

Original Article

Middle East Journal of Cancer; April 2017; 8(2): 93-101

Examining the Predictive Role of Emotional Self-Regulation in Quality of Life and Perception of Suffering among Patients with Breast Cancer

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Abstract

Background: Breast cancer is the most common type of cancer and second leading cause of death in women after lung cancer. The World Health Organization has reported that breast cancer, with 502,000 deaths in 2005, surpassed lung, stomach, colorectal, and cervical cancers as the leading cause of death in women. The main objective of the current study was to examine the predictive role of emotional self-regulation in quality of life and perception of suffering among patients with breast cancer.

Methods: This was a descriptive-analytical study followed by a correlational design. The sample population consisted of 42 patients with breast cancer selected by the census method. Participants completed questionnaires on emotional self-regulation, quality of life (Aaronson et al., 1987), and perception of suffering. The obtained data was statistically analyzed using the Pearson correlation coefficient and regression analysis via SPSS 22.

Results: There was a significant, positive association between emotional self-regulation and the functional and general dimensions of quality of life. A significant, inverse correlation existed between emotional self-regulation and the symptoms dimension of quality of life. The results of the enter regression analysis showed that self-regulation respectively predicted 0.18 of variance in the functional, 0.26 in symptoms, and 0.37 of the variance in the general health dimensions of the quality of life. Emotional self-regulation had a significant, diverse relationship to the physical, psychological, and existential dimensions of perception of suffering. The results of the regression analysis carried out to predict perception of suffering indicated that emotional self-regulation respectively predicted 0.33 of variance in the physical, 0.19 in psychological, and 0.06 of the variance in the existential dimensions of perception of suffering.

Conclusion: A major step forward can be taken towards improving the level of quality of life among breast cancer patients through the use of books and educational brochures, individual and group counseling sessions associated with emotional self-regulation, and encouragement of patients to participate in cultural and sports activities.

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Introduction

Cancers comprise a wide range of diseases, each of which has its own etiology, treatment, and prognosis.¹ Among various types of cancers, breast cancer is the most prevalent and lethal type of cancer in women.² In Iran, breast cancer constitutes 26.22% of all cancer cases in women and is the most prevalent cancer among Iranian women.³ Since it affects all dimensions of quality of life including physical and mental health, and social well-being, it is important to pay attention to the risk for developing breast cancer.⁴

Breast cancer diagnosis, treatment, and recurrence can bring about harmful effects on patients' quality of life.⁵ Quality of life is considered as an important finding achieved from conducting clinical trials and health interventions. The World Health Organization defines quality of life as individuals' perceptions of their positions in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. This includes a wide range of perceptions which can be affected in different ways by physical and psychological status, personal beliefs, and social relationships.⁶ In recent years, quality of life assessment among cancer patients has received tremendous attention. In all cases, cancer affects varying degrees of patients' quality of life.⁷

Suffering is an integral part of human life experienced by people in various social and cultural circumstances. In order to adapt and overcome suffering, people try to understand, explain, interpret, and give a meaning to suffering.⁸ Several factors influence patients' perceptions of suffering. Therefore, emphasizing the catastrophic effects of cancer on both the patient and his/her family is significant.⁹

Emotional self-regulation is a structured effort to regulate thoughts, feelings, and actions to achieve specific objectives. Although all goals in life are not the same, the ability to self-regulate creates harmony among objectives. In other words, self-regulation requires sacrificing one goal for other goals. A previously conducted study has shown that positive emotions facilitate self-

regulation and negative emotions harm self-regulation.¹⁰ Another study has indicated that nearly one-third of cancer patients suffer from mental distress and have low levels of functional health.¹¹ In another study, 18% of women with primary breast cancer have been reported to suffer from anxiety or diagnosed depression at the time of treatment.¹² Researchers reported that the nature of cancer, anxiety, and inappropriate emotional responses significantly and diversely correlated with quality of life.¹³ In the same line, a study conducted on 313 patients with incurable cancer aimed to describe their quality of life during the process of dying and identify factors that affected patients' quality of life. They reported that the lower the patient's quality of life, the more he/she experienced physical pain, anxiety, and depression.¹⁴ The researchers concluded that illness perception was an independent factor that affected patients' quality of life.¹⁵ Another study reported a relationship between emotional self-regulation and the perception of suffering.¹⁶ Others demonstrated that women who obtained high scores on emotional recovery experienced low levels of emotional suffering.¹⁷ Additionally, the experience of suffering among ill women at high risk of death showed that the patients' experiences of suffering could include physical, social, and spiritual suffering.¹⁸ Research on personality traits of women with breast cancer indicated that these women had low levels of self-esteem, inappropriate expression of emotions which included aggressive behaviors, high levels of perceived pain, and poor quality of life.¹⁹ Emotion-focused coping strategies showed a significant, positive relation to quality of life among patients with breast cancer. In this research, the emotional aspect of pain significantly and diversely correlated with the functional dimension of quality of life.²⁰ Researchers examined the effectiveness of training coping skills on the level of pain and quality of life among patients with breast cancer. They reported that training coping skills improved functional and symptoms dimensions of quality of life among patients with breast cancer.²¹ The results of another study showed that positive

Table 1. The means and standard deviations of the dimensions of quality of life, self-regulation and perception of suffering.

Variables	Dimensions	Mean	SD	Questionnaire's mean
Quality of life	Functional	28	9.34	22
	Symptoms	27.64	6.32	34
	General	10.78	2.45	7
Self-regulation	Self-regulation	65.59	10.77	62.5
Perception of suffering	Physical	7.30	5.57	13.5
	Psychological	27.38	8.02	22.5
	Existential	16.7	2.69	13.5

affect among cancer patients had a significant association with high levels of general health, good social functioning, positive changes, low levels of depression and anxiety, and high levels of mental health.²² Along the same line, the results of a study indicated a strong correlation between negative emotions (hatred, anger, and humiliation) and quality of life among cancer patients. This has indicated a need for early intervention aimed to assist women with cancer to help them have a better understanding of their potential for negative emotions and showed that emotional suppression might affect quality of life and emotional self-regulation.²³

Emotional self-regulation plays a key role in adjustment with stressful events in life. Given the fact that positive coping strategies reduce emotional distress among cancer patients, the present study has sought to determine the following fundamental question. Is emotional self-regulation a predictor of quality of life and perception of suffering among patients with breast cancer?

Materials and Methods

This was a descriptive-analytical study followed by a correlational design. The statistical population included all patients with breast cancer who referred to oncology treatment centers in Zahedan during 2016. The sample under study consisted of 42 patients with breast cancer selected using the census method with a confidence coefficient of 0.95 and a power of 0.80, such that all female patients diagnosed with breast cancer who started treatment were selected using the census method. Inclusion criteria consisted of a

breast cancer diagnosis, female, experience with breast cancer for at least 6 months, chronological age of 25 to 60 years, under treatment, and no other diseases. Exclusion criteria were: lack of interest in study participation, abandoning the treatment process, presence of a simultaneous disease, and mental illness. Patients were informed about the goals and stages of the study so that their participation was voluntary. Afterwards, the questionnaires were distributed among the patients. In cases where a question seemed vague, we provided additional explanations. Of note, the explanations were provided to avoid any type of ambiguity and/or bias. All participants' information was undetectable since we assigned a code to each patient. Research instruments included the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire, Emotional Self-Regulation Inventory (SRI), and the Experience and Perception of Suffering Scale.

The European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire

This 30-item questionnaire which evaluates quality of life among patients with various cancers was developed by Aaronson in 1987. This scale examines three quality of life dimensions - functional, symptoms, and general among patients with cancer. The functional dimension constitutes 5 subscales of physical functioning, role playing, emotional functioning, cognitive functioning, and social functioning. The symptoms dimension includes 9 subscales - fatigue, pain, nausea and vomiting, shortness of breath, diarrhea,

constipation, insomnia, loss of appetite, and economic problems caused by the disease and treatments received.²⁴ Subjects choose their answers based on a 4-point Likert-type scale that ranges from never (1) to always (4). High scores in the functional dimension indicate a preferred functional level and high scores in the symptoms dimension indicate severe symptoms. The physical function dimension consists of 17 questions with a scale from 1 to 4. The least score is 17 and the highest score is 68. The functional dimension has 11 questions with a scale from 1 to 4. The general quality of life dimension has 2 questions with a score from 1 to 7, such that the least possible score is 2 and the highest is 14. The results of a study conducted by Wan et al. have examined the reliability and validity of this scale. The researchers reported reliability of the questionnaire as follows: physical functioning (0.77), role playing (0.85), emotional functioning (0.61), cognitive functioning (0.71), and social functioning (0.88). Reliability of the subscales of the symptoms dimension was as follows: fatigue (0.63), pain (0.61), nausea and vomiting (0.68), shortness of breath (0.56), diarrhea (0.54), constipation (0.51), insomnia (0.61), loss of appetite (0.53), and economic problems caused by the disease and received treatments (0.53).²⁵ In another study, Safaei et al. examined the alpha coefficient of physical functioning (0.76), role playing (0.77), emotional functioning (0.77), cognitive functioning (0.77), social functioning (0.73), fatigue (0.65), pain (0.66), nausea and vomiting (0.69), shortness of breath (0.62), diarrhea (0.60), constipation (0.51), insomnia (0.65), loss of appetite (0.60), and economic problems caused by the disease and received treatments (0.61).²⁶

The Emotional Self-Regulation Inventory (SRI)

Marques et al. developed this 25-item inventory.²⁷ This inventory examines 5 dimensions of emotional self-regulation - positive actions, controllability, expression of feelings and needs, assertiveness, and well-being seeking. The SRI is scored based on a 5-point Likert-type scale that

Table 2. The results of the Pearson correlation coefficient of the dimensions of quality of life and perception of suffering with self-regulation.

Variables	Self-regulation	
	R	
Dimensions of quality of life	Functional	**0.45
	Symptoms	**-0.52
	General	**0.62
Self-regulation	Self-regulation	1
Dimensions of perception of suffering	Physical	**-0.58
	Psychological	**-0.46
	Existential	*-0.30

*: P<0.05; **: P<0.001

ranges from 1 to 5, with a minimum score of 25 and maximum score of 125. The higher the score of a respondent, the higher the levels of related emotional self-regulation and skills.²⁷ A study conducted on a sample of students (N=827) validated the Persian version of this inventory. The results showed an alpha coefficient of the entire inventory of 0.93; the alpha coefficient of male subjects was 0.91, whereas for female subjects, it was 0.92 which indicated the high internal consistency of this inventory. The correlation coefficients among scores of numerous subjects (77 females and 63 males) examined twice within two weeks were 0.86 (entire scale), 0.84 (males), and 0.88 (females), which showed good test-retest reliability of this inventory. The correlation coefficient among the scores of subjects on mental health and the self-esteem rating scale conducted on 140 students (77 female and 63 males) confirmed the validity of the emotional self-regulation inventory.²⁸

The Experience and Perception of Suffering Scale

Schulz et al. (2010) developed this scale.²⁹ The scale measures three dimensions of suffering - physical, psychological, and existential-spiritual. The dimension of physical suffering includes 9 items and 2 parts. In the first part, subjects are asked to indicate how much they have experienced the mentioned symptoms in the previous 7 days. In the second part, subjects are asked to demonstrate how much each mentioned symptom is upsetting and stressful. Subjects can choose

Table 3. Enter regression analysis conducted to predict dimensions of quality of life.

Criterion variable	Predictor variable	R	R2	Adjusted R square	B	T	F (df)
Dimensions of quality of life	Functional	Self-regulation	0.45	0.20	0.18	0.45	*3.24 (40,1)
	Symptoms						
	General						

*: P>0.001

their answers based on a 4-point Likert-type scale that ranges from never (0) to always (3). The physical dimension has a minimum score of 0 and a maximum of 27. The dimension of psychological suffering contains 15 items. In the items related to psychological suffering, subjects are asked to indicate how often they have experienced the listed excitements in the last 7 days. Subjects can choose an answer that ranges from never to always. Participants can choose their answers based on a 4-point Likert-type scale from never (0) to always (3). In the psychological dimension, the minimum score is 0 with a maximum score of 45. The existential-spiritual suffering component consists of 9 items. The subjects are asked to indicate to what extent the statements related to their feelings in the last 7 days are true. Responses are based on a 5-point Likert-type scale that ranges from never (0) to very much (4). In the physical dimension, the minimum score is 0 with a maximum score of 27.²⁹ The reliability of this scale has been examined and confirmed by Schulz et al. in three groups of African-Americans (physical 0.63, psychological 0.9, and existential-spiritual 0.86), Caucasians (physical 0.43, psychological 0.87, and existential-spiritual 0.84), and Spanish individuals (physical 0.6, psychological 0.85, and existential-spiritual 0.83).²⁹ Askari and Nikmanesh evaluated the Cronbach's alpha coefficient of this scale and its subscales in a sample of Multiple Sclerosis patients. The results indicated that the Cronbach's alpha coefficients were as follows: physical (0.71), psychological (0.84), and spiritual (0.81) dimensions.³⁰ In the current study, the Cronbach's

alpha coefficients were: physical (0.78), psychological (0.89), and existential-spiritual (0.61).

We used the Pearson correlation coefficient and enter regression analysis to statistically analyze the main hypothesis of the current study which was the predictive role of emotional self-regulation in quality of life and perception of suffering among patients with breast cancer. The obtained data were analyzed using SPSS 22.

Results

Given the level of significance in relation to the assumption of normality of the data, we sought to examine all variables: emotional self-regulation, quality of life dimensions (functional, symptoms, and general), and perception of suffering dimensions (physical, psychological, and existential). The functional dimension scores which included 5 subscales (physical functioning, role playing, emotional functioning, cognitive functioning, and social functioning), the symptoms dimension which included 9 subscales (fatigue, pain, nausea and vomiting, shortness of breath, diarrhea, constipation, insomnia, loss of appetite, and economic problems caused by the disease and received treatments), the general dimension, and the dimensions of perception of suffering (physical, psychological, and existential) were higher than the considered error level ($P \geq 0.05$). Therefore, there was no reason to reject the null hypothesis and it could be said that the data had a normal distribution.

The results of descriptive statistics related to the demographic information indicated that the highest

Table 4. The results of the enter regression analysis conducted to predict the dimensions of perception of suffering.

Criterion variable	Predictor variable	R	R 2	Adjusted R square	B	T	F (df)
Dimensions of perception of suffering	Physical	Self-regulation					
			0.58	0.34	0.33	0.58	** -4.60 (40,1)
	Psychological		-0.46	0.21	0.19	-0.46	**-3.34 (40,1)
	Existential		0.30	0.29	0.06	-0.30	*-1.99 (40,1)

: P<0.001; *: P<0.05**

frequency and percent of the patients with cancer were in the age group of 30 to 50 years (0.69).

Table 1 shows that the means of the functional and general dimensions of quality of life are higher than the mean of the questionnaire, whereas the mean of the symptoms dimension is lower than the mean of the questionnaire. The mean of self-regulation approximates the mean of the questionnaire. In relation to the dimensions of perception of suffering, the results have shown that the mean of the physical dimension is lower than the mean of the questionnaire; however, the means of the psychological and existential dimensions are greater than those of the questionnaire.

As can be seen in table 2, self-regulation and the functional ($r=0.45$) and general ($r=0.62$) dimensions of quality of life had a significant, positive relation. Self-regulation and the symptoms dimension of quality of life ($r= -0.52$) showed a significant, negative correlation at the 0.99 confidence level. Additionally, self-regulation had a significant, diverse relationship to the physical ($r= -0.58$), psychological ($r= -0.46$), and existential ($r= -0.30$) dimensions of perception of suffering at the 95% and 99% confidence levels.

The results of the enter regression analysis conducted to predict the dimensions of quality of life demonstrated that self-regulation predicted 0.18 of variance in the functional, 0.26 in symptoms, and 0.37 of the variance in the general health dimensions of quality of life (Table 3). Therefore, self-regulation had a significant, positive relation to the functional dimension ($P<0.001$, beta=0.45) and the dimension of general health ($P<0.001$, beta= 0.62) and a significant,

negative correlation with the symptoms dimension ($P<0.001$, beta= -0.52). Self-regulation is a predictor of the dimensions of quality of life among breast cancer patients. The standard beta coefficients have indicated that a one-standard deviation increment in the scores of the cancer patients on self-regulation changed the functional dimension scores by 0.45, symptoms by -0.52, and general health dimension by 0.62.

The results of the enter regression analysis conducted to predict dimensions of perception of suffering demonstrated that self-regulation respectively predicted 0.33 of the variance in the physical, 0.19 in psychological, and 0.06 of the variance in the existential dimensions of perception of suffering (Table 4). Therefore, self-regulation had a significant, diverse relationship to the physical ($P<0.001$, beta=0.58), psychological ($P<0.001$, beta= -0.46), and existential ($P<0.001$, beta= -0.30) dimensions. Self-regulation predicted the dimensions of perception of suffering among the patients with breast cancer. The standard beta coefficients indicated that a one-standard deviation increment in the scores of the cancer patients on self-regulation changed the scores on the physical by -0.58, psychological by -0.46, and existential dimensions of perception of suffering by -0.30.

Discussion

The results of this study demonstrated that self-regulation had a significant, positive relationship to the functional and general dimensions of quality of life. In addition, self-regulation had a significant, negative relationship

to the symptoms dimension of quality of life. The results of stepwise regression analysis conducted to predict dimensions of quality of life demonstrated that self-regulation respectively predicted 0.18 of the variance in functional, 0.26 in symptoms, and 0.37 of the variance in the general health dimensions of quality of life. These findings supported the results of previously conducted studies which indicated the relationship between self-regulation and quality of life.^{11-14, 9-21}

Kim et al. and Garlick et al. reported that numerous cancer patients who suffered from mental distresses that included anxiety, depression, and stress had decreased levels of function levels and emotional stability.^{11,12} Results reported by Rahimi et al. and Tang et al. demonstrated that cancer patients experienced high levels of physical suffering, anxiety, and depression along with low levels of quality of life. In addition, they indicated that inappropriate emotional responses were diversely related to quality of life.^{13, 14}

The results of the current study showed that self-regulation had a significant, diverse correlation with the physical, psychological, and existential dimensions of perception of suffering. Stepwise regression analysis demonstrated that self-regulation respectively predicted 0.33 of the variance in the physical, 0.19 in psychological, and 0.06 of the variance in existential dimensions. These findings supported results from previous studies which revealed the relationship between self-regulation and perception of suffering.¹⁵⁻²² Llewellyn et al. and Ruiz-Aranda et al. indicated that emotional self-regulation correlated with perception of suffering.^{16, 17} Additionally, the results of a study conducted by Louro et al. demonstrated that positive affect among the patients with cancer had a significant correlation with high levels of general health, good social functioning, positive changes, low levels of depression, low levels of anxiety, and high levels of mental health.²²

In this regard, it can be inferred that an association exists between emotional self-regulation and desirable outcomes of physical health. It is likely that several biological processes

modify the impacts of emotional self-regulation on physical health. Emotions include positive and negative emotions. Positive emotions expand the scope of cognitions and behaviors, and are associated with health outcomes such as chronic pain. Positive emotions serve as important adaptive and protective factors in times of stress and chronic pain. While positive emotions, to some extent, play a mediating role in the relationship between efficiency to cope and controlling pain-related interferences, this role does not exist with negative emotions. Therefore, if patients with chronic diseases, especially breast cancer, can maintain happiness through applying emotion regulation strategies, they can reduce their mental suffering caused by this disease. Through interventions which enhance their emotional self-regulation, an effective step can be taken towards improving the quality of life among breast cancer patients. On the other hand, improving the quality of life and reducing feelings of pain cause resistance to stressors and assist to enable people to easily deal with psychological problems.

Therefore, interventions, which aim to assist patients with breast cancer to regulate their emotions, also assist with reassessment of their goals and priorities. If psychological treatments can be applied along with the medical treatments, an increasing number of patients can return to normal lives.

We propose that the use of books and educational brochures, along with individual and group counseling sessions associated with emotional regulation, and encouragement of patients to take part in cultural and sports activities can be a major step forward toward improving the level of quality of life among patients with breast cancer.

Limitations of the current study included the small sample size, specific location (Zahedan), lack of cooperation from some patients because of the severity of their disease and their poor physical and mental conditions, decreased literacy and illiteracy of some of the patients (handled through reading the questions to them), and the cross-sectional data collection. Hence, as a result

of these limitations, caution should be exercised when generalizing the results.

Acknowledgements

We would like to thank all participating patients in the study as well as the nurses and colleagues that assisted in data collection.

Conflict of Interest

No conflict of interest is declared.

Funding/support

This study was derived from a Master's thesis in General Psychology and approved by the University of Sistan and Baluchestan, Zahedan, Iran.

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