The Relationship between Mindfulness and Resilience with Psychological Adaptation: The Mediating Role of Locus of Control in Women with Cancer

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ABSTRACT

Objective: This article examines the relationship between mindfulness and resilience with psychological adaptation in women diagnosed with cancer. The objective of this study is to determine the mediating role of Locus of Control in this relationship.

Methods and Materials: The research method used was descriptive correlational modeling (structural equations). Participants in this study were women with cancer visiting all treatment centers (hospitals and private and public clinics) in Tehran, among whom 206 individuals were selected through convenience sampling.

Findings: The results of statistical analyses indicated that Locus of Control significantly mediates the relationship between mindfulness and resilience with psychological adaptation.

Conclusion: These findings can assist in designing intervention programs that support women with cancer in enhancing their mindfulness and resilience, thereby aiding in improving their psychological adaptation. It is recommended that future studies be conducted on larger and more diverse samples to gain a deeper understanding of these phenomena. Additionally, examining the role of other mediating factors such as social support and spirituality may help complete the overall picture.

Keywords: Resilience, Mindfulness, Psychological Adaptation, Locus of Control, Cancer.

1. Introduction

Breast cancer is recognized as the most common cancer among Iranian and global women (Swain et al., 2023). In Iran, breast cancer has the highest incidence rate with 312 cases per 100,000 individuals (Ghodrati et al., 2024), while globally, breast cancer is one of the four main cancers diagnosed among women (Kunkler Ian et al., 2023). These statistics underscore the importance of focusing on women's health and the necessity of preventive measures, early diagnosis, and effective treatment (Britt et al., 2020). Cancer is seen as a major health issue of the century, and its growing

prevalence over the past two decades and its adverse effects on the physical, psychological, social, and economic aspects of human life are more concerning than ever to experts (Sanford et al., 2019). However, global efforts to reduce the cancer burden continue, including extensive research and awareness programs aimed at improving treatment outcomes and the quality of life of patients (Wilkinson & Gathani, 2022).

In today's turbulent world, where life is often accompanied by various stresses and pressures, finding ways to maintain balance and psychological adaptation is crucial (Nilsen et al., 2021). Mindfulness, defined as the presence of mind and conscious attention to momentary experiences without judgment, is recognized as one of the effective approaches in this area (Cheng et al., 2020). This article explores the relationship between mindfulness and psychological adaptation and aims to show how mindfulness can help individuals cope with life's challenges more constructively (De Vincenzo et al., 2022). Psychological adaptation refers to an individual's ability to cope with problems, maintain emotional and psychological balance, and continue living despite obstacles (Jassim et al., 2023). This concept, which is the focus of positive psychology and evidence-based therapies, reflects the human capacity for growth and development even under difficult conditions (Martino et al., 2021).

Mindfulness, as a psychological skill, can be impactful in managing stress and improving individuals' quality of life (Wang et al., 2022). Research has shown that mindfulness can help reduce pain catastrophizing, psychological distress, and rumination in women with cancer (Liu et al., 2020). Mindfulness is a state of awareness that plays a role in monitoring and moderating other personal experiences and contributes to the improvement of cognitive and emotional self-regulation (Segal et al., 2018). Moreover, mindfulness can mediate the improvement of psychological well-being through the use of positive cognitive-emotional regulation strategies (Patel et al., 2020).

Resilience, referring to an individual's ability to withstand difficult conditions and recover balance after psychological stresses and strains, is recognized as one of the most important factors in the process of adaptation (Larsen, 2022). Psychological adaptation also refers to an individual's ability to maintain emotional and psychological balance in the face of challenges and pressures, and it signifies the human capacity for growth and development even under harsh conditions (Swain et al., 2023). Resilience, a key human capability, facilitates effective adaptation to risk factors and

signifies physical resistance and self-driven recovery ability to reestablish emotional equilibrium in stressful situations, referring to qualities that contribute to the speed and extent of recovery after stress exposure (Hsu et al., 2021). The concept of resilience in relation to stress sources represents an individual's intrinsic ability to respond, endure, and remain natural despite the presence of stresses (Mohlin et al., 2021). Resilience focuses on a specific subset of processes believed to enhance adaptation and well-being in the face of significant adversities (Lee et al., 2013).

In contemporary medical research, the psychological adaptation of patients with chronic and serious illnesses, particularly cancer, has become a primary focus of research (Omar et al., 2020). Mindfulness, defined as the presence of mind and conscious attention to momentary experiences without judgment, can act as an effective coping strategy in dealing with disease-related stresses (Gupta et al., 2020). This article examines the relationship between mindfulness and psychological adaptation in women with cancer and analyzes the mediating role of Locus of Control in this relationship (Thapa et al., 2021). Locus of Control, which refers to an individual's beliefs about control over life events, can be divided into internal and external. Internal Locus of Control refers to the belief that an individual has the ability to influence events and their outcomes, while External Locus of Control refers to the belief in external forces and factors as the main determinants of events (Toscano et al., 2020).

This article explores how resilience and mindfulness affect psychological adaptation in women with cancer. Given that experiencing cancer can be considered a psychological incident, this research aims to provide a better understanding of the psychological processes that women undergo during and after cancer treatment. We particularly seek to understand how resilience and mindfulness abilities can help women grow and develop from their cancer experiences. This study can help us find ways to better support cancer patients on their recovery path. We aim to better understand the internal and external processes that help these women turn their challenging experiences into opportunities for personal growth and development. Additionally, we are interested in understanding how resilience and mindfulness can act as predictors of psychological and behavioral responses to illness and how these styles can be used in designing supportive and therapeutic programs.

2. Methods and Materials

2.1. Study Design and Participants

The research method employed was descriptive correlational modeling (structural equations). Participants in this study were women diagnosed with breast cancer who visited all treatment centers (hospitals, private and public clinics) in Tehran, from which 206 individuals were randomly selected. Inclusion criteria included being over 18 years old, having experienced psychological or physical injuries during childhood, and the ability to understand and respond to questionnaires. Exclusion criteria included severe cognitive disorders that prevented understanding of the questionnaires and experiencing any severe psychological or physical injury during the past six months. Ethical considerations involved ensuring informed consent, the possibility of withdrawing from the research at any stage, maintaining the anonymity and confidentiality of participant information, ensuring that the information was not used in a manner that could harm the participants, and providing full information about the research objectives and the use of the results.

2.2. Measures

2.2.1. Mindfulness

Developed by Baer et al., this instrument consists of 39 items across five subscales: Observing, Describing, Acting with Awareness, Non-judging of Inner Experience, and Non-reactivity to Inner Experience. Respondents answer on a five-point Likert scale ranging from "Very Rarely True" (1) to "Always True" (5). In the initial study by Baer et al. (2006), the Cronbach's alpha reliability coefficient ranged from 0.75 to 0.91 for the different subscales, and construct validity was confirmed through exploratory factor analysis. In Iran, this questionnaire was standardized by Tamanai Far et al. (2016), showing that the test-retest reliability in a sample of 58 individuals (average age 23.57, SD 4.6) ranged from 0.76 to 0.86 for the five-factor mindfulness scales, indicating the questionnaire is a valid tool for use in student samples (Tamannaeifar et al., 2019).

2.2.2. Resilience

Developed by Connor and Davidson (2003) from research literature between 1979 and 1991, this questionnaire has 25 items aimed at measuring resilience levels in individuals. It uses a Likert scale, and the total score ranges from 0 to 100, with higher scores indicating greater resilience. A score above 50 suggests a resilient individual.

Besharat et al. (2007) reported the reliability and validity of this scale at 0.89. Ahangarzadeh Rezaei and Rasouli (2015) found a Cronbach's alpha reliability of 0.82 (Darbani & Parsakia, 2023).

2.2.3. Psychological Adaptation

The Bell Adjustment Inventory (1961) was used to assess psychological adaptation. This questionnaire includes 160 questions across five dimensions (32 questions each) related to adaptation in the home, health, emotional, occupational, and social domains. Questions are based on a five-point Likert scale (from strongly agree to strongly disagree), where a higher score indicates lower adaptation. Reliability in Bell's study (1961) was identified as 0.94, and in this study, it was determined to be 0.82. The questionnaire was standardized in Iran by Ghasemi (1998) with a reported reliability coefficient of 0.89.

2.2.4. Locus of Control

Developed by Rotter in 1966, this questionnaire contains 29 items. Rotter crafted 23 of these items with a specific purpose to clarify individuals' expectations about their locus of control, while questions 24, 19, 14, 8, 1, and 28 are designed to distract from the main objective of the test. Scoring is based on the total of marked responses. Only respondents scoring 9 or more are considered to have an external locus of control, while those scoring less are considered to have an internal locus of control. The scale does not have a total score. Rotter et al. (1972) reported initial reliability coefficients using split-half method (0.65), Kuder-Richardson method (0.73), and test-retest method over one month (0.72). Discriminant validity of Rotter's Internal-External Locus of Control Scale was determined based on its correlation with the Marlowe-Crowne Social Desirability Scale and varied between 0.16 and 0.41 in a diverse sample including university students and prisoners in Ohio. Ahmadvand et al. (2012) reported test-retest reliability coefficients ranging from 0.57 to 0.84 (Afrooz et al., 2022).

2.3. Data analysis

Data are analyzed using the AMOS software. Structural Equation Modeling (SEM) is utilized to investigate the relationships between independent variables, dependent variables, and mediating variables.

3. Findings and Results

This study involved 206 women aged between 22 and 67 years, with a mean and standard deviation of age being 43.42 ± 7.50. Table 1 presents the means, standard deviations, and correlation coefficients between the variables of the study.

Table 1

Means, Standard Deviation, Skewness, Kurtosis, and Correlation Coefficients of Study Variables

Variables	1	2	3	4
1. Locus of Control	-			
2. Psychological Adaptation	.395*	-		
3. Resilience	.447*	.565*	-	
4. Mindfulness	.286*	.524*	.463*	-
Mean	15.06	196.39	49.11	78.42
Standard Deviation	3.23	34.30	9.21	16.24
Skewness	-.290	-.252	-.365	-.171
Kurtosis	-.677	-.109	-.876	-.825

*p<0.01

The proportion of missing values to complete data in each item was less than 5%, estimated using the Expectation Maximization (EM) method. According to the results in Table 1, the skewness and kurtosis values of the research variables were within the ±2 range, indicating that the distribution of data related to the research variables is normal. Thus, the assumption of normality for the research variables is established.

The fit of the structural model with the collected data was tested using Structural Equation Modeling (SEM). The structural model hypothesized that there is a relationship between resilience and mindfulness with psychological adaptation in individuals with cancer, considering the mediating role of Locus of Control. As expected, given the equality of observed variables, latent variables, and degrees of freedom in measurement and structural models, similar fit indices were obtained for the structural model, concluding that the structural model fits the collected data well.

Table 2

Model Fit Indices

Fit Indices	Measurement Model	Cut-off Point
Chi-square	25.16	-
Degrees of Freedom	4	-
Chi-square/df	1.16	< 3
GFI	.956	> .90
AGFI	.912	> .85
CFI	.955	> .90
RMSEA	.039	< .08

Table 2 demonstrates that all fit indices support the satisfactory fit of the measurement model with the collected data (Chi-square/df = 1.16, CFI = .955, GFI = .956, AGFI = .912, RMSEA = .039).

Table 3

Total, Direct, and Indirect Path Coefficients in the Structural Model

Path	B	S.E.	β	t	P
Resilience → Psychological Adaptation	.158	.072	.183	6.55	.006
Mindfulness → Psychological Adaptation	.196	.052	.207	7.33	.001
Direct Path Resilience → Locus of Control	-.286	.132	-.317	-9.44	.001
Total Path Mindfulness → Locus of Control	-.249	.120	-.375	-10.11	.001
Indirect Path Resilience → Psychological Adaptation	-.395	.157	-.452	-17.99	.001
Indirect Path Mindfulness → Psychological Adaptation	-.156	.037	-.445	-16.15	.001

Table 3 shows that on one hand, the direct path coefficient between resilience and psychological adaptation is positive and significant at the .05 level (p < .05, β = .183). On the other hand, the path coefficient between mindfulness and psychological adaptation is positive and significant at the .01 level (p < .01, β = .207). Additionally, the direct path coefficient between resilience and Locus of Control is negative and significant at the .05 level (p < .05, β = -.317), and between mindfulness and Locus of Control is negative and significant at the .01 level (p < .01, β = -.375). Table 3 also shows that the indirect path coefficient between resilience and psychological adaptation is negative and significant at the .01 level (p < .01, β = -.452), and between mindfulness and psychological adaptation is negative and significant at the .01 level (p < .01, β = -.445). Thus, it was concluded that Locus of Control significantly mediates the relationship between resilience, mindfulness, and psychological adaptation.

4. Discussion and Conclusion

Psychological adaptation in women with cancer is one of the most crucial factors in the recovery process and quality of life. This concept refers to the ability to maintain emotional and psychological balance in the face of challenges and stress and demonstrates the human capacity for growth and development even under difficult circumstances (Kunkler Ian et al., 2023). Enhancing mindfulness leads to increased psychological well-being; indeed, mindful individuals are better at recognizing, managing, and resolving problems (Hollis-Walker & Colosimo, 2011). Mindfulness reduces negative psychological symptoms, increasing life satisfaction, happiness, optimism, and psychological adaptation. Locus of Control refers to individual beliefs about control over life events and can be categorized into internal and external. An internal Locus of Control suggests that an individual believes they can influence events and their outcomes, whereas an external Locus of Control relates to the belief in external forces and factors as the main determinants of events (Thapa et al., 2021). In the context of cancer, psychological adaptation can be influenced by various factors, including disease severity, quality of received care, social support, and Locus of Control. Locus of Control acts as a mediating factor and can significantly affect how an individual copes with the disease and, consequently, their psychological adaptation. Women with a higher internal Locus of Control may feel more empowered in dealing with

the disease, thus experiencing higher levels of psychological adaptation (Britt et al., 2020). This sense of empowerment can help them cope more effectively with the stresses of diagnosis and treatment and use their difficult experiences for personal growth and development. Conversely, women with a higher external Locus of Control may feel less able to control their circumstances and, as a result, may have lower psychological adaptation. This may lead to increased stress and a reduced ability to cope with the disease; therefore, understanding the role of Locus of Control in psychological adaptation can aid in designing intervention programs that help women with cancer strengthen internal resources and improve their quality of life.

Resilience is a key concept in the pathway to recovery and dealing with serious diseases like cancer. Resilience means the strength and ability of an individual to cope with difficult conditions and return to normal after experiencing harms and psychological pressures. This trait helps individuals not only to overcome crises but also to use their challenging experiences for personal growth and development. Resilience enables individuals to maintain psychological homeostasis in risky situations. Individuals with high resilience maintain their psychological health in stressful conditions and show higher psychological adaptation (Oprins et al., 2018). In the context of cancer, resilience can help women effectively cope with the stresses of diagnosis and treatment. Locus of Control acts as a mediating factor in this relationship. Women with a higher internal Locus of Control may feel more empowered to deal with the disease, potentially experiencing higher levels of psychological adaptation. Meanwhile, women with a higher external Locus of Control may feel less capable of controlling their circumstances, potentially leading to lower psychological adaptation (Toscano et al., 2020); thus, understanding how resilience and Locus of Control can impact psychological adaptation can assist in designing intervention programs that help women with cancer cope with the disease and improve their quality of life.

5. Limitations & Suggestions

The limitations of this study include the following: The present research was conducted with non-random samples, which may not reflect a sufficient diversity of patient experiences. Factors such as age, gender, culture, and socioeconomic status can impact resilience and psychological adaptation and should be considered in research. Besides resilience, other variables such as social

support and spirituality can also play a role in psychological adaptation. Longitudinal studies can help better understand changes in resilience, mindfulness, and psychological adaptation over time. To enhance the validity and generalizability of the results, the use of larger and more diverse samples is essential. Investigating the role of other mediating factors such as social support and spirituality in the relationship between resilience, mindfulness, and psychological adaptation is recommended. Comparative cultural studies to understand the impact of culture on resilience and psychological adaptation are suggested. These recommendations can help researchers gain a deeper understanding of the complexities involved in the relationship between resilience, mindfulness, and psychological adaptation, and achieve results that have greater practical applicability for individuals with cancer.

Acknowledgments

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.

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Authors' Contributions

All authors equally contributed in this article.

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