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Clarifying the Role of Emotional Self-regulation Strategies and Health Anxiety in Predicting Negative and Positive Reactions to Stress, Psychosomatic Symptoms, and Quality of Life Indicators in Women with Breast Cancer

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Quantitative Study

Abstract

Background: Today, one of the most challenging diseases that mankind is facing is cancer. The present study aimed to explain the prediction model of negative and positive reactions to stress, psychosomatic symptoms, and quality of life (QOL) indicators based on emotional self-regulation strategies (SRS) and health anxiety in women with breast cancer.
Methods: The current research was of a correlational type, which was conducted by structural equation modeling (SEM) using the path analysis method. The statistical population included all women with breast cancer in hospitals of Tehran, Iran, and 485 women with breast cancer, who visited medical centers and hospitals in the second half of 2021, were selected by purposive sampling. The questionnaires used in this research included Psychosomatic Disorders Questionnaire, World Health Organization Quality of Life Questionnaire (WHOQOL), Stress Reaction Questionnaire, Post-Traumatic Growth Inventory (PTGI), and Cognitive Emotion Regulation Questionnaire (CERQ). In the descriptive part, the data were analyzed using mean and standard deviation (SD), and in the inferential part, Pearson's correlation coefficient and path analysis were used via SPSS and Amos software.
Results: The desired model had a favorable fit in terms of statistics, and it was also found that the emotion regulation strategies and health anxiety were able to provide a meaningful explanation for the paths of predicting positive and negative reactions to stress symptoms to have mental health and QOL [root mean square error of approximation (RMSEA) = 0.039, goodness of fit index (GFI) = 0.92].
Conclusion: It can be concluded that in the treatment of people with cancer, paying attention to psychological and emotional indicators can be of great importance.
Keywords: Quality of life; Breast neoplasms; Anxiety; Female

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Introduction

Breast cancer is the result of uncontrolled and malignant growth of cell masses lining the ducts or lobules of breast tissue in women (and in rare cases in men). These malignancies constitute about 33% of women's cancers and their prevalence in the general population of different countries of the world is estimated between 8%-10% in the age range of 40-44 years (Badrian, Ahmadi, Amani, & Motamedi, 2014). In the world, more than one million cancers are diagnosed annually and 600000 people die from them (Huang, Zhang, An, & Xu, 2019). In Iran, it ranks third in terms of disease burden and fifth in terms of the cause of death with a ratio of 4 per hundred thousand people (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

Nowadays, paying attention to the components of quality of life (QOL) is considered one of the important consequences of the treatment of diseases and is evaluated as one of the determining indicators of treatments (Eisenberg et al., 2001). Menin et al.'s research shows that people who cannot effectively manage their emotional responses to everyday events experience more intense and longer periods of psychological distress (Liverant, Brown, Barlow, & Roemer, 2008). For this reason, there is a need for people to learn skills to think in more adaptive ways and act more resiliently when faced with problems and stressful situations.

Unpleasant consequences arising from incompatible coping with stress in patients have reduced their QOL, which is considered a very important point in studying the psychological conditions of patients with cancer (Furat Yazdi et al., 2016). Mahan (2014) investigated and clarified psychosocial factors and the relationships between illness, health, and recovery and emphasized the relationship between psychosocial stress and the body's immune system, and stated that there were important differences in people's ways of perceiving and responding to environmental events and even events that are created internally, and one of these responses is the type of stress reaction (Heidarzadeh, Rassouli, Mohammadi, Alavi, Mirzaei, & Tahmasebi, 2015).

The cognitive model of post-traumatic stress disorder (PTSD) is based on the assumption that people suffering from this disorder are unable to process or justify the trauma that has accelerated the disorder. They continue to experience stress and try to withdraw from experiencing stress again with coping methods. Experiencing alternating periods of acknowledging and denying the event is consistent with their relative cognitive ability with the event (The WHOQOL Group, 1995). In the psychoanalytical model of this disorder, it is also assumed that the trauma causes the reactivation of a previously silent but unresolved conflict. Revival of childhood trauma leads to regression and the use of defense mechanisms of suppression, denial, and invalidation. The actions used by the ego to control anxiety and reduce it are repeated. Moreover, the victim gains secondary benefits from the outside world, which common types include material compensation, increased attention and sympathy, and satisfaction of dependency needs. These benefits strengthen the disorder and its durability (The WHOQOL Group, 1995).

Based on this, one of the harms of stressful factors is jeopardizing a person's mental health and causing mental disorders. The role of mental and social stress has been mentioned as one of the most important factors in the emergence and formation of various physical and mental diseases and the death of people. In this context, it is possible to refer to the connection of stressful events with the heart, skin, immune system, and diseases such as gastric ulcers and cancer. Health anxiety is a disorder that is characterized by great anxiety and fear about having a serious illness; therefore, the main problem in this disorder is anxiety, the form of which is different from other

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anxiety disorders. Health anxiety is a continuum concept that was first proposed by Salkovskis and Warwick (Bar-On, 2006). On one side of the continuum, there are mild worries about health and getting sick, and on the other side, self-diagnosis disorder is characterized by extreme fears and sometimes delusions about health and physical symptoms (Lopes & Osorio, 2023). Salkiskis believes that health anxiety is caused by catastrophic misinterpretations of physical signs and symptoms (Shi et al., 2015).

One of the concepts that are strongly related to anxiety in patients with cancer is the self-regulation component (Kashdan & Rottenberg, 2010), which is directly related to the components related to health promotion and is particularly important in controlling mental health (Khamoshi Darmarani & Moradi, 2018). Since emotion regulation is considered a basic principle in starting, evaluating, and organizing adaptive behavior and also preventing negative emotions and maladaptive behaviors (Garnefski & Kraaij, 2007). Theorists believe that people who are unable to properly manage their emotions in the face of everyday events show more diagnostic symptoms of internalizing disorders such as depression and anxiety (Mahan 2016). Therefore, it can be said that emotion regulation is a key and determining factor in psychological well-being and effective functioning (Garnefski & Kraaij, 2007), which plays an essential role in adapting to life's stressful events (Moradi, Afrazizadeh, & Asadzadeh, 2015).

It seems that there is a kind of chain relationship between emotional stressors and the cognitive system of people regarding cancer. Since the high prevalence of cancer, especially breast cancer, among women has been noticed, which has a high prevalence in societies, it is necessary to investigate the psychological consequences of this disease in detail. Therefore, this research aims to model the role of emotional self-regulation strategies (SRS) in predicting the reaction to stress, psychosomatic symptoms, and QOL indicators in women with breast cancer.

Methods

The current research was of a correlational type, which was conducted by structural equation modeling (SEM) using the path analysis method. The statistical population included all women with breast cancer in hospitals of Tehran, Iran, and 485 women with breast cancer, who visited medical centers and hospitals in the second half of 2021, were selected by purposive sampling. In the pre-test stage, the sample members completed the emotional SRS questionnaire, the post-traumatic growth and PTSD syndrome questionnaires to assess people's reactions to stress, as well as the World Health Organization Quality of Life Scale (WHOQOL) and psychosomatic symptoms.

Ethical considerations included coordinating and obtaining permission to enter the environment, explaining the purpose of the research, the method of completing the questionnaires and the right of the participants to participate in the study or refuse them, assuring the participants about the confidentiality of personal information, and obtaining informed consent to participate in the study.

Psychosomatic Disorders Questionnaire: This questionnaire is self-report and measures the intensity of psychosomatic symptoms experienced by the individual and has 20 items that are answered on a 5-point Likert scale. Moher has mentioned the internal reliability of this questionnaire in different studies and with different samples between 0.7 and 0.93 (Mineka & Sutton, 1992). In Iran, Babamiri has reported the reliability of this questionnaire using Cronbach's alpha method of 0.89 and its factorial validity as appropriate (Brackett & Geher, 2013).

WHOQOL Scale: This questionnaire measures the four areas of physical health,

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mental health, social relations, and environmental health with 24 questions. The questionnaire has two other questions that do not belong to any of the areas and evaluate the health status and QOL in a general way; thus, this questionnaire has a total of 26 questions. After performing the necessary calculations in each area, a score equal to 4-20 will be obtained for each area separately, where 4 is the worst and 20 is the best condition of the desired area. These points can be converted into a score with a range of 0-100. The four subscales of this questionnaire are physical health, psychological health, social relations, and environmental health. This questionnaire was examined in Iran by Nejat et al. (2015) using the intra-cluster correlation index of the questionnaire in a retest after two weeks in the range from 0.75 to 0.84. On the other hand, the values of Cronbach's alpha and indices related to construct validity also indicated the acceptable validity of this test in the population of Iran and it was as follows: physical health = 0.77, mental health = 0.77, social relations = 0.75, environmental health = 0.84 (Fazel Hamedani & Ghorban Jahromi, 2017).

Stress Reaction Questionnaire: The PTSD checklist is a self-administered 17-question questionnaire that covers all dimensions of this disease based on the symptoms presented in the Diagnostic and Statistical Manual of Mental Disorders (DSM). In this questionnaire, three categories of symptoms of re-experiencing (5 items), avoidance symptoms (7 items), and symptoms of intense arousal (5 items) are asked from the patient. The validity and reliability of this questionnaire have been evaluated in various kinds of research. The scoring method is Likert scale from one to five and the score of all items (17-85) is considered an individual score. A score of 35 is considered the cut-off point in most research (Ghalyanee, Asadzandi, Bahraynian, & Karimi Zarchi, 2021). The validity and reliability of this test have been confirmed in Iran (Isanejad, Gharib, Ghanbari Motlagh, & Nazari, 2020). To check the reliability of the reliability coefficient obtained from the retest method after one to two weeks from the initial implementation, 0.58 was obtained for the whole scale, and this value was 0.92 for the re-experiencing criterion, 0.27 for the avoidance criterion, and 0.27 for the extreme arousal criterion. It is 0.74. The internal consistency and alpha were 0.92 and the retest reliability and kappa were 0.74 (Prapa, Papathanasiou, Bakalis, Malli, Papagiannis, & Fradelos, 2021).

Post-Traumatic Growth Inventory (PTGI): This questionnaire is a self-assessment tool that was created by Tedeschi and Calhoun (2004) to evaluate the changes in people's self-perception related to the experiences of traumatic events. This questionnaire consists of 21 statements on a Likert scale with a range of zero to five, and the range of subjects' scores is between 0 and 105. Tedeschi and Calhoun (2004) obtained the reliability of this instrument using Cronbach's alpha equal to 0.96 and its convergent validity was significant through the relationship with religiosity, optimism, and the main dimensions of NEO personality. In Iran, Seyed Mahmohkhodi (2013) obtained the reliability of this tool with Cronbach's alpha method equal to 0.92 and its retest reliability equal to 0.94.

The Cognitive Emotion Regulation Questionnaire (CERQ): This questionnaire is a 36-item tool that measures the cognitive regulation strategies of emotions in response to threatening and stressful events in life on a five-point scale from one (never) to five (always) according to the following 9 subscales: blaming self, blaming others, rumination, catastrophizing, positive refocusing, planning refocusing, positive reappraisal, broad perspective, and acceptance. A higher score indicates a person's greater use of that cognitive strategy. The alpha coefficient for the subscales of this questionnaire was reported by Garnefski and Kraaij (2007) in the range of 0.71 to

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0.81 and the reliability coefficient of its subscales in the retest method at a time interval of 14 months in the range of 0.48 to 0.61 (Etemadi & Arianfar, 2017). In Iran, the alpha coefficient for the subscales of this test has been obtained in the range of 0.62 to 0.91, as well as the reliability coefficient of these factors in the retest method with a time interval of one week between 0.75 and 0.88.

In the descriptive part, the data were analyzed using mean and standard deviation (SD), and in the inferential part, Pearson's correlation coefficient and path analysis via SPSS (version 22, IBM Corporation, Armonk, NY, USA) and Amos software (version 22) were used.

Results

By examining the questionnaires completed by the members of the research sample, the distorted questionnaires were removed from the analysis process, and in this way, 459 questionnaires were finally analyzed and examined.

Most of the patients were married (n = 289, 63%), and the number of patients receiving chemotherapy (n = 253, 55%) was more than the patients receiving radiation therapy (n = 94, 20%) and surgery (n = 112, 25%). It was also found that the number of patients with self-employment was higher.

The highlighted houses in Table 3 indicate the non-significance of the correlation of that subscale with the corresponding component. The goodness of fit of the proposed model was evaluated based on the chi-square index (χ^2), comparative fit index (CFI), goodness of fit index (GFI), adjusted GFI (AGFI), and root mean square error of approximation **(**RMSEA**)**.

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Table 1. Correlation of variables and subscales included in the research model (Part I)

Variables	1	2	3	4	5	6
Positive SRS	1					
Negative SRS	0.34**	1				
Re-experiencing	-0.34**	0.58**	1			
Avoidance	-0.61**	0.22**	0.73**	1		
Intense arousal	0.40**	0.55**	0.47**	0.41**	1	
PTG	0.29**	-0.58**	-0.44**	0.43**	-0.68**	1
Physical health	0.27**	-0.21*	-0.21*	0.40**	0.31**	0.38**
Mental health	0.27**	-0.26**	-0.21*	-0.46**	0.52**	0.50**
Environmental health	0.34**	0.44**	-0.96**	-0.10*	0.38**	0.32**
Community relations	-0.35**	-0.70**	0.62**	0.26**	-0.03	0.25**
Psychosomatic symptoms	-0.31**	-0.28**	0.26**	0.28**	0.31**	-0.28*
Health anxiety	-0.27**	0.26**	0.31**	0.21*	0.35**	-0.43*

Table 1. Correlation of variables and subscales included in the research model (Part II)

Variables	7	8	9	10	11	12
Positive SRS						
Negative SRS						
Re-experiencing						
Avoidance						
Intense arousal						
PTG						
Physical health	1					
Mental health	0.56**	1				
Environmental health	0.46**	0.60**	1			
Community relations	0.60**	0.62**	0.76**	1		
Psychosomatic symptoms	-0.35*	-0.18*	-0.15*	-0.23*	1	
Health anxiety	0.22*	-0.27**	-0.23*	0.19*	0.27**	1

SRS: Self-regulation strategies; PTG: Post-traumatic growth

The results of the structural equation analysis were as follows: degree of freedom (DF) = 25, χ^2 = 43.212, χ^2/DF = 1.728, RMSEA = 0.039, GFI = 0.922, AGFI = 0.908, CFI = 0.901 (P = 0.001).

The χ^2/DF ratio was less than 2.5 and the RMSEA value was close to zero. Moreover, the value of GFI, AGFI, and CFI was close to one. As a result, the presented model with a probability value of 0.000 had a good fit and validity.

Table 2 shows the amount of direct, indirect, and total effects of each structure compared to the variables defined in the path. Based on this, the direct and indirect effects have been investigated, and according to the highlighted cases that represent the paths that could not be statistically significant, it was found that SRS in total had many paths to explain the predictor variables as have statistically significant paths.

Discussion

This study aimed to model the role of emotional SRS in predicting stress response, psychosomatic symptoms, and QOL indicators in women with breast cancer. The obtained findings show the significance of predicting paths to stress response, psychosomatic symptoms, and QOL indicators based on emotion regulation strategies, except for the subscales of physical health and social relations for both emotion regulation and avoidance strategies. Self-regulation is negative. This finding is in line with the results obtained by Huang et al. (2019), who found that emotion regulation strategies had a significant relationship with the type of reaction to stress among people when they experienced stress. According to their view, cognitive reappraisal is a background-focused coping strategy by which people change their interpretation or evaluation of emotional stimuli and shift their focus away from the negative aspects of an emotional event.

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Table 2. Direct, indirect, and total effects for explaining the model

Paths	Beta	Direct	P-value
Positive SRS for re-experiencing	0.381	1.235	0.021
Positive SRS for avoidance	0.324	1.262	0.014
Positive SRS for intense arousal	0.387	1.239	0.011
Positive SRS for PTG	0.310	1.238	0.035
Positive SRS for physical health	0.196	0.653	0.134
Positive SRS for mental health	0.439	1.373	0.017
Positive SRS for environmental health	0.299	0.985	0.048
Positive SRS for social relations	0.209	0.726	0.106
Positive SRS for psychosomatic symptoms	0.360	1.198	0.043
Negative SRS for re-experiencing	0.241	1.185	0.048
Negative SRS for avoidance	0.128	0.736	0.095
Negative SRS for intense arousal	0.361	1.216	0.031
Negative SRS for PTG	0.236	1.197	0.043
Negative SRS for physical health	0.181	0.811	0.083
Negative SRS for mental health	0.256	1.244	0.041
Negative SRS for environmental health	0.260	1.296	0.038
Negative SRS for social relationships	0.184	0.869	0.078
Negative SRS for psychosomatic symptoms	0.264	1.262	0.041
Health anxiety to re-experiencing	0.274	1.285	0.029
Health anxiety to avoidance	0.176	0.774	0.116
Health anxiety to intense arousal	0.319	1.368	0.017
Health anxiety to PTG	0.327	1.248	0.028
Health anxiety to physical health	0.197	0.967	0.097
Health anxiety to mental health	0.346	1.314	0.014
Health anxiety to the health of the environment	0.288	1.119	0.031
Health anxiety to social relationships	0.177	0.746	0.126
Health anxiety to psychosomatic symptoms	0.336	1.322	0.011

SRS: Self-regulation strategies; PTG: Post-traumatic growth

It shows its positive side before the emotional responses are fully evoked. In contrast, expressive suppression is considered a response-focused strategy that involves consciously inhibiting one's emotional expressions after their emotional responses are fully activated, as an attempt to suppress emotions (Wang, Zheng, Duan, Li, & Li, 2022). Since the reconstruction of the cognitive process leads to positive changes, by reinterpreting the traumatic event and paying attention to its positive side, the injured people can become more aware of the power in themselves and the support of others, reconsider the value of life, and make more informed choices (Zhou, Wu, An, & Chen, 2014)**.** Also, the findings obtained by Kowalika et al. (2014)

Additionally, in line with these findings, it is indicated that emotional self-regulation has a positive relationship with patients' well-being. Emotional responses after a crisis are adaptive and normative, as long as functioning and the ability to lead a satisfying life remain intact (Tedeschi & Calhoun, 2004), because managing distress through avoidance, distancing, or extensive involvement in safety behaviors limits people's ability to stay involved in valuable activities, and as a result, reduces life satisfaction and a negative mindset (Kashdan & Rottenberg, 2010). Based on this, it can be said that emotion regulation refers to the processes through which people pay attention to their feelings and emphasize when and how to express them. Therefore, people try to make life conditions interpretable for themselves by focusing on prediction to change the meaning and emotional impact of a specific situation and focused response to try to understand the meaning of the situation in question (Yildiz & Duy, 2019)**.** Finally, Yildiz and Duy (2019) found that emotion regulation strategies were significant predictors of symptoms related to psychosomatic disorders. In line with these findings, it can be said that since emotion regulation can maintain an emotion, aggravate, or prevent it (Goossens, 2020), if we consider the two main processes in emotion regulation to be re-evaluation and suppression, through a re-evaluation of emotions appropriate to the situation, people rebuild their emotional views and reduce stress. Repression also inhibits the emergence of emotion. Emphasizing that repression reduces overt states such as pain, pride, and amusement (Liverant et al., 2008), emotion dysregulation is a clear symptom of multiple psychopathologies (Ghalyanee et al., 2021), and in different cases, such as mood and anxiety disorders, emotional disorder is at the forefront of the definition of disorders based on Hey Johnat being dysfunctional (Mineka & Sutton, 1992; Bender, Reinholdt-Dunne, Esbjorn, & Pons, 2012). Eisenberg et al. (2001) found that people with psychosomatic complaints were prone to sadness, anger, and impulsive issues and were unsuccessful in regulating their emotions.

One of the limitations of this research is the presence of disturbing variables such as the marital status and employment of the sample. Besides, the limitation of this research to the city of Isfahan, Iran, makes it necessary to be cautious in generalizing the results to other cities. It is suggested that researchers interested in the field of psychological problems of patients with cancer should investigate the role of metacognitive variables and antecedent factors such as defense mechanisms and personality traits. The results of this research can be used in developing intervention protocols for psychological treatments of patients with cancer.

Conclusion

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Conflict of Interests

Authors have no conflict of interests.

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