Modeling the Structural Relationships of Post-Traumatic Growth Based on Perceived Social Support and Emotion Regulation with the Mediating Role of Self-Care Behaviors in Women with Breast Cancer

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Objective: This study aimed to model the structural relationships between perceived social support and emotion regulation with post-traumatic growth (PTG), emphasizing the mediating role of self-care behaviors in women diagnosed with breast cancer.

Methods and Materials: The research employed a descriptive–correlational design using structural equation modeling (SEM). The statistical population comprised all women with breast cancer in Tehran, Iran. A total of 310 participants were selected through convenience sampling. Data collection tools included the Post-Traumatic Growth Inventory (Tedeschi & Calhoun, 1996), the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), the Affect Control Questionnaire (Williams & Chambless, 1997), and the Self-Efficacy for Self-Care Scale (Lorig, 1996). Data were analyzed using SPSS version 26 and AMOS software. Descriptive and inferential statistics, including direct and indirect effect testing and fit indices, were applied to evaluate the proposed model.

Findings: The results indicated that perceived social support ($\beta = 0.20$, $t = 3.35$, $p < 0.001$) and emotion regulation ($\beta = 0.26$, $t = 3.78$, $p < 0.001$) had significant direct effects on PTG. Additionally, both variables significantly predicted self-care behaviors ($\beta = 0.36$, $t = 4.20$, and $\beta = 0.39$, $t = 4.55$, respectively). Self-care behaviors also had a strong direct effect on PTG ($\beta = 0.47$, $t = 5.35$, $p < 0.001$) and mediated the indirect relationships between social support, emotion regulation, and PTG ($\beta = 0.17–0.18$, $p < 0.001$). The overall model demonstrated an excellent fit ($\chi^2/df = 2.10$; RMSEA $= 0.05$; CFI $= 0.94$; GFI $= 0.96$).

Conclusion: The findings suggest that fostering social support, improving emotion regulation, and enhancing self-care behaviors can collectively promote post-traumatic growth among women with breast cancer.

Keywords: *post-traumatic growth, perceived social support, emotion regulation, self-care behaviors.*

1. Introduction

Post-traumatic growth (PTG) is conceptualized as a positive psychological transformation that occurs following the struggle with highly challenging life circumstances, including life-threatening diseases such as cancer. It refers to the experience of individuals who, after facing trauma, report a greater appreciation of life, more meaningful interpersonal relationships, spiritual development, and enhanced personal strength (Zhang et al., 2025). In the context of breast cancer, women often endure multiple physical, psychological, and social stressors that can simultaneously challenge and foster personal growth (Aflakseir et al., 2018). Although cancer is generally perceived as a distressing and debilitating experience, the possibility of PTG among survivors has received increasing empirical attention, emphasizing the role of coping, emotional regulation, and social support mechanisms (Kim et al., 2023).

Cancer patients, particularly women with breast cancer, experience a wide spectrum of emotional challenges including fear of recurrence, changes in body image, anxiety, and depression. However, these adversities can also serve as catalysts for psychological growth and resilience development (Gu et al., 2023). PTG in this population is shaped by multiple factors such as perceived social support, coping strategies, emotion regulation, and individual differences in meaning-making processes (Babazadeh Nemini et al., 2021). Perceived social support, as a multidimensional construct encompassing emotional, instrumental, and informational components, plays a central role in moderating stress and promoting adaptive adjustment (Wu et al., 2024).

Empirical studies have demonstrated that social support from family, friends, and significant others enhances one's capacity to cope with trauma and promotes well-being among cancer survivors (Savenysheva & Razygraeva, 2024). For instance, supportive relationships provide emotional reassurance, facilitate open communication about illness-related stress, and strengthen coping mechanisms, which collectively foster a sense of security and hope (Yao et al., 2024). Similarly, social networks serve as vital resources for reframing traumatic experiences and instilling meaning in adversity, which are key antecedents of PTG (K. Zahra et al., 2024). In this regard, perceived social support has consistently been identified as a significant predictor of PTG among patients dealing with chronic diseases and life-threatening illnesses (Mousavi et al., 2020).

Emotion regulation, defined as the ability to monitor, evaluate, and modify emotional reactions to achieve one's goals, is another crucial factor influencing the psychological adjustment of breast cancer patients (Zeinali Siavoshani & Dehghan, 2021). Effective emotion regulation allows individuals to process distressing information related to diagnosis and treatment in adaptive ways, facilitating cognitive restructuring and psychological resilience (Mohammad & Borjali, 2021). On the contrary, maladaptive regulation strategies such as suppression or avoidance may exacerbate distress and impede growth (Zeinali Siyavashani & dehghan, 2021). Research indicates that higher emotional regulation capacities are associated with reduced negative affect, improved coping, and greater PTG (Kim et al., 2023).

The relationship between social support and PTG is not merely direct; it is often mediated through other psychological processes such as resilience, self-efficacy, and self-care behaviors (Nemini et al., 2021). In this regard, self-care behaviors — encompassing emotional, physical, and psychological self-management practices — are considered vital in promoting recovery and enhancing mental health outcomes in women with breast cancer (Chin et al., 2021). Self-care practices such as regular health monitoring, emotional expression, stress management, and maintaining healthy routines contribute to a sense of control, which in turn enhances PTG (Gu et al., 2023). In addition, self-efficacy in managing self-care tasks mediates the relationship between perceived support and quality of life, suggesting that women who feel competent in caring for themselves tend to experience higher PTG levels (Chin et al., 2021).

In the broader psychological context, resilience functions as a mediating construct that connects supportive social interactions and positive post-traumatic transformations (R. Zahra et al., 2024). Resilient individuals tend to reinterpret adversity as a challenge rather than a threat, which facilitates cognitive reappraisal and goal reorientation — both core mechanisms in PTG (Yao et al., 2024). The literature also highlights that interventions aimed at enhancing meaning in life, emotional awareness, and social connectedness can significantly improve resilience and, consequently, PTG (Karimi Dastaki & Mahmudi, 2024). Meaning-centered therapy, in particular, has been effective in helping individuals redefine their existential perspectives after cancer diagnosis, reinforcing the view that growth can coexist with suffering (Karimi Dastaki & Mahmudi, 2024).

Cultural and contextual factors also shape the manifestation of PTG. For instance, religious or spiritual

frameworks can influence coping styles and social support structures that underlie growth trajectories (R. Zahra et al., 2024). In societies with strong collectivist orientations, such as Iran, the perceived presence of family and community support plays a particularly crucial role in fostering PTG among breast cancer patients (Aflakseir et al., 2018). The interaction of spirituality, religiosity, and social relationships provides an existential foundation that strengthens hope and gratitude, two emotions closely linked with positive adaptation after trauma (K. Zahra et al., 2024).

Recent international research corroborates that PTG emerges not only as a psychological adaptation but also as a form of identity transformation following traumatic stress (Zhao, 2025). This transformation often involves deliberate rumination — a process of purposeful reflection on traumatic events — which facilitates meaning-making and fosters adaptive emotional outcomes (Zhang et al., 2025). Purposeful rumination acts as a cognitive bridge between negative experiences and positive change, allowing individuals to derive new insights and life priorities (Zhao, 2025). Similarly, PTG has been identified among adolescents and young adults who have faced adverse experiences, further confirming its universal potential across age groups and types of trauma (Zhang et al., 2025).

From a psychosocial perspective, self-care behaviors can be viewed as both outcomes and facilitators of PTG. As individuals begin to integrate their traumatic experience, they often adopt proactive coping and health management behaviors that reinforce their sense of empowerment (Chin et al., 2021). Such adaptive engagement not only improves physical health outcomes but also fosters emotional stability and interpersonal functioning (Gu et al., 2023). Studies on women with chronic illnesses demonstrate that self-care mediates the association between self-efficacy and overall quality of life, underscoring the dynamic interplay between psychological resources and behavioral responses (Chin et al., 2021).

Moreover, findings from studies on various populations, including mothers of children with disabilities (Savenysheva & Razygraeva, 2024), nursing students exposed to traumatic situations (Kim et al., 2023), and parents of premature infants (Wu et al., 2024), have revealed consistent patterns: individuals who perceive higher levels of social support and employ adaptive emotion regulation strategies tend to experience more significant growth. These results reinforce the argument that social and emotional factors collectively shape post-trauma adaptation processes, rather than acting independently.

Despite the well-documented relationships between perceived social support, emotion regulation, and PTG, the role of self-care behaviors as a mediating mechanism remains underexplored in women with breast cancer. Given that self-care not only reflects active coping and health maintenance but also facilitates the reestablishment of autonomy and self-worth, its potential as a psychological bridge warrants closer examination (Babazadeh Nemini et al., 2021). Integrating these variables within a structural model can provide deeper insight into the pathways through which psychosocial resources contribute to post-traumatic growth among cancer patients.

Taken together, the existing literature emphasizes the significance of perceived social support and emotion regulation in fostering PTG, yet highlights the necessity of identifying behavioral mediators that translate these psychological resources into measurable growth outcomes (Gu et al., 2023; Kim et al., 2023). Understanding these mediational processes can inform therapeutic interventions that enhance adaptive coping and recovery in breast cancer survivors (Karimi Dastaki & Mahmudi, 2024). Therefore, the present study aims to model the structural relationships between perceived social support, emotion regulation, and post-traumatic growth with the mediating role of self-care behaviors in women with breast cancer.

2. Methods and Materials

2.1. Study design and Participant

The present study employed a descriptive–correlational design using structural equation modeling (SEM). The statistical population included all women diagnosed with breast cancer in Tehran, for whom no precise statistics were available. The sample size was determined using Morgan's table and consisted of 310 participants. Sampling was conducted using a convenience method. The researcher visited medical centers to identify individuals diagnosed with breast cancer, and after obtaining informed consent, they voluntarily participated in the study.

Inclusion criteria included: confirmed diagnosis of breast cancer for at least one year; completion of chemotherapy sessions; a minimum education level of a high school diploma; age range between 45 and 55 years; no use of psychiatric medication; no reported psychiatric disorders (self-reported); and being in stages 1 or 2 of breast cancer. Exclusion criteria included incomplete questionnaire responses and unwillingness to continue participation.

2.2. Measures

Post-Traumatic Growth Inventory (PTGI): This inventory, developed by Tedeschi and Calhoun (1996), consists of 21 items rated on a 6-point Likert scale ranging from 0 (never) to 5 (very often). Tedeschi and Calhoun (1996) reported satisfactory validity and reliability, with a total Cronbach's alpha of .90 and subscale alphas ranging from .67 to .85. Positive correlations were found between the PTGI and measures of optimism, religiosity, and the NEO personality factors (except neuroticism). The original inventory comprises five subscales: appreciation of life, new possibilities, personal strength, relating to others, and spiritual change. In Iran, Seyed Mahmoudi et al. (2013) reported test–retest reliability and overall Cronbach's alpha coefficients of .94 and .92, respectively, and subscale alphas of .90, .75, .74, .66, and .86. They also found significant positive correlations between the four PTGI factors and positive affect (Jaber Ansari, 2020). In the present study, the Cronbach's alpha coefficient was .91.

Multidimensional Scale of Perceived Social Support (MSPSS): The MSPSS was developed by Zimet et al. (1988) to measure perceived social support from three sources: family, friends, and significant others. The 12-item scale is rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The total score ranges from 12 to 84, with subscale scores between 4 and 28; higher scores indicate greater perceived social support. Reported Cronbach's alpha coefficients ranged from .81 to .90 for family support, .90 to .94 for friend support, .83 to .98 for significant others, and .84 to .92 for the total scale (Zimet et al., 1988, 1990). Test–retest correlations conducted with 74 women and 63 men over a 2–4 week interval were .78 for total support, .75 for friend support, and .69 for significant others, confirming stability at p < .001. In Iran, Besharat (2007) confirmed the three-factor structure (family, friends, community) through exploratory and confirmatory factor analysis, which supported the structural validity of the MSPSS. The Cronbach's alpha coefficient obtained in the present study was .88.

Affect Control Questionnaire (ACQ): The ACQ, developed by Williams and Chambless (1997), assesses individuals' ability to regulate their emotions. It includes four subscales: anger, depressed mood, anxiety, and positive affect. It is a self-report measure with responses rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Items 38 and 31, 30, 27, 22, 21, 18, 17, 16, 12, 9, and 4 are reverse scored. Four-week test–retest reliability coefficients were reported as .73 and .72 for anger, .76 and .91 for depressed mood, .77 and .89 for anxiety, and .66 and .84 for positive affect. Convergent validity with the Positive Affect subscale of the Positive and Negative Affect Schedule (Watson et al., 1988) was .36, and divergent validity with the Negative Affect subscale was .58 (Williams et al., 1997; Mills et al., 2018). In Iran, Dehesh (2009) reported Cronbach's alpha values of .53 for anger, .84 for depressed mood, .64 for anxiety, and .60 for positive affect, confirming acceptable reliability (Houshmand, 2019). Tahmasbian et al. (2014) reported strong correlations between affect control and its dimensions: anger (.765), depressed mood (.751), anxiety (.871), and positive affect (.844), confirming its validity. The Cronbach's alpha obtained in the present study was .78.

Self-Efficacy for Self-Care Questionnaire (SUPPH): The Self-Care Self-Efficacy Scale, originally developed by Lorig (1996) for patients with chronic illnesses, was translated into Persian by Azizi Fini. The scale consists of 29 items rated on a 5-point Likert scale from 1 (not at all confident) to 5 (completely confident), covering four dimensions: coping, stress reduction, decision-making, and enjoyment of life. Total scores range from 29 to 145, with higher scores indicating greater self-efficacy in self-care. Internal consistency reliability was reported at .94, and its correlation with the Health Behavior Scale was .61. Content and face validity were verified by a panel of 10 faculty members from Hamadan University of Medical Sciences. Test–retest reliability with a two-week interval in 10 patients yielded a Pearson correlation of .75, and Cronbach's alpha was .94. In the present study, the Cronbach's alpha coefficient was .81.

2.3. Data Analysis

After determining the sample size, data were collected using online questionnaires distributed as a survey link among participants. Once completed, the questionnaires were gathered and scored. Data were analyzed using SPSS version 26 in two sections: descriptive and inferential statistics. The descriptive analysis addressed participants' demographic characteristics as well as mean and standard deviation scores. The inferential analysis examined direct and indirect relationships and effects among variables. Assumptions such as normality were tested using the Kolmogorov–Smirnov test, and multicollinearity was assessed via the Durbin–Watson statistic, Variance Inflation Factor (VIF), and tolerance indices. Data analyses were performed using AMOS and SPSS version 26.

3. Findings and Results

The mean age of participants in this study was 50.1 years with a standard deviation of 3.10. The minimum age was 45 years and the maximum was 55 years. Regarding educational level, 153 participants (49.4%) held a high school diploma, 94 (30.3%) had an associate degree, 49 (15.8%) held a bachelor's degree, and 14 (4.5%) had a master's degree. The duration since breast cancer diagnosis was at least one year for 180 participants (58.1%), between two to four years for 104 participants (33.5%), and more than four years for 26 participants (8.4%).

Table 1

Descriptive Findings of Research Variables and Their Subscales

Variable	Subscale	Mean	SD	Skewness	Kurtosis
Post-Traumatic Growth	Appreciation of Life	14.8	4.49	-0.208	-0.805
	New Possibilities	11.1	4.41	-0.041	-1.10
	Personal Strength	12.3	3.31	0.209	-0.341
	Relating to Others	11.6	3.92	-0.099	0.983
	Spiritual Change	8.64	1.65	0.245	-0.374
Perceived Social Support	Family Support	11.8	4.02	0.056	-0.765
	Friend Support	16.8	2.80	0.089	-0.114
	Significant Others	16.5	2.71	-0.123	0.111
Emotion Regulation	Anger	27.2	3.64	-0.136	0.240
	Depressed Mood	15.9	3.16	0.824	1.07
	Anxiety	21.9	3.06	0.205	0.004
	Positive Affect	22.07	3.41	-0.213	-0.403
Self-Care Behaviors	Coping	23.5	3.22	0.649	0.867
	Stress Reduction	11.3	2.27	-0.535	-0.065
	Decision-Making	8.09	1.84	-0.896	0.272
	Enjoyment of Life	21.9	3.28	-0.341	-0.445

Table 1 shows the descriptive statistics of the variables and their subscales. The reported skewness and kurtosis values fall within the ±2 range, indicating that the data are normally distributed. One of the key assumptions in structural equation modeling (SEM) is multivariate normality. In AMOS software, Mardia's multivariate kurtosis coefficient is used for this purpose. Bentler (2005) suggested that Mardia's coefficient values greater than 5 indicate non-normal data distribution (Byrne, 2010). The Mardia coefficient for the current study data was 2.80, confirming the assumption of multivariate normality. When continuous data do not significantly deviate from normality, the Maximum Likelihood (ML) estimation method can be appropriately used.

Table 2

Tolerance and Variance Inflation Factor (VIF) Indices

Predictor Variables	Tolerance	VIF
Family Support	0.622	1.60
Friend Support	0.667	1.49
Significant Others	0.753	1.32
Anger	0.669	1.49
Depressed Mood	0.686	1.45
Anxiety	0.704	1.42
Positive Affect	0.967	1.09
Coping	0.734	1.36
Stress Reduction	0.787	1.27
Decision-Making	0.597	1.67
Enjoyment of Life	0.946	1.97

As shown, all the obtained values indicate the absence of multicollinearity among the predictor variables. The initial model of the study (testing the main hypothesis that the structural relationship model of post-traumatic growth based on perceived social support and emotion regulation with the mediating role of self-care behaviors in women with breast cancer has a good fit) was then evaluated. The results of the

standardized model estimation, along with key model fit indices, are presented below.

Table 3

Model Fit Indices

Index	Fit Statistic	Obtained Value	Acceptable Range
χ^2/df	2.10	< 3	
RMSEA (Root Mean Square Error of Approximation)	0.05	< 0.10	
CFI (Comparative Fit Index)	0.94	> 0.90	
NFI (Normed Fit Index)	0.91	> 0.90	
GFI (Goodness of Fit Index)	0.96	> 0.90	
AGFI (Adjusted Goodness of Fit Index)	0.94	> 0.90	

In general, when working with AMOS, each index alone is not sufficient to confirm or reject model fit; rather, these indices must be interpreted collectively. The obtained values demonstrate that the overall model has an acceptable level of explanatory and fit quality. The measurement model indices are reported in the following section.

Table 4

Standardized Factor Loadings and Significance Levels of Measurement Models

Scale	Component	Standardized Weight	Significance Level (p)
Post-Traumatic Growth	Appreciation of Life	0.52	0.001
	New Possibilities	0.28	0.001
	Personal Strength	0.46	0.001
	Relating to Others	0.67	0.001
	Spiritual Change	0.52	0.001
Perceived Self-Efficacy	Family Support	0.70	0.001
	Friend Support	0.65	0.001
	Significant Others	0.55	0.001
Emotion Regulation	Anger	0.63	0.001
	Depressed Mood	0.52	0.001
	Anxiety	0.48	0.001
	Positive Affect	0.44	0.001
Self-Care Behaviors	Coping	0.69	0.001
	Stress Reduction	0.70	0.001
	Decision-Making	0.65	0.001
	Enjoyment of Life	0.53	0.001

As shown in Table 4, all factors across the five scales demonstrated significant factor loadings at the 99% confidence level (p < .01). Since the paths among variables in the tested model correspond to the study hypotheses, the next section presents the results for direct and indirect effects, including statistical coefficients and significance values.

Table 5

Standardized Coefficients and Significance Levels of Direct Effects of Perceived Social Support on Post-Traumatic Growth

Dependent Variable	Predictor Variable	Type of Effect	Standardized β	t-value	p-value
Post-Traumatic Growth	Perceived Social Support	Direct	0.20	3.35	0.001
Post-Traumatic Growth	Emotion Regulation	Direct	0.26	3.78	0.001
Self-Care Behaviors	Perceived Social Support	Direct	0.36	4.20	0.001
Self-Care Behaviors	Emotion Regulation	Direct	0.39	4.55	0.001
Post-Traumatic Growth	Self-Care Behaviors	Direct	0.47	5.35	0.001

The results in Table 5 show that perceived social support had a significant direct effect on post-traumatic growth (t = 3.35, β = 0.20). Emotion regulation also had a significant direct effect on post-traumatic growth (t = 3.78, β = 0.26).

Moreover, perceived social support had a significant direct effect on self-care behaviors (t = 4.20, β = 0.36), and emotion regulation demonstrated a significant direct effect on self-care behaviors (t = 4.55, β = 0.39). In addition, self-care behaviors had a significant direct effect on post-traumatic growth (t = 5.35, β = 0.47).

Table 6

Standardized Coefficients and Significance Levels of Indirect Effects of Perceived Social Support on Post-Traumatic Growth through Self-Care Behaviors

Dependent Variable	Predictor Variable	Type of Effect	Standardized β	t-value	p-value
Post-Traumatic Growth	Perceived Social Support	Indirect (via Self-Care)	0.17	3.35	0.001
Post-Traumatic Growth	Emotion Regulation	Indirect (via Self-Care)	0.18	3.40	0.001

Figure 1

Final Model of the Study
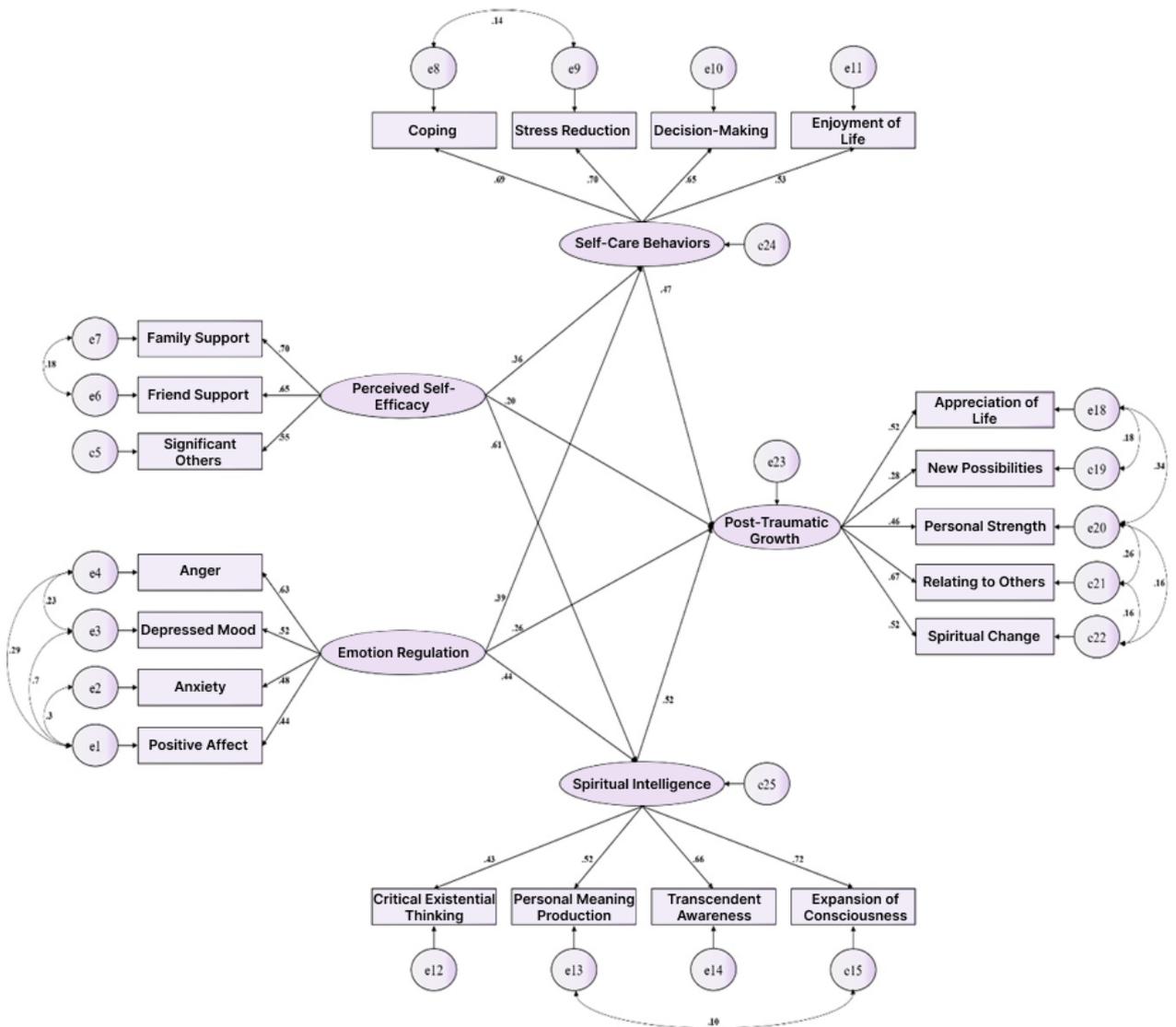
To examine the mediating effect of self-care behaviors on the relationship between perceived social support and post-traumatic growth, the Sobel test was used. This test directly evaluates the significance of the indirect effect (*ab*) against the standard normal distribution (*Z*) using the standard error of the mediator. Specifically, the product of the two unstandardized coefficients representing the mediator paths is divided by its standard error, and the resulting ratio is compared to the standard normal distribution. If the obtained *Z* value exceeds 1.96, the mediating effect is considered statistically significant.

The results presented above indicate that the proposed hypothesis was confirmed at the 99% confidence level (p < .01). Additionally, the mediating effect of self-care behaviors on the relationship between emotion regulation and post-traumatic growth was also tested using the Sobel test, and this hypothesis was supported at the 95% confidence level (p < .01).

4. Discussion and Conclusion

The present study aimed to model the structural relationships among perceived social support, emotion regulation, and post-traumatic growth (PTG) with the mediating role of self-care behaviors in women with breast cancer. The results demonstrated that perceived social support and emotion regulation exerted significant direct effects on PTG, while self-care behaviors played an important mediating role in this association. These findings align with the broader literature emphasizing the interplay between cognitive–emotional processes, supportive social environments, and self-regulatory behaviors in promoting growth following trauma (Gu et al., 2023; Kim et al., 2023; Zhang et al., 2025).

The finding that perceived social support has a significant positive effect on PTG is consistent with previous studies that have highlighted the pivotal role of social relationships in facilitating psychological recovery and meaning-making after trauma (Aflakseir et al., 2018; Mousavi et al., 2020; K. Zahra et al., 2024). Supportive social networks provide a sense of belonging and security, enabling individuals to reappraise their experiences more adaptively and to cultivate positive emotional states that foster growth. Women with breast cancer, in particular, often rely on family members, close friends, and health professionals as vital sources of emotional and instrumental support throughout their treatment journey (Gu et al., 2023). These interactions not only reduce perceived isolation but also validate their

experiences, creating an atmosphere of empathy and understanding that promotes resilience and self-efficacy (Yao et al., 2024). The mediating role of self-care in the present model suggests that individuals who perceive high social support are more likely to engage in active coping behaviors such as maintaining physical health routines, adhering to medical regimens, and seeking psychological support, which in turn enhance PTG outcomes (Chin et al., 2021).

Furthermore, the significant influence of emotion regulation on PTG supports earlier research that identifies emotional management as a cornerstone of adaptive post-traumatic adjustment (Kim et al., 2023; Zeinali Siavoshani & Dehghan, 2021; Zeinali Siyavashani & dehghan, 2021). Emotion regulation allows individuals to process distressing experiences constructively rather than avoidantly, transforming emotional pain into self-reflective growth. For women facing the uncertainties of cancer, adaptive regulation strategies such as cognitive reappraisal, acceptance, and emotional expression can alleviate distress and foster optimism (Mohammad & Borjali, 2021). Conversely, suppression or avoidance may intensify negative affect and hinder meaning reconstruction. The current findings underscore that enhancing patients' ability to regulate emotions effectively can serve as a therapeutic pathway toward increased PTG, supporting the notion that emotional intelligence and self-regulation are essential mechanisms for psychological adaptation to cancer-related trauma (Karimi Dastaki & Mahmudi, 2024).

The mediating role of self-care behaviors found in this study highlights an important behavioral component that connects social and emotional resources to positive psychological outcomes. This is in line with findings from Chin et al. (2021), who reported that self-care mediates the relationship between self-efficacy and quality of life among breast cancer patients (Chin et al., 2021). Engaging in proactive self-care—such as managing symptoms, reducing stress, and maintaining healthful behaviors—empowers individuals to regain control over their bodies and emotions, thereby facilitating PTG. Similarly, research on chronic illness populations has shown that self-care not only mitigates distress but also enhances self-esteem and personal agency (Gu et al., 2023). From a theoretical standpoint, self-care may represent an applied form of resilience—a behavioral manifestation of one's internal coping capacity. Individuals who receive consistent emotional support and can regulate emotions effectively are more inclined to practice self-care behaviors, which in turn help them

integrate their traumatic experience into a new sense of identity and purpose (R. Zahra et al., 2024).

In addition, the results indicate that self-care behaviors fully or partially mediate the effect of social support and emotion regulation on PTG. This finding reinforces prior evidence that mediating mechanisms bridge cognitive–emotional processes and psychosocial outcomes in trauma recovery (Babazadeh Nemini et al., 2021; Nemini et al., 2021). For example, social support enhances motivation for self-management, while emotion regulation skills enable patients to sustain these behaviors even during periods of physical and psychological fatigue. The current model thus provides empirical validation for an integrative framework where psychosocial resources and self-regulatory practices jointly shape growth trajectories. This integration is supported by the resilience model of post-traumatic adjustment, which posits that positive changes following trauma arise from a dynamic interaction between social connection, emotional stability, and goal-oriented behavior (Yao et al., 2024; K. Zahra et al., 2024).

The positive effect of social support on self-care behaviors found in this study also aligns with evidence that perceived emotional and practical assistance encourages patients to adopt healthier lifestyles and adhere to treatment recommendations (Aflakseir et al., 2018). When patients feel supported by family, friends, or peers, they tend to exhibit higher motivation to follow medical guidance, engage in rehabilitation activities, and maintain psychological well-being (Gu et al., 2023). These behavioral adaptations are essential not only for physical recovery but also for fostering autonomy and internal strength, both of which contribute to PTG. Moreover, patients who experience consistent social reinforcement are more likely to interpret their illness as a shared challenge rather than a solitary struggle, reinforcing collective resilience and hope (Savenysheva & Razygraeva, 2024).

The significant association between emotion regulation and self-care behaviors is another noteworthy outcome of this study. Emotionally competent individuals are better able to recognize their needs, tolerate distress, and engage in behaviors that restore balance (Kim et al., 2023). In cancer contexts, where uncertainty and fear are prevalent, emotion regulation serves as a psychological anchor that sustains adherence to self-care regimens. As prior research suggests, emotional awareness and regulation strengthen patients' self-management capacity, reduce avoidance tendencies, and promote problem-focused coping (Zeinali Siyavashani & dehghan, 2021). Therefore, interventions that target emotion regulation skills can indirectly enhance self-care engagement and subsequent PTG.

The direct relationship observed between self-care behaviors and PTG supports the notion that self-directed health management can foster psychological growth after trauma (Chin et al., 2021). Through self-care, individuals enact agency in the recovery process, cultivating a renewed sense of competence and control. Engaging in healthy routines, stress reduction practices, and meaningful activities not only enhances physical outcomes but also contributes to emotional resilience. This aligns with findings from Yao et al. (2024), who demonstrated that individuals with a proactive personality and a strong sense of meaning in life experienced greater PTG following adversity (Yao et al., 2024). Self-care may thus serve as both a behavioral indicator and facilitator of growth, bridging the gap between internal psychological processes and observable well-being outcomes.

Moreover, the strong fit indices obtained for the structural model (χ^2/df = 2.10; RMSEA = 0.05; CFI = 0.94; GFI = 0.96) confirm the adequacy of the hypothesized pathways, supporting the theoretical coherence of the proposed model. This suggests that PTG among breast cancer patients can be effectively explained through a network of social, emotional, and behavioral factors. Such findings are consistent with cross-cultural research demonstrating the universal role of social support and emotion regulation in fostering growth across diverse populations, including nursing students (Kim et al., 2023), parents of premature infants (Wu et al., 2024), and individuals coping with chronic illnesses (Mousavi et al., 2020).

The current results also align with studies emphasizing resilience as a mediating construct that links psychosocial resources and positive adjustment (Babazadeh Nemini et al., 2021; K. Zahra et al., 2024). Similar to resilience, self-care behaviors can be conceptualized as the behavioral expression of adaptive capacity—the means through which internal strength is translated into tangible recovery efforts. Women who actively participate in their treatment, regulate their emotions, and draw upon social support networks are more likely to experience self-transcendence, optimism, and a renewed life perspective (Karimi Dastaki & Mahmudi, 2024). This interpretation resonates with meaning-centered and existential approaches that describe PTG as an outcome of self-reflection, emotional regulation, and interpersonal connectedness (Zhang et al., 2025).

Interestingly, the results corroborate the idea that PTG is not merely a spontaneous byproduct of trauma but rather the

outcome of active engagement in coping, emotional processing, and behavioral adaptation (Zhao, 2025). Purposeful rumination—a form of reflective thinking identified in trauma survivors—facilitates meaning reconstruction and goal redefinition, ultimately contributing to growth (Zhao, 2025). In the context of breast cancer, this process may be supported by social encouragement and emotional regulation, which together enable patients to transform suffering into a sense of purpose and empowerment (Gu et al., 2023).

Furthermore, cultural factors play a pivotal role in shaping the pathways to PTG. In Iranian society, for example, collectivist values and strong familial bonds often enhance the perceived availability of social support, which may explain the strength of its association with PTG in this study (Aflakseir et al., 2018). At the same time, the integration of spirituality and meaning-making, frequently observed in Eastern cultures, further reinforces resilience and optimism during illness (R. Zahra et al., 2024). Therefore, the interaction between cultural context, social structure, and individual coping mechanisms offers a multidimensional perspective on how PTG manifests among women with breast cancer.

In summary, the findings of this study demonstrate that perceived social support and emotion regulation are critical predictors of PTG, both directly and indirectly through self-care behaviors. These results reinforce the view that PTG is a multifactorial construct shaped by emotional, social, and behavioral processes. By integrating these dimensions into a structural model, this study contributes to the growing body of research that seeks to understand the mechanisms underlying psychological growth in cancer survivors (Babazadeh Nemini et al., 2021; Gu et al., 2023; Kim et al., 2023).

5. Limitations and Suggestions

Despite the valuable contributions of this study, several limitations should be acknowledged. First, the use of a cross-sectional design limits causal inferences regarding the directionality of the relationships among variables. Longitudinal research would allow for better understanding of the temporal dynamics between social support, emotion regulation, self-care, and PTG. Second, the study relied on self-report questionnaires, which are subject to potential biases such as social desirability and inaccurate recall. Third, the sample was limited to women with breast cancer in Tehran, which restricts the generalizability of findings to other cultural or clinical populations. Moreover, unmeasured factors such as personality traits, disease stage, and socioeconomic conditions could have influenced the observed relationships.

Future studies should adopt longitudinal and mixed-method designs to capture the dynamic and multidimensional nature of PTG. Examining the temporal sequence of emotional regulation, self-care, and growth processes would deepen the theoretical understanding of causal mechanisms. Additionally, exploring moderating variables such as age, spirituality, coping styles, and cultural context could enhance the explanatory power of future models. Incorporating qualitative approaches could also yield rich insights into the lived experiences of cancer survivors and the subjective meanings they attribute to growth. Finally, comparative studies across different cancer types, genders, and societies are recommended to test the universality of the proposed model.

From a clinical perspective, the findings underscore the importance of integrating psychosocial and behavioral components into cancer care programs. Healthcare professionals should implement interventions that simultaneously strengthen perceived social support, teach adaptive emotion regulation strategies, and encourage consistent self-care behaviors. Psychoeducational workshops, mindfulness-based stress reduction programs, and meaning-centered therapies can be particularly effective in fostering PTG. Family-centered interventions that promote supportive communication and collective coping may further enhance recovery outcomes. Ultimately, empowering women to actively engage in their emotional and physical self-management can transform the cancer experience into a process of psychological growth and renewed life meaning.

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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