Self-compassion moderates the perceived stress and self-care behaviors link in women with breast cancer.

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Abstract

Purpose: Women with breast cancer are exposed to various stressors, and self-care behaviors play an important role in their recovery. However, very few studies have investigated self-care behaviors specifically for women with breast cancer. The current study examined the relationship between perceived stress and self-care behaviors, and explored whether self-compassion moderated this relationship.

Methods: A sample of 210 women with breast cancer aged 27-60 years old from three hospitals in Tehran, Iran completed online self-report questionnaires of self-care behaviors, self-compassion, and perceived stress.

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Results: Data analyses with Structural Equation Modeling showed that perceived stress ($\beta=-.37$, $p<.01$) and self-compassion ($\beta=.38$, $p<.01$) were significant predictors of self-care behaviors. The interaction-moderation analysis showed that self-compassion acted as a moderator between perceived stress and self-care behaviors.

Conclusions: The findings enhance our understanding about the protective role of self-compassion in the relationship between perceived stress and self-care behaviors in women with breast cancer.

Key words: perceived stress, self-care behaviors, self-compassion, women, breast cancer, oncology, cancer, distress, women with breast cancer, moderator

1 INTRODUCTION

Breast cancer is the most common cancer among females worldwide, with a mortality rate of 16%¹. More than 6,000 people in Iran are diagnosed with breast cancer each year². Breast cancer, as well as the side effects of its treatment, may exacerbate stress and have a significant impact on the quality of life of patients³. Studies have shown that self-care behaviors play an important role in successful treatment outcomes^{4,5}. Self-care relates to the proactive behaviors and attitudes that contribute to the ability to manage and maintain psychological, social, spiritual, and physical needs. The practice of self-care in patients with cancer has been found to be an effective strategy with implications related to improved health and well-being^{4,5}; however, very few studies have investigated women with breast cancer specifically.

Women with breast cancer experience higher levels of stress compared to women without breast cancer due to additional concerns related to their illness². For example, women with breast cancer may report feeling worried about changes in their appearance, the impact of their disease on family, especially children, and the recurrence of cancer in the future⁹. Therefore, the experience of stress can be further influenced by the personal evaluations and perceptions related

to breast cancer and its many areas of possible impact. Perceived stress is a deeply subjective experience some individuals may perceive a situation manageable; however, others may perceive the same situation unmanageable and uncontrollable. The level of stress someone experiences is therefore determined by the difference between a person's perceived stress and their perceived ability to cope with the stress⁸. Studies have shown that perceived stress has a negative influence on physical and psychological health of breast cancer patients⁹. Previous studies also have shown an inverse relationship between stress and self-care behaviors in university students⁹ and nurses¹⁰.

Self-compassion has received little attention in self-care literature among women with breast cancer. Self-compassion is the ability to be kind towards oneself when facing difficulties and challenges in life¹¹. Self-compassion comprises three components: self-kindness (being kind and supporting oneself during times of difficulty instead of judging, punishing, and criticizing), common humanity (perceiving difficulties as part of human experiences in life rather than feeling ashamed), and mindful acceptance (being aware of, and accepting painful thoughts and feelings rather than avoiding them)¹². Self-compassion increases an individual's ability to conduct health-related behaviors with warmth and self-care¹². Past studies have found that self-compassion is negatively associated with worry, rumination, and psychological distress¹² and positively associated with hope¹³, psychological adjustment¹⁴, and quality of life¹⁵ among breast cancer patients.

The Transactional- Cognitive Model of Stress ¹⁶ proposes that events themselves are not stressful, the way in which individuals perceive the situation is at the heart of what causes stress. This theory classifies the perception of events as primary appraisal (referring to a person's perception of the situation as a stressful situation) and secondary appraisal (referring to how much an individual is equipped with the emotional and cognitive skills to deal with stressors). In theory, self-compassion is able to influence the process of two appraisals. For example, self-kindness assists individuals to ignore self-judgment, and focus on abilities and strengths rather than deficiencies and weaknesses ¹⁷. Common humanity helps individuals to accept their own limitations instead of thinking of shame and inadequacy ¹⁸. Mindfulness helps individuals to accept their thoughts and feeling without evaluating them, which may assist more rational perceptions of a potential stressor. Not only is there theoretical and empirical support for self-compassion diminishing stress, but research has also shown that self-compassion increases self-care behaviors ¹⁹.

Theoretically, self-compassion does not include self-criticism (the opposite of self-kindness), feelings of inadequacy, negative feelings towards self, or anger. By contrast, self-compassion involves self-acceptance beliefs, self-kindness, adaptive coping skills, and actions to alleviate suffering, that may act as a buffer in the relationship between perceived stress and self-care behaviors. The purpose of this study was to examine the relationships between perceived stress, self-compassion, and self-care behaviors, and to explore the moderating role of self-

compassion in the relationship between perceived stress and self-care behavior in women with breast cancer.

2 METHODS

2.1 Participants

A total of 210 participants were included in the study to ensure adequate power for Structural Equation Modeling (SEM), this was 5% more than the recommended sample size²⁰. All study participants were female with breast cancer (that is, women who had undergone biopsy or mastectomy) from three hospitals in Tehran, Iran with a mean age of 43.18 ± 7.4 and ranging between 27-60. Demographic information, such as types of breast cancer, stage of cancer, types of treatments, education, and marital status are presented in Table 1.

Procedure

Ethics approval was obtained from the Iranian Ministry of Health and Medical Education (code number: IR.MUI.REC.1396.1.45) as well as three hospitals in Tehran. The data was collected over a two-month period between 08 May 2018 and 19 July 2018. The participating patients had all previously been diagnosed with breast cancer in hospitals and were able to independently complete the questionnaires. A statement describing the aims of the study accompanying a consent form and the questionnaires were emailed to 380 participants. The survey did not include incentives for the participants. The participants were advised that completing the survey would take about 25 minutes and they could withdraw at any point. After the participants completed the questionnaire,

they emailed back the questionnaires to the researchers. A total of 222 questionnaires were completed. A small number (12) of participants were excluded from the study due to incomplete responses or responses displaying a significant Mahalanobis distance (less than 0.05) from the sample mean ²¹.

2.2 Measures

The Self-Compassion Scale (SCS)

The SCS is a 24-item self-report scale that measures self-compassion ²². Six components of kindness with self, self-judgment, mindfulness, over-identification, common humanity, and isolation were evaluated by this scale. The answers are based on a five point-Likert scale from 1 (*almost never*) to 5 (*almost always*). The overall score of SCS is calculated by the sum of all contributing scores. The marks range are from 24 to 120 with higher scores indicating greater levels of self-compassion. The Cronbach alpha of the Iranian version of the SCS was .88, showing good internal consistency ²³. In the present study, the Cronbach alpha for SCS was .83.

Perceived Stress Scale (PSS)

PSS is a self-reporting measure with 10 items which are used to measure recent perceived stress ⁸. This measure is based on a 4-point Likert scale where items are scored from 1 (*never*) to 4 (*very often*). Some items of this measure are reversed 9 (i.e., 4, 5, 7, and 8) so that higher score represent greater perceived stress. The Cronbach's alpha for the PSS was reported to be satisfactory in a previous Iranian study ²⁴. In the present study, the Cronbach alpha for the PSS was .89.

Self-Care Utilization Questionnaire (SCUQ)

The SCUQ is a self-reporting measure which has 30 items that evaluate the degree to which students conduct self-care behaviors, like engaging in physical activities and talking to others when stressed ²⁵. In order to complete the scale, participants are asked to read more than 30 phrases and state to what extent they engage in same behavior from 1(*never*) to 5 (*almost always*). The overall score of SCUQ is created from a sum of all scores. The marks range are from 30 to 150, higher scores demonstrate better self-care behaviors. The internal consistency of this scale showed $\alpha = .89$ ²⁵. The internal consistency, $\alpha = .88$, for the SCUQ in the present sample was also high.

2.3 Questionnaire translation and validity assessment

The SCUQ was translated from English language into Persian language and then back translated to the original language. Three experts compared the three versions of the questionnaire to ensure the equivalent content of the questionnaire. In order to assess the qualitative face validity of the Persian version of SCUQ, 10 breast cancer patients were asked about the importance of the items related to their difficulty, quantity, ambiguity, and relevancy along a 5-point Likert scale from 1 (*Not important*) to 5 (*Completely important*). The following formula was used to evaluate quantitative face validity:

$$\text{Importance} \times \text{Frequency (\%)}$$

In this formula, frequency refers to the number of participants who ascribe the score of 4 or 5 for the item, and the importance refers to the mean score for each item.

If the impact score for each item is equal to or greater than 1.5, the item is considered as acceptable²⁶. The results showed that the impact scores for all items were greater than 1.5 and all items were retained in the SCUQ measure.

The quantitative content validity was assessed using Content Validity Ratio (CVR)²⁷. A total of 8 experts (four psychologists and four endocrinologists) were asked to rate the essentiality of items based on a 3-point Likert scale (*1: not essential, 2: useful but not essential, and 3: essential*). The following formula was used to assess CVR:

$$CVR = \frac{ne - N/2}{N/2}$$

In this formula, N equals to the number of experts and ne equals to the number of experts who ascribe the score of 3 for the item. The results showed that CVR for all items were greater than the value of the Lawshe table .75 (with 8 experts), indicating that the items had acceptable content validity²⁸.

2.4 Analysis

To evaluate the study hypotheses, SEM was employed. The benefit of using SEM over other statistical methods is that it assesses and treats the variance of error, evaluates the proposed model, and calculates several paths simultaneously.

2.5 Preliminary analysis

Some introductory analyses were carried out using the Analysis of Moment Structure (AMOS version 22) software to deal with missing data and estimate normality. The rate of missing data was less than 3% and this was addressed through the regression imputation method. Normality was monitored by the skewness and kurtosis. If the values fall inside of ± 2 , they are considered to be normally distributed²⁹. The results revealed that no case was outside of the acceptable range of ± 2 .

3 RESULTS

3.1 Descriptive analysis

Descriptive statistics such as average, standard deviation, and correlation are listed in Table 2. The simple correlation yielded a negative association between perceived stress ($r = -.42, p < .01$) and self-care behaviors, and a positive association between self-compassion ($r = .51, p < .01$) and self-care behaviors. The correlation analysis also indicated a negative association between perceived stress and self-compassion ($r = -.62, p < .01$). The correlation analysis showed positive associations between age with self-compassion ($r = .21, p < .05$) and self-care behaviors ($r = .18, p < .05$), and a negative association with perceived stress ($r = -.17, p < .05$). The correlation results also displayed positive associations between chemotherapy treatment with self-compassion ($r = .2, p < .05$) and self-care behaviors ($r = .23, p < .05$), and a negative association with perceived stress ($r = -.18, p < .05$).

3.2 Measurement model for each scale

Confirmatory Factor Analysis was performed on self-care behaviors (30 items), self-compassion (24 items), and perceived stress (10 items). The CFA results revealed that the factor loading values of the items were between .52 to .89, which were above the cut-off score of .5²⁰ and were not removed from the scales. The following fit indices were used as the criteria for a well-fitted model: comparative fit index (CFI) > .90; Tucker–Lewis index (TLI) > .90; Goodness of Fit Index (GFI) > .90; Root Mean Squared Error of Approximation (RMSEA) < .08; and CMIN/df < 5³⁰. The results showed that each scale had an acceptable model fit (see Table 3).

Measurement model for all scales

The measurement model consisted of three latent variables (self-care behaviors, self-compassion, and perceived stress). The fit indices indicated that the data was a good fit for the model: CMIN/df = 4.91, $p < 0.01$, CFI = .92, GFI = .91, TLI = .90, and RMSEA = .08, showing that the latent variables could be well represented by their observed items.

3.3 Structural model

The results indicated that the structural regression model was a good fit (CMIN/df = 4.61, $p < 0.01$, CFI = .90, GFI = .90, TLI = .90, and RMSEA = .08). The structural model showed perceived stress ($\beta = -.37$, $p < .01$) negatively predicted self-care behaviors, and self-compassion ($\beta = .38$, $p < .01$) positively predicted self-care behaviors (see Figure 1). The structural model analysis yielded a negative association between self-compassion and perceived stress ($\beta = -.36$, $p < .01$). The analysis showed positive relationships between age with self-compassion ($\beta = .18$, $p < .05$) and self-care

behaviors ($\beta=.17, p<.05$), and a negative relationship with perceived stress ($\beta=-.16, p<.05$). The predicting variables explained 44% of the variance in the self-care behaviors.

3.4 Moderation test of self-compassion

The interaction-moderation approach in AMOS software^{31,32} was employed to test the moderating role of self-compassion in the relationship between perceived stress and self-care behaviors. First, all indicators of a scale were summed up. Second, in order to avoid multicollinearity, perceived stress and self-compassion were transformed to z scores (standardized score) in the SPSS software (version 22). Third, the interaction between standardized scores of perceived stress and self-compassion was executed, and data were transported into AMOS software for testing the interaction effects. If the interaction is statistically significant, it indicates a moderating effect is established^{31,32}.

There was a significant negative relationship between perceived stress and self-care behaviors ($\beta = -.39, p < .01$). The findings showed that the interaction of perceived stress and self-compassion to self-care behaviors was significant ($\beta = .19$, Critical Ratio (CR) = 3.84, $p<.001$). Therefore, self-compassion played a moderating role in the relationship between perceived stress and self-care behaviors (see Figure 2).

4 DISCUSSION

The present study aimed to examine the relationship between perceived stress, self-care behaviors, and self-compassion in women with breast cancer. Findings showed that perceived stress was a

significant negative predictor of self-care behaviors. An explanation of this finding could relate to the cognitive-transactional stress theory ¹⁶, that demonstrates the important interplay between affect, cognition and behavior. That is, cancer patients' perceptions and attitudes are likely to have a significant influence on their self-care behaviors. Negative perceptions and attitudes about cancer decrease self-care behaviors and vice versa ³³. The persistence of perceived stress may increase negative feelings, such as discomfort and anger, leading to incompatible health-related behaviors (e.g. lack of sleep, adequate rest, physical activity, and personal hygiene), and these behaviors may lead to a further adverse health effects ⁹.

The findings of this study also showed that self-compassion moderates the relationship between perceived stress and self-care behaviors. That is, self-compassion in women with breast cancer may increase their ability to manage health-related behaviors ³⁴. The results supported previous research and indicated that self-compassion was one of the important components to reduce stress and to increase self-care behaviors ³⁵. It could be concluded that, if a female breast cancer patient is able to be kind to herself during difficult periods of illness, to view adversity as a natural process and to have a balanced perspective of her health and treatment, they are more likely to be able to cope with stress and difficulties as they arise ³⁵. Furthermore, the findings of present study are in line with previous studies also showing the positive effect of self-compassion on perceived stress reduction ³⁶. In general, self-compassion could buffer the effects of stress during times of adverse conditions, such as breast cancer ³⁷. Self-compassion may also reduce stress by alleviating the sense of hopelessness in patients with breast cancer ³⁸.

4.1 Clinical implications

The results of the current study show the crucial role of self-compassion in enhancing self-care behaviors in female breast cancer patients, who experience high perceived stress. Aiming to increase or maintain self-compassion in female breast cancer patients could help psychologists, nurses, and physicians to manage the perceived stress in these patients and improve their willingness to take part in self-care behaviors. Studies demonstrated that engaging in self-care behaviors plays an important role in increasing the quality of life of female breast cancer patients²⁵. Although this study is not an intervention, it is conceivable that by increasing self-compassion, self-care behaviors in breast cancer patients would be increased. Self-compassion interventions for women with breast cancer are not widely used, yet have a growing body of empirical work suggesting they have merit for improving mental health and wellbeing outcomes for patients. Previous research has provided evidence for the usefulness of self-compassion interventions to reduce psychological distress and negative body image among breast cancer patients³⁹. Therefore, the impact of such interventions on these patients should be evaluated in future studies on other protective variables such as self-care behavior.

4.2 Research limitations

A limitation of the present study is that the present results should be interpreted with caution due to their lack of generalizability to all female breast cancer patients. The data were collected from a small number of patients and from one region (Tehran). In addition to this, the disease stage, status, and type of treatment received (radiation, chemotherapy) by patients were not included in the

inclusion criteria. A patient undergoing their first session of chemotherapy, for example, may be yet to experience the adverse side effects of treatment and may view self-compassion differently to someone who has a more advanced stage of breast cancer. In this study, the age range of the participants was from 27 to 60 years old. It is possible that the breast cancer patients over the age 60 did not access to technology to accept information through email. Future studies could collect data from the breast cancer patients over the age 60 using different methods such as interview. We have searched about studies of cultural differences of the research variables. However; we have not found any study on cultural differences of the research variables. Future studies could examine about cultural differences of the research variables among women with breast cancer.

Conclusions

Taken together, the findings of this research which sought to examine the relationship between perceived stress, self-compassion, and self-care offers important preliminary insights for future research and clinical practice. The growing body of work that demonstrates the importance of self-care and self-compassion in breast cancer treatment suggests that self-care and self-compassion interventions should be urgently considered within the scope of health care policy and clinical practice.

Compliance with Ethical Standards

This study protocol was approved by the the Alzahra University.

Conflict of interest The author(s) asserted no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Data Availability Statement³⁹ The data that support the findings of this study are openly available in figshare at [https://figshare.com/articles/Self
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TABLE 1. Demographic data of patients with breast cancer

Variable	Number	Percentage
Types of breast cancer		
Invasive ductal carcinoma	170	81
Lobular carcinoma	18	9
Medullary carcinoma	11	5
Comedo-carcinoma	8	4
Tubular carcinoma	3	1
Breast cancer stage		
Stage I	125	59
Stage II	60	29
Stage III	23	11
Stage V	2	1
Types of treatments		
Chemotherapy	155	74
Radiation treatment	147	70
Hormone treatment	164	78
Reconstructive surgery	73	35
Time since diagnosis		
≤ 1 Year	70	33
1-2 Years	61	29
2-5 Years	52	25
> 5 Years	27	13
Education		
Under Diploma	33	16
Diploma	54	26
Bachelor	86	41
Master	28	13
Doctoral degree	9	4
Marital status		
Married	190	90
Divorced	15	8
Single	5	2

TABLE 2. Correlations, means, standard deviations, and real range of the study variables

	Mean	SD	Self-compassion	Perceived stress	Self-care behaviors
Self-compassion	56.1	9.25			
Perceived stress	24.3	5.23	-.56**		
Self-care behaviors	61.9	7.35	.65**	-.42**	
Time Since Diagnosis	9.2	5.3	-.04	-.05	-.03
Age	43.2	7.4	.21*	-.17*	.18*
Chemotherapy			.2*	-.18*	.23*
Radiotherapy			-.03	.08	.06
Hormone therapy			-.04	.05	-.05
Reconstructive surgery			.07	-.12	.06

Note: *P<.05, **p<.01, and without * >.05

TABLE 3. Measurement Model for each scale

Measurement Model	CMIN/df	RMSEA	CFI	GFI	TLI
Self-compassion	3.14	.06	.92	.93	.91
Perceived stress	2.91	.05	.93	.94	.92
Self-care behaviors	4.11	.07	.92	.92	.93

FIGURE 1. Structural model for the self-care behaviors. Note: $^*P<.05$ and $^{**}p<.01$

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FIGURE. 2. Self-compassion as a moderator in the relationships between perceived stress and self-care behavior.

PON_5369_Figure 2.PNG

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