

The Relationship Between Resilience and Mindfulness with Post-Traumatic Growth: The Mediating Role of Coping Styles in Women with Cancer

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ABSTRACT

Objective: Cancer, as a major health challenge globally, affects millions of lives. The purpose of this study was to investigate the relationship between resilience and mindfulness with post-traumatic growth in women with cancer, considering the mediating role of coping styles.

Methods and Materials: The research method was descriptive correlational modeling (structural equation modeling). Participants in this study were women with breast cancer visiting all treatment centers (hospitals, and private and public clinics) in Tehran, among whom 206 were selected conveniently. Data were collected using the Mindfulness Questionnaire, the Connor-Davidson Resilience Scale, the Coping Styles Questionnaire, and the Post-Traumatic Growth Inventory. Data were analyzed using Pearson correlation coefficient, structural equation modeling, and SPSS 22 and AMOS 22 software.

Findings: Statistical analyses have shown that coping styles significantly mediate the relationship between resilience and mindfulness with post-traumatic growth. Specifically, problem-focused coping styles were positively associated with post-traumatic growth, while emotion-focused coping styles showed a negative relationship ($p < .001$).

Conclusion: These findings can contribute to the design of intervention programs that assist cancer patients in enhancing resilience and mindfulness, thereby aiding them in experiencing post-traumatic growth. Future studies might explore the role of other mediating factors such as social support and spirituality to complete the overall picture.

Keywords: Resilience, Mindfulness, Post-Traumatic Growth, Coping Styles, Cancer.

1. Introduction

Cancer, recognized globally as a significant health challenge, impacts millions of lives (Katsura et al., 2022). In Iran, the prevalence of cancer in women is below the global average, with an incidence rate of 128 cases per 100,000 people (Aghdam et al., 2022). Globally, the cancer incidence rate in women has been reported as 198 per 100,000 (Devericks et al., 2022). These figures underscore the importance of focusing on women's health and the need for preventive measures, early detection, and effective treatment (Tung & Garber, 2022). Cancer carries significant psychological burdens, ranging from adjustment problems to anxiety, depression, or even post-traumatic stress disorder (Mitchell et al., 2013). As the number of cancer survivors increases, there is a growing focus on examining the needs and experiences of these survivors (Miller et al., 2019). 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 (Balkenende et al., 2022).

In the realm of psychology, numerous studies have been conducted on the impact of adverse events and disasters, such as cancer, which primarily focused on identifying the negative effects of the illness (Romeo et al., 2020). However, negative effects only explain one dimension of the response of affected individuals. Many people may experience post-traumatic growth following trauma (such as cancer) (Wan et al., 2022). Post-traumatic growth has been studied by Calhoun and Tedeschi (Fu et al., 2022; Tedeschi & Calhoun, 1996, 2004). Post-traumatic growth, recognized as a positive experience following life-altering adverse events, can play a significant role in the lives of women with cancer (Choi et al., 2022). Research indicates that many women report positive changes in their perspectives, values, and priorities after experiencing cancer (Liu et al., 2020). These changes can include an increased appreciation of life, enhanced social and family relationships, and the development of new meaning and purpose. Our study seeks to understand how these positive changes can serve as a source of strength in combating the disease and improving quality of life (Shi et al., 2022).

Given that cancer is a physical illness, it is crucial to also consider its psychological factors, one of which is resilience (Shi et al., 2022; Zhou et al., 2022). Resilience, one of the most important human capabilities, enables effective adaptation to risk factors and is indicative of both physical resistance and the capacity for self-initiated recovery and

emotional balance restoration in stressful situations (Golparvar & Parsakia, 2023; Hsu et al., 2021; Parsakia et al., 2024). The concept of resilience in relation to stressors represents an individual's intrinsic ability to respond, endure, and maintain normalcy despite stress (Mohlin et al., 2021). Resilience focuses on a specific subset of developmental processes thought to enhance adaptation and well-being in the face of significant adversities. Recently, resilience has been defined as a developmental process (Lee et al., 2013). Findings from the study by Park et al. (2018) indicated that resilience is a highly effective factor in fostering post-traumatic growth (Park et al., 2018).

One of the components associated with post-traumatic growth among cancer patients is mindfulness. Mindfulness, as a psychological skill, can significantly impact stress management and improve individuals' quality of life. Mindfulness is a state of awareness that plays a role in monitoring and modulating other personal experiences and contributes to the improvement of cognitive-behavioral self-regulation (Segal et al., 2018). Mindfulness involves an awareness that emerges through focused attention, in the present moment, and without judgment of things as they are (Burgess et al., 2021). The study by Lianchao and Thingting (202) showed that mindfulness is one of the important predictors of post-traumatic growth (Lianchao & Tingting, 2020).

On the other hand, coping styles, as strategies that individuals employ to manage stress and challenges arising from serious illnesses like cancer, hold particular importance (Wan et al., 2022). Behaviors and thoughts that individuals use to adjust to external and internal pressures of distressing events are known as coping strategies. Coping styles are described as ongoing behavioral and cognitive efforts to manage external and internal demands assessed as exceeding personal resources (Lazarus & Folkman, 1984). Research has shown that problem-focused coping styles can positively predict self-acceptance, personal growth, and mastery over the environment (Cho et al., 2020), although some studies indicate a positive relationship between emotion-focused coping styles and post-traumatic growth (Acar et al., 2021). Further studies also suggest that there is a significant positive relationship between emotional intelligence and problem-focused coping styles in cancer patients (Zhou et al., 2022). Understanding how to strengthen effective coping styles can assist in designing more effective supportive and therapeutic programs for these patients (Hsu et al., 2021).

This article examines how resilience and mindfulness affect post-traumatic growth in women with cancer. Given

that experiencing cancer can be considered a psychological trauma, 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 can help women develop and grow from their cancer experiences. This study could help us find ways to better support cancer patients on their recovery path. We aim to better understand the internal and external processes that enable these women to find opportunities for personal growth and development from their challenging experiences. Additionally, we aim to understand how resilience and mindfulness can act as predictors of psychological and behavioral responses to illness and how these styles can be utilized in designing effective supportive and therapeutic programs.

2. Methods and Materials

2.1. Study design and Participant

The research method was descriptive correlational modeling (structural equation modeling). Participants in this study were women with breast cancer attending all treatment centers (hospitals, and private and public clinics) in Tehran, among which 206 were randomly selected. Inclusion criteria included being over 18 years old, having experienced psychological or physical trauma 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 in the last six months. Ethical considerations included adherence to the principle of informed consent, the option to withdraw from the research at any stage, maintaining the anonymity and confidentiality of participant information, ensuring that data was not used in a manner that could harm the participants, and providing full information about the purpose of the research and how the results would be used.

2.2. Measures

2.2.1. Mindfulness

Developed by Baer et al., it contains 39 questions and five subscales: Observing, Describing, Acting with Awareness, Non-judging of Inner Experience, and Non-reactivity to Inner Experience. Respondents rate the questions on a five-point Likert scale from "very rarely true" (never) (score 1) to "always true" (score 5). In the initial study by Baer et al. (2006), Cronbach's alpha ranged from .75 for Non-reactivity

to .91 for Describing, and construct validity was confirmed through exploratory factor analysis. In the study by Ahmadwand et al. (2012), the test-retest reliability coefficients ranged from .57 to .84 (Sabouri & Mansouri, 2022).

2.2.2. Resilience

Created by Connor and Davidson (2003) after reviewing resilience literature from 1979 to 1991, this questionnaire has 25 items aimed at measuring resilience levels in individuals. It utilizes a Likert-type scale, and the total score can range from 0 to 100, with higher scores indicating greater resilience. A cutoff point is set at a score of 50, where scores above 50 indicate resilient individuals. In research by Besharat et al. (2007), the validity and reliability of this questionnaire were found to be .89. In the study by Ahangarzadeh Rezaei and Rasouli (2015), Cronbach's alpha was .82 (Amani et al., 2022).

2.2.3. Post-Traumatic Growth

Developed by Tedeschi & Calhoun in 1996, this questionnaire consists of 21 items and five components: New Possibilities, Relating to Others, Personal Strength, Appreciation of Life, and Spiritual Change, scored on a six-point Likert scale. Scores range from 0 ("I do not attribute this change to the stressful event") to 5 ("I attribute this change very much to the stressful event"), with a possible range of 0 to 105. Higher scores indicate more post-traumatic growth. In Tedeschi and Calhoun's (1996) study, Cronbach's alpha for the overall scale was .90, and for the subscales, it ranged from .67 to .85. In Iran, Seydmahmoudi, Rahimi, and Mohammadi Jaber (2013) reported a Cronbach's alpha of .92 (Kiani et al., 2020).

2.2.4. Coping Strategies

Developed by Endler and Parker (1994), this shortened version of the original scale created in 1990 comprises 48 items covering three main coping domains: task-oriented, emotion-oriented, and avoidance coping, which may involve turning to others or engaging in a new activity. The shortened version contains 21 items with 7 items each for task-oriented, emotion-oriented, and avoidance strategies, rated on a five-point Likert scale from 1 ("very little") to 5 ("very much"). The maximum score for each method is 35, and the minimum is 7. Research supports the validity and reliability of this instrument. In Iran, a study by Mohebi,

Shakouri, and Khodayi (2020) also confirmed the factorial structure and internal consistency of the three coping styles, with Cronbach's alphas of .78, .79, and .79 respectively (Mohebi et al., 2020).

2.3. Data Analysis

Data are analyzed using AMOS software, and structural equation modeling (SEM) is employed to examine the relationships among independent variables, dependent variables, and mediating variables.

3. Findings and Results

Table 1

Descriptive Characteristics of Study Variables

| Variables | Post-Traumatic Growth | Resilience | Mindfulness | Emotion-Focused Coping | Problem-Focused Coping |
|-----------|-----------------------|------------|-------------|------------------------|------------------------|
| Mean | 22.47 | 24.55 | 25.57 | 53.03 | 53.59 |
| SD | 6.78 | 7.30 | 8.58 | 9.84 | 9.33 |
| Skewness | -0.365 | -0.171 | -0.290 | -0.252 | -0.549 |
| Kurtosis | -0.876 | -0.825 | -0.677 | -1.109 | -1.230 |

In this research, the ratio of missing values to complete data for each item was less than 5%, estimated using the Expectation Maximization (EM) method. According to the

In this study, 206 women aged between 16 and 67 years participated, with a mean age and standard deviation of 35.13 ± 7.72 . Among the participants, 49 individuals (23.8%) were government employees, 75 (36.4%) were self-employed, and 82 were students. The educational levels of the participants included 49 with a diploma or below, 20 with an associate degree, 78 with a bachelor's degree, and 59 with a master's degree. Table 1 presents the means, standard deviations, and correlation coefficients between the study variables. Additionally, Table 1 provides evidence for the assumptions of normal distribution and collinearity.

results shown in Table 1, skewness and kurtosis values for the study variables were within ± 2 , indicating that the data distribution is within the normal range.

Table 2

Correlation Matrix of Study Variables

| Variables | 1 | 2 | 3 | 4 | 5 |
|---------------------------|----------|----------|---------|---------|---|
| 1. Post-Traumatic Growth | 1 | | | | |
| 2. Emotion-Focused Coping | -0.243** | 1 | | | |
| 3. Problem-Focused Coping | 0.208** | -0.454** | 1 | | |
| 4. Resilience | 0.482** | -0.212* | 0.552** | 1 | |
| 5. Mindfulness | 0.271* | -0.287** | 0.327** | 0.375** | 1 |

*p < .05, **p < .01

The structural model fit was tested using structural equation modeling, assuming relationships among resilience, mindfulness, and post-traumatic growth in cancer-affected individuals considering the mediating role

of coping styles. The fit indices indicated a satisfactory fit of the structural model to the collected data ($\chi^2/df = 1.39$, CFI = .981, GFI = .974, AGFI = .944, RMSEA = .044).

Table 3

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

| Paths | B | S.E | β | t | P |
|--|--------|-------|---------|--------|--------|
| Path Coefficient Resilience → Post-Traumatic Growth | 1.530 | 0.489 | 0.357 | 12.59 | < .001 |
| Path Coefficient Mindfulness → Post-Traumatic Growth | 0.423 | 0.032 | 0.482 | 16.17 | < .001 |
| Direct Path Coefficient Resilience → Problem-Focused Coping | 0.271 | 0.128 | 0.320 | 11.44 | < .001 |
| Direct Path Coefficient Resilience → Emotion-Focused Coping | -0.289 | 0.130 | -0.311 | -10.47 | < .001 |
| Direct Path Coefficient Mindfulness → Problem-Focused Coping | 0.345 | 0.144 | 0.386 | 14.35 | < .001 |
| Direct Path Coefficient Mindfulness → Emotion-Focused Coping | -0.244 | 0.125 | -0.364 | -13.14 | < .001 |

| | | | | | |
|--|--------|-------|--------|--------|--------|
| Indirect Path Coefficient Resilience → Problem-Focused Coping | 0.146 | 0.068 | 0.172 | 8.44 | < .008 |
| Indirect Path Coefficient Resilience → Emotion-Focused Coping | -0.214 | 0.048 | -0.241 | -10.15 | < .001 |
| Indirect Path Coefficient Mindfulness → Problem-Focused Coping | 0.191 | 0.057 | 0.213 | 9.10 | < .001 |
| Indirect Path Coefficient Mindfulness → Emotion-Focused Coping | -0.224 | 0.114 | -0.264 | -12.44 | < .001 |

Table 3 demonstrates that the direct path coefficient between resilience and post-traumatic growth is positive and significant at the .05 level ($p < .05$, $\beta = .35$). Additionally, the direct path coefficient between mindfulness and post-traumatic growth is positive and significant at the .01 level ($p < .01$, $\beta = .48$). The study concluded that post-traumatic growth significantly and positively mediates the relationship between resilience, mindfulness, and problem-focused coping style, and negatively with emotion-focused coping style.

4. Discussion and Conclusion

In discussing and explaining the article that examines the relationship between resilience and mindfulness with post-traumatic growth, particularly focusing on the mediating role of coping styles in individuals with cancer, post-traumatic growth refers to positive experiences that may follow life-changing events, such as a cancer diagnosis. This concept includes positive changes in self-perception, relationships with others, and life philosophy. The findings of this study indicate a positive relationship between resilience and post-traumatic growth, aligning with parts of the findings from prior studies (Amani et al., 2022; Mohlin et al., 2021; Shi et al., 2022). This process, sometimes known as transformation after trauma, can include enhancing social relationships, increasing empathy and understanding, and developing spirituality (Mohlin et al., 2021).

This article explores how resilience can serve as a platform for personal growth and how individuals can use their challenging experiences to build a better future. Mindfulness, defined as attentive and non-judgmental awareness of the present moment, can significantly influence stress management and improve quality of life. In the context of cancer, which is a stressful and life-altering experience, mindfulness can serve as an important tool for post-traumatic growth. Post-traumatic growth refers to positive changes that individuals may experience after enduring highly challenging events such as cancer. These changes can include enhanced social relationships, increased appreciation of life, discovery of new life meanings, and personal development. Studies have shown that mindfulness can help reduce anxiety symptoms and increase tolerance for ambiguity in women with cancer (Aghdam et al., 2022;

Lianchao & Tingting, 2020). Furthermore, mindfulness can contribute to improving post-traumatic growth and reducing anxiety about death in breast cancer patients.

An individual's ability to cope with stress and psychological pressures can significantly impact their ability to grow and develop after difficult experiences. Therefore, understanding how individuals can use their coping styles to enhance resilience and experience post-traumatic growth is crucial for supporting recovery and personal development after crises (Cerezo et al., 2022). In explaining the relationship between resilience and post-traumatic growth mediated by coping styles, resilience is defined as the individual's ability to withstand difficult conditions and return to normal after experiencing harms and psychological pressures. On the other hand, post-traumatic growth refers to the positive and personal development changes that individuals may experience following tough and challenging experiences. Coping styles refer to the methods individuals use to manage stress and psychological pressures. These styles can be divided into two general categories: problem-focused and emotion-focused. Problem-focused coping concentrates on solving problems and directly confronting challenges, while emotion-focused coping focuses more on reducing the stress and tensions from difficult situations. Studies have shown that coping styles can mediate the relationship between resilience and post-traumatic growth. In other words, individuals who use effective coping styles may have a greater ability to experience post-traumatic growth (Cho et al., 2020). Additionally, enhancing social support and teaching problem-focused coping strategies can help individuals experience more growth after trauma (Hsu et al., 2021). Individuals with higher resilience tend to use problem-focused strategies and are more likely to adopt a positive coping attitude and create a detailed plan to eliminate stress (Tuncay & Musabak, 2015). As a result, these individuals feel more in control over the situation and report more post-traumatic growth (Kiani et al., 2020).

The results of the present study indicate a positive and significant relationship with post-traumatic growth. The findings align with parts of the prior research (Aghdam et al., 2022; Burgess et al., 2021; Lianchao & Tingting, 2020; Segal et al., 2018). The relationship between mindfulness and post-traumatic growth in women with cancer, considering the mediating role of coping styles, is a topic

that can contribute to a better understanding of the psychological processes that assist these patients on their path to recovery and personal development. Mindfulness refers to a state of present awareness without judgment, where the individual pays attention to their momentary experiences. This state can help reduce stress and increase resilience, both important factors in post-traumatic growth; mindfulness allows individuals to confront ineffective emotions and attitudes and positively assess events. When individuals become aware of the present, they do not focus on issues related to the past and future, resulting in a more flexible mindset. This allows cancer patients to step out of their automatic emotional and cognitive harmful systems and move forward on their paths of growth (Aghdam et al., 2022; Lianchao & Tingting, 2020). For women with cancer, using mindfulness can help them cope more constructively with the stresses of diagnosis and treatment. This, in turn, can lead to strengthening problem-focused coping styles and consequently, aiding in post-traumatic growth. Post-traumatic growth in this context can include positive changes in attitudes, increased inner strength, and spiritual development. Studies have shown that mindfulness can act as an effective tool to assist women with cancer on their paths to recovery and personal development (Lianchao & Tingting, 2020). This approach can help them deal more positively with challenges associated with the disease and use their difficult experiences for personal growth and development.

5. Limitations and Suggestions

The limitations of the present research include the use of non-random samples that may not reflect the full diversity of patient experiences. Factors such as age, gender, culture, and socio-economic status can affect resilience and post-traumatic growth and should be considered in future research. Beyond coping styles, other variables such as social support and spirituality may also play a role in post-traumatic growth. Conducting longitudinal studies can help better understand changes in resilience, mindfulness, and post-traumatic growth over time. To increase the validity and generalizability of the results, the use of larger and more

diverse samples is necessary. The study of the role of other intervening factors such as social support and spirituality in the relationship between resilience, mindfulness, and post-traumatic growth is recommended. Comparative cultural studies to understand the impact of culture on resilience and post-traumatic growth are also suggested. These recommendations can help researchers gain a deeper understanding of the complexities in the relationship between resilience, mindfulness, and post-traumatic growth and achieve results with more practical applicability for individuals with cancer.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

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

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