interviews conducted by trained psychologists can reduce bias and improve sample validity. Moreover, stratified comparisons (e.g., by socioeconomic status, motivation, or family support) could clarify moderating factors in intervention outcomes. Longitudinal research exploring effects on resilience, coping styles, and physical health adherence would further enrich the field.

Acknowledgments

The authors express their gratitude and appreciation to all participants.

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. Ethical considerations in this study were that participation was entirely optional.

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 contribute to this study.

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