

# Predictors of the Worry About Cancer Recurrence Among Women With Breast Cancer

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## Research Article

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# Abstract

**Introduction:** Worry about cancer recurrence is identified as the most common psychological burdens experienced by cancer patients and survivors. The present study aimed to determine the predictors of worry about cancer recurrence among women with breast cancer.

**Materials and methods:** This cross-sectional study was conducted on 166 women with breast cancer undergoing chemotherapy and radiotherapy, who referred to private and public oncology centers in Tabriz, Iran using the convenience sampling method. Data collection tools were demographic and disease characteristics questionnaire, cancer worry scale, social support questionnaire, brief illness perception questionnaire, international physical activity questionnaire-short form, and The EORTC-in-patsat32. The data were analyzed using SPSS 25 software. Pearson correlation coefficient, independent t-test, ANOVA, and multivariate linear regression were used.

**Results:** In the present study, the mean (standard deviation) of score of worry about cancer recurrence was 17.41 (7.88) from the range of 8-32. The results revealed that the type of surgery, illness perception, satisfaction with care, and place of treatment were the most important predictors of worry about cancer recurrence, which explained 44.3% of the variance.

**Conclusion:** The enhancement of satisfaction with care and training coping strategies among individuals with high perceived severity of the illness contribute to the reduction of worry about cancer recurrence and adaptation to breast cancer.

## Introduction

Breast cancer is considered as the most common malignant cancer and the leading cause of death among women worldwide (1). Further, breast cancer is very common among Iranian women, which represents 24.6% of all cancers. The average annual crude incidence of primary breast cancer is 22.6 per 100,000 Iranian women (2). The incidence of breast cancer in Iran has increased significantly in the last two decades, due to the change in lifestyle and reproductive behaviors and its trend is expected to increase in the future, because of the correlation with population aging (3, 4).

Improving the cancer diagnosis and treatment methods has led to an increase in the number of cancer survivors for a long time (5). One of the biggest worries of breast cancer survivors is about cancer recurrence, which women with breast cancer experience its varying degree in their survival path (6–12). Worry of cancer recurrence refers to the concern about the return or progress of cancer in the same organ or in another part of the body (9).

Worry about cancer recurrence is recognized as the most common psychological burdens experienced by cancer patients and survivors. Based on the results of previous studies, worry about cancer recurrence is 39%- 97% and its manifestation range varies from fear as a natural response to cancer to behavioral

disorders, depression, and distress (8, 10). High severity of worry about cancer recurrence is significantly associated with lower quality of life, functional disorders, and increased health care costs (10, 13).

In addition, several early studies conducted on cancer survivors, such as breast, gynecologic, colorectal, and head and neck cancers, demonstrated that the high severity of worry about recurrence were more correlated with demographic, medical, and psychological characteristics, such as cancer diagnosed at young age, low elapsed time from the diagnosis of cancer, more advanced disease, low level of satisfaction with care, low social support, low social class and educational level, and high pain, and physical symptoms. However, these findings are sometimes contradictory in different studies (14–17).

More knowledge about predictors of worry about cancer recurrence among survivors may help health care providers in designing interventions and improving patients's quality of life. Therefore, considering the limited number of studies focused on the worry about cancer recurrence among breast cancer survivors and its effect on quality of life (13), the present study aimed to determine the predictors of worry about cancer recurrence among women with breast cancer.

## Methods

### Procedure

This cross-sectional study was conducted on women with breast cancer who referred to public and private oncology centers in Tabriz, Iran for chemotherapy or radiotherapy from October to March 2020. The inclusion criteria were getting primary breast cancer based on the medical record with each stage, more than one month elapsed from the diagnosis, and undergoing chemotherapy or radiotherapy. The exclusion criteria included having a history of chronic and systemic diseases, having a history of mental disorders, having other concurrent cancers or breast cancer metastases based on the medical record, undergoing chemotherapy or radiotherapy due to the cancer recurrence, and experiencing other stressful events, such as death of relatives during the last six months.

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2 \delta^2}{d^2}$$

The sample size was determined using the formula and calculated based on the study of Konings et al. (18). Thus, considering SD = 3.4, d = 0.05 around the mean (14.4),  $\alpha = 0.05$  with 95% confidence coefficient, and 20% sample drop, the sample size was calculated 166 subjects. The sampling was done using the convenience sampling method after obtaining the permission of the Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1398.577). In the same vein, the researcher referred to the public and private oncology centers in Tabriz, evaluated the patients in terms of the inclusion and exclusion criteria, provided the information about the research objectives and confidentiality of information, and asked the eligible patients to participate in the study. The written informed consent was obtained from all participants. Therefore, 166 women with breast cancer undergoing chemotherapy and radiotherapy (83 subjects from public centers and 83 from private centers) completed the demographic and disease characteristics questionnaire, cancer worry scale, social

support questionnaire, brief illness perception questionnaire, international physical activity questionnaire-short form, and the EORTC-in-patsat32 through interview in a quiet environment. Some important questions, such as the type and stage of cancer were completed from the patients' files.

## Measures

The demographic and disease characteristics questionnaire included the variables of age, educational level, occupation, family income level, insurance coverage, place of residence, marital status, number of children, type and stage of breast cancer, place of treatment, and type of surgery as well as elapsed time from the diagnosis of cancer.

The present study used the eight-item cancer worry scale (CWS) designed by Douma et al. (2010). The responses are rated on a 4-point Likert scale ranging from 1: never to 4: almost always. The scores are ranged from 8–32. Higher scores represent more worry about cancer recurrence. The Cronbach's alpha of the tool was 0.88 (19).

The brief illness perception questionnaire (Brief IPQ) with nine items was used to assess the illness perception of women with breast cancer. The first eight items are scored on a scale of 1–10. The item nine is open-ended, questioning the three main causes of the illness. The scores are ranged from 0–80. The Cronbach's alpha coefficient of the tool was reported to be 0.80 and the test–retest reliability was 0.75 (20).

Further, the EORTC-in-patsat32 questionnaire, developed by Bredart et al. (2004), was applied to measure the patient's satisfaction with medical care. The questionnaire evaluates the areas of satisfaction with health care providers, and aspects of the organization of care and services. The responses are rated on a 5-point Likert scale (1: poor; 2: average; 3: good ; 4: very good; 5: excellent) and the score of each area is between 0-100 and higher score represents more satisfaction. The Cronbach's alpha of the tool was calculated to be 0.56–0.96 (21).

The present study applied the twelve-item social support questionnaire developed by zimet et al. (1988). The multidimensional scale of perceived social support (MSPSS) is a 7-point Likert scale ranging from 1: strongly disagree to 7: strongly agree. The total score ranges from 12–84 and the higher the score, the greater the perceived social support (22). The Cronbach's alpha of the tool was reported 0.83 (23).

In addition, the present study used the international physical activity questionnaire - short form (IPAQ-SF) with seven items during the last seven days. The physical activity level is classified into the light physical activity, like walking, moderate physical activity, such as carrying light loads, cycling at average speed, and playing volleyball, and heavy physical activity, such as lifting heavy objects, digging, like digging a garden, aerobic exercise, fast cycling, and running. For Calculating and classifying the physical activity, the metabolic equivalent (MTEs) were calculated for the aforementioned physical activities. The metabolic equivalent is considered to be 3.3 for walking, 4 for moderate activity, and 8 for vigorous

activity. Then, the numbers were multiplied by the duration of performed activity (min) and the number of the days of doing that activity (24):

Metabolic equivalent (min per week) = walking (metabolic equivalent × min × day) + moderate activity (metabolic equivalent × min × day) + vigorous activity (metabolic equivalent × min × day)

The Cronbach's coefficient of .7 was demonstrated for the Persian version of IPAQ-SF (25).

## Statistical analysis

The data were analyzed using SPSS / Ver 25 software and Kolmogorov-Smirnov test was used to measure the data distributions for normality. The data were analyzed using independent t-test, Pearson correlation coefficient, and ANOVA. Then, the independent variables with P- value of less than 0.2 in the bivariate test entered into the multivariate linear regression model through Backward strategy in order to control the confounding variables.

## Results

The mean age of patients was 51.28 (11.85) years and most of them (92.8%) had insurance. Further, 44.5% and 55.4% patients were treated with radiotherapy and chemotherapy, respectively. About half of the subjects (55.4%) underwent lumpectomy. The most common type of illness was carcinoma in situ (62.0%) and in the stage one (46.9%) (Tables 1 and 2).

Table 1

The demographic characteristics of the participants and its relationship with the worry about cancer recurrence (n = 166)

<b>Demographic Characteristics</b>	<b>No. (%)</b>	<b>Worry of Cancer M(SD)</b>	<b>P- Value</b>
<b>Age/mean(SD)</b>	51.28(11.85)	17.41(7.88)	0.145 a
<b>Number of children/mean(SD)</b>	3.12(1.39)	17.41(7.88)	0.629 a
<b>Husband`s age/mean(SD)</b>	57.75(11.14)	17.41(7.88)	0.129 a
<b>Insurance</b>			0.969 b
Yes	154(92.8)	17.40(8.08)	
No	12(7.2)	17.50(4.73)	
<b>Job</b>			0.774 c
Housewife	142(85.5)	17.52(7.98)	
Employee	7(4.2)	19.14(7.88)	
Retired	12(7.2)	15.50(6.80)	
Others	5(3.0)	16.60(8.76)	
<b>Education</b>			0.302 c
Illiterate	68(40.9)	16.01(7.66)	
Elementary	42(25.3)	18.52(8.70)	
High school	37(22.2)	18.29(7.57)	
Academic	19(11.4)	18.26(7.12)	
<b>Husband`s education</b>			0.180 c
Illiterate	44(26.5)	15.92(7.32)	
Elementary/Guidance	56(33.7)	17.57(8.98)	
High school/Diploma	39(23.4)	18.37(6.49)	
Academic	17(10.2)	20.23(7.52)	
<b>Income</b>			0.093 c
Sufficient	21(12.6)	19.47(8.56)	
Relatively sufficient	59(35.5)	18.50(7.53)	
<b>a: Pearson Correlation/ b: Independent t test/ c: ANOVA</b>			

<b>Demographic Characteristics</b>	<b>No. (%)</b>	<b>Worry of Cancer M(SD)</b>	<b>P- Value</b>
Insufficient	86(51.8)	16.16(7.81)	
<b>Marital status</b>			0.393 c
Married	124(74.6)	17.54(7.58)	
Unmarried	20(12)	17.90(8.94)	
Divorced	2(1.2)	8(0.00)	
Widow	20(12)	17.05(8.75)	
<b>Address</b>			0.790 b
Town	124(74.6)	17.31(7.64)	
Village	42(25.3)	17.71(8.62)	
<b>a: Pearson Correlation/ b: Independent t test/ c: ANOVA</b>			

Table 2

The disease characteristics of the participants and its relationship with the worry about cancer recurrence (n = 166)

Characteristics of Disease	No. (%)	worry of Cancer Recurrence Mean(SD)	p-value
<b>Type of breast disease</b>			0.547a
Carcinoma in situ	103(62.0)	17.34(8.01)	
Invasive	63(37.9)	18.50(5.52)	
<b>Stage of cancer</b>			0.053b
stage 1	78(46.9)	15.84(7.63)	
stage 2	70(42.1)	18.84(8.10)	
stage 3	18(10.8)	18.66(7.14)	
<b>How to know about the disease</b>			0.537a
Directly	139(83.7)	17.58(7.75)	
Indirectly	27(16.2)	16.55(8.61)	
<b>Type of surgery</b>			0.078a
Mastectomy	74(44.5)	16.66(7.04)	
Lumpectomy	92(55.4)	19.64(8.06)	
<b>Past time of diagnosis (month)/ mean (SD)</b>	-	17.41(7.88)	0.442c
<b>Past time of surgery (month)/mean (SD)</b>	-	17.41(7.88)	<b>0.048c</b>
<b>Treatment center</b>			<0.001a
Private	74(44.5)	20.12(7.15)	
Public	92(55.42)	15.23(7.80)	
<b>Type of treatment</b>			0.170a
Chemotherapy	92(55.4)	20.02(7.42)	
Radiotherapy	74(44.5)	18.43(8.05)	
<b>a: Independent t test / b: ANOVA / C: Pearson Correlation</b>			

In the present study, the mean (SD) score of worry about cancer recurrence was 17.41 (7.88) from the achievable range of 8–32, divided by chemotherapy group 20.02 (7.42) and radiotherapy group 18.43 (8.05). There was no significant difference between the two groups in worry about cancer recurrence score ( $p = 0.17$ ).

The bivariate tests indicated a significant relationship between the worry about cancer recurrence and the elapsed time from the surgery ( $P = 0.048$ ), place of treatment ( $P < 0.001$ ), and illness perception ( $P < 0.001$ ) (Tables 2 and 3). After entering variables with  $p < 0.2$  in the multivariate linear regression model, the predictors of worry about cancer recurrence included illness perception, satisfaction with care, type of surgery, and place of treatment, which generally explained 44.3% of the variance (Table 4).

Table 3  
The relation of the worry of cancer recurrence with illness perception, social support, care satisfaction, and physical activity

Worry of cancer	Illness perception	Social support	Care satisfaction	Physical activity
<b>r*</b>	0.418	0.009	-0.060	-0.064
<b>P-value#</b>	<b>&lt;0.001</b>	0.912	0.141	0.409
<b>*Pearson correlation coefficient; #Correlation is significant at the .05 level (2-tailed)</b>				

Table 4  
Predictors of worry of cancer recurrence in women with breast cancer (n = 166)

Variable	$\beta$ (CI 95%)*	P#
<b>Illness perception</b>	0.150 (0.077 to 0.222)	<b>0.001</b>
<b>Place of Treatment (reference: Public)</b>		
Private	4.22 (0.516 to 7.929)	<b>0.026</b>
<b>Care satisfaction</b>	-0.051(-0.096 to -0.006)	<b>0.025</b>
<b>Type of surgery (reference: Lumpectomy)</b>		
Mastectomy	3.507(0.416 to 7.431)	<b>0.049</b>
<b>Adjusted R<sup>2</sup></b>	<b>0.443</b>	
*Confidence interval 95%; # Multivariate Linear Regression		

## Discussion

The present study aimed to determine the predictors of worry about cancer recurrence among women with breast cancer undergoing chemotherapy and radiotherapy. In the same vein, the mean (SD) of worry about cancer recurrence score was 17.41 (7.88), ranging from 8–32. In addition, some factors, such as

the type of surgery, place of treatment, satisfaction with care, and perception of the illness were considered as the predictors of the worry about recurrence among women with breast cancer.

The results indicated a significant relationship between worry about cancer recurrence and illness perception. Other studies have also reported the same findings. In a study conducted in New Zealand, on postmenopausal women with breast cancer undergoing chemotherapy, was reported a significant correlation between the worry of cancer recurrence and all domains of illness perception except personal control (26). Shim et al. (2018) in an investigation among women with breast cancer in Korea reported that illness perception is a determinant of worry of cancer recurrence, and noted self-efficacy and depression as the moderators of the relationship between the illness perception and the worry of cancer recurrence (27). In another study on Japanese and Scandinavian women, the illness perception was significantly associated with the worry about cancer recurrence (28). Further, the consistent results were reported in the study of Freeman et al. (29).

In the present study, the type of surgery was significantly associated with worry about cancer recurrence, since patients who underwent mastectomy were more worried about cancer recurrence. Previous two studies also reported the same findings (30, 31). However, Vickberg et al. (2003) and Janz et al. (2011) indicated that women who underwent lumpectomy were more worried about cancer recurrence than those who underwent mastectomy (12, 32). Moreover, no difference was reported in the level of worry about cancer recurrence among patients who underwent mastectomy or lumpectomy in other studies (9, 33), the difference in the results of these studies may be due to the demographic and socio-cultural differences in the illness perception.

In the present study, a significant relationship was observed between the worry about cancer recurrence and satisfaction with care, as higher levels of satisfaction with care were associated with lower worry about cancer recurrence. In a study conducted on the patients with prostate cancer, a significant relationship was observed between worry of cancer recurrence and satisfaction with care. Since higher level of care satisfaction reduce the negative impact of the worry of cancer recurrence on patients' quality of life (34), which is consistent with the present study.

In the present study, the place of treatment was regarded as another predictor of worry about cancer recurrence, as women who referred to private clinics had higher level of worry about cancer recurrence, which could possibly be due to their high level of education. On the other hand, the difference in providing training and support programs in private and public centers can be another reason for the difference in the perceived severity of the disease and consequently, the difference in the worry about cancer recurrence among those who refer to these centers (35).

## **Limitations**

The research design is one of the limitations of this study. Given that this study was cross-sectional, it does not necessarily indicate a causal relationship between the variables.

## Conclusion

The enhancement of satisfaction with care and training coping strategies among individuals with high perceived severity of the illness contribute to the reduction of the worry about cancer recurrence and adaptation to breast cancer.

## Declarations

### Ethical approval and consent to participate

The study was approved by the ethics committee of Tabriz University of Medical Sciences, Iran (IR.TBZMED.REC. 1398.577). Written informed consent was obtained from each participant, if subjects are illiterate from a legal guardian. The principles of anonymity and confidentiality were applied and the participants were provided with the results upon their request.

### Consent for publication

Not applicable

### Availability of data and materials

The datasets analysed during the current study available from the corresponding author on reasonable request.

### Competing interests

The authors declare that they have no conflict of interest.

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### Authors' contributions

M.S.M. and R.N. designed the study. N.N. acquired the data. The E.M. performed the statistical analysis and translated the paper. S.H. prepared the manuscript and prepared tables 1-4. All authors read and approved the final manuscript.

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