Research Report

ANXIETY, DEPRESSION AND QUALITY OF LIFE IN BREAST CANCER PATIENTS UNDERGOING CHEMOTHERAPY IN A TERTIARY CARE CENTRE- A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Breast cancer is the commonest cancer among women worldwide. The diagnosis and treatment of breast cancer are strongly associated with anxiety and depression, which negatively affects the patient's quality of life (QOL). We aimed to study the prevalence of anxiety and depression in breast cancer patients undergoing chemotherapy and their quality of life. **Methods:** This cross-sectional study included 30 women aged 18-65 years diagnosed with breast cancer and undergoing chemotherapy in a tertiary care centre in Kerala, India. Anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS). QOL and its domains were assessed using the WHOQOL-BREF. **Results:** The mean age of women in the study was 53.57±7.33 years. Of the 30 patients, the prevalence of anxiety and depression was 16.7% and 20.0%, respectively. The severity of anxiety was mild, and among patients with depression, 3.3% had moderate depression. In the domains of QOL, the physical domain score was minimal, while the domain of the social relation had a maximum score. The physical domain of QOL was significantly associated with chemotherapy-related hair loss and mouth sores, psychological domain with a family history of psychiatric illness, chemotherapy-related nausea/vomiting and mouth sores. Occupation and total monthly income were associated with the environment domain and postsurgical status with the social relations domain. **Conclusion:** Anxiety and depression were found in breast cancer patients undergoing chemotherapy, and the overall QOL was not affected by anxiety or depression.

Keywords: anxiety, depression, quality of life, breast cancer, chemotherapy

INTRODUCTION

Breast cancer is the most common cancer among women worldwide and is the leading cause of cancer death. It accounts for 14.8% of all cancers in India. The National Cancer Registry Programme Report 2020, released by The Indian Council of Medical Research (ICMR) and National Centre for Disease Informatics & Research (NCDIR), Bengaluru, estimates a 12% increase in cancer cases by 2025 from 13.9 lakh cases in 2020.[1] Reports show that an Indian woman gets diagnosed with breast cancer every four minutes and rates are found to be increasing both in rural and urban areas. Incidence risk starts rising in the early thirties, with a peak at 50-64 years of age.

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The treatment for breast cancer depends on the stage of the disease and prognostic factors, namely the histological characteristics of the primary tumour (degree of differentiation, histological type of neoplasm), the involvement of axillary lymph nodes, hormone receptors expression, over-expression of Human Epidermal growth factor Receptor 2 (HER2) inhibitors, age and general physical condition of the patient.[2] The different treatment modalities for breast cancer include surgery, radiotherapy, chemotherapy, hormone therapy and immunotherapy, which can be used alone or in combination.[3] Each treatment modality has its own merits and demerits, which affects the patient's physical and psychological state.

The impact of breast cancer diagnosis and treatment on psychological wellbeing depend on socio-cultural factors like attitudes, beliefs and social support, and patient-related factors like personality type, coping mechanisms, past psychiatric illness.[4-6] Treatment-related side effects such as lymphoedema, sensory disturbances, persistent pain associated with reduced arm function and the side effects of chemotherapy including nausea, vomiting and alopecia also affect physical and psychological health.[7]

Concerns for family, fears regarding death, disease recurrence, body image changes, disturbances in sexual life, limited social interaction, including interaction with family members and spouse, are factors that can worsen psychological distress.[8-10] This can, in turn, influence disease progression and survival rate. Studies show that breast cancer patients can experience depression and/or anxiety at any stage from pre-diagnosis to the terminal phase of illness, which increase physical and psychological disturbances, thus negatively affecting the quality of life.[11] A study conducted in Iran showed that 32% of breast cancer patients had symptomatic anxiety, and 28.1% had symptomatic depression. Symptomatic anxiety was found in 66.7% and symptomatic depression in 77.8% of patients undergoing chemotherapy.[12]

The World Health Organization (WHO) defines the quality of life (QOL) as "the individual's perception of his or her position in life in the context of culture and value systems in which he or she lives, and in relation to personal goals, expectations, standards and concerns." [13] QOL depends on various factors like cancer related symptoms, duration of illness, patient related factors such as social support and coping, and treatment related factors such as the mode of treatment and related adverse effects.

Early detection of psychiatric morbidity in breast cancer patients will help to provide a better quality of life. Hence this study aims to determine the prevalence of anxiety and depressive symptoms and assess the quality of life in breast cancer patients undergoing chemotherapy.

MATERIALS AND METHODS

Study design

This cross-sectional study was conducted in female breast cancer patients from February 2019 to June 2020 in the Department of Oncology in Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala. Using figures from the study conducted by Lyraraki et al.,[14] required minimum sample size was calculated as 24 using the formula $n= 4pq/d^2$ (p= Prevalence of depression = 62.5%; q= 37.5%; absolute precision d = 20%).. The study included patients aged 18-65 years of age diagnosed with breast cancer within the last 12 months, currently undergoing chemotherapy and who were willing to give informed consent. Patients with a history of psychiatric illness before being diagnosed with breast cancer, patients with severe debilitating illness including coronary artery disease, cerebrovascular accident, chronic liver disease, chronic kidney disease, rheumatoid arthritis, and patients too sick to participate in the interview or complete the questionnaire themselves were excluded from the study. Thirty patients were selected who met the inclusion and exclusion criteria.

Method of data collection

Institutional Research and Ethics committee clearance was obtained before conducting the study. Written informed consent was obtained from each participant, and confidentiality was strictly maintained. Sociodemographic and illness related details were collected using a semi-structured proforma by interview method. Sociodemographic details included age, education, occupation, marital status, type of family, residence and total monthly income, any comorbid medical illness or substance use, family history of psychiatric illness or malignancy. Illness-related details include side and stage of cancer, metastasis, time since diagnosis, any surgical intervention, current

chemotherapy cycle, and associated side effects.

Tools

Hospital Anxiety and Depression Scale (HADS) is an instrument used to screen for anxiety and depression, developed by Zigmond and Snaith in 1983.[15] HADS is a fourteen-item scale having two subscales for anxiety (seven items) and depression (seven items), rated on a four-point (0-3) response category. So, the possible scores range from 0-21 for both anxiety and depression. The score of 0-7 indicates no clinical symptoms of anxiety/depression, 8-10 -mild anxiety/depression, 11-14 -moderate anxiety/depression and 15-21 -severe anxiety/depression. A validated Malayalam version of this scale was used after obtaining permission from "Granada Learning" (GL) Assessment and translation from Mapi Research Trust, which the patients themselves completed.

World Health Organization quality of life-BREF (WHOQOL-BREF) questionnaire was used to assess the quality of life, which contains 26 items and includes a time-frame of two weeks in the assessment. Four domains are measured- Physical domain (seven items), Psychological domain (six items), Social relationship domain (three items) and Environment domain (eight items).[16] Each item is scored on a five-point Likert scale, and 23 items out of 26 are positive while three are negative. A Malayalam validated version of the WHOQOL-BREF was administered to the patients after obtaining permission from WHO permissions Team. The raw domain scores obtained were converted to a 0-100 scale according to the Syntax developed by the group responsible for the WHOQOL.

Statistical analysis

Descriptive analysis was carried out using frequency and percentages for the categorical variables and mean and standard deviation with range for the continuous variables. To evaluate the association between continuous variables, Pearson's correlation coefficient was used and the Chi-square test for categorical variables. Mann-Whitney U test was used to compare the distribution of continuous variables in two independent groups. Statistical analysis was done using SPSS version 20. The p-value of <0.05 is considered statistically significant.

RESULTS

Table 1. Sociodemographic characteristics of women with breast cancer undergoing chemotherapy (n=30)

Sociodemographic variable	Frequency (%)
Marital status	
Married	23(76.7)
Widowed	7 (23.3)
Religion	
Hindu	15(50)
Muslim	1(3.3)
Christian	14(46.7)
Education	
Primary	3(10)
Secondary	20(66.7)
Diploma/graduate	7(23.3)
Occupation	
Housewife	20(66.7)
Non-professional	8(26.7)
Professional	2(6.7)
Type of family	
Nuclear	19(63.3)
Joint	9(30)
Extended Type	2(6.7)
residence	
Rural	13(43.3)
Semi-urban	17(56.7)
Total monthly income (INR)	
10001-25000	4(13.3)
25001-50000	17(56.7)
More than Rs 50000	9(30)
Family history of psychiatric illness	1(3.3)
Family history of malignancy	8(26.7)

In our study, most patients were in the age group 46-65 years (86.7%), and the mean age was 53.57±7.33 years. The majority of the women diagnosed with breast cancer were married, homemakers and were secondary school educated. Among the 30 patients, 19 (63.3%) lived in nuclear families and 17 (56.7%) in semi-urban areas. Eight patients (26.7%) had a family history of malignancy, as shown in Table 1.

Table 2. Clinical characteristics of women with breast cancer undergoing chemotherapy (n=30)

Clinical variables	Frequency (%)
Medical Comorbidities	
Hypertension	9(30)
Diabetes	7(23.3)
Dyslipidemia	12(40)
Thyroid disorder	3(10)
Asthma/COPD	1(3.3)
Side of cancer (Right)	18(60)
Stage of cancer	
Stage I	3(10)
Stage II	20(66.7)
Stage III	5(16.7)
Stage IV	2(6.7)
Metastasis	2(6.7)
Time Since diagnosis	
0-4 months	20(66.7)
5-8 months	7(23.3)
9-12 months	3(10)
Surgery	23(76.7)
Chemotherapy	
1st cycle	1(3.3)
2nd cycle	8(26.7)
3rd cycle	5(16.7)
4th cycle	7(23.3)
Five or more cycles	9(30)
Chemotherapy side effects	
Nausea/vomiting	14(46.7)
Hair loss	25(83.3)
Weakness/fatigue	20()66.7
Mouth sores	11(36.7)

Out of the 30 breast cancer patients, 18 (60%) had right-sided breast cancer, and 20 (66.7%) patients were in stage II of cancer. 20 (66.7%) patients had been diagnosed with breast cancer within the last four months, and 23 females (76.7%) had undergone surgery. Nine patients (30%) were undergoing the 5th or more chemotherapy cycles. In 18 (60%) patients, there were medical comorbidities, wherein dyslipidaemia was found in 40%, followed by hypertension in 30% of the patients. Chemotherapy associated hair loss was the commonest side effect noted, followed by fatigue, as shown in Table 2.

In this study, five patients (16.7%) had mild anxiety. Among the six patients (20%) who had depression, five had mild depression, and one had moderate depression, as shown in Table 3. Anxiety was found to be associated with religious status (p=0.049) and comorbid asthma/ chronic obstructive pulmonary disease (COPD) (p=0.023), whereas increased age (p=0.026) was found to be associated with depression.

Table 3. Prevalence of anxiety and depression in women with breast cancer undergoing chemotherapy (n=30)

Parameter	Frequency (%) (N=30)
HADS A	
No anxiety	25 (83.3)
Mild anxiety	5(16.7)
HAM D	
No depression	24 (80)
Mild depression	5(16.7)
Moderate depression	1(3.3)

QOL across physical health was found to be the most affected and social relations being the least affected, as shown in Table 4. The psychological domain was associated with religion (p=0.022), family history of psychiatric illness (p=0.016), chemotherapy related nausea/vomiting (p=0.048) and mouth sores (p=0.02). Occupational status (p=0.005), total monthly income (p=0.026) and family history of psychiatric illness (p=0.00) were associated with the environment domain. Physical domain was affected with occupational status (p= 0.05), chemotherapy related hair loss (p=0.034) and mouth sores (p=0.02). Postsurgical status was associated with the social relationship domain (p=0.033), as shown in Table 5.

Table 4. Quality of life in women with breast cancer undergoing chemotherapy (n=30)

QoL domains	Mean (SD)
Physical (D1)	60.97(10.604)
Psychological (D2)	61.37(13.1)
Social relationship (D3)	69.8(7.928)
Environment (D4)	63.97(9.786)

DISCUSSION

This cross-sectional study was one among the few studies done in Kerala which assessed the prevalence of anxiety and depression in breast cancer patients undergoing chemotherapy and their quality of life. The study was conducted among 30 women with breast

Table 5.The difference in QOL domains with sociodemographic and clinical variables

Variable	QoL domains (p-value)			
	D1	D2	D3	D4
Age interval (in years)	0.735	0.216	0.905	0.524
Marital status	0.944	0.375	0.167	0.660
Religion	0.073	0.022*	0.402	0.650
Education	0.362	0.680	0.262	0.202
Occupation	0.05*	0.949	0.116	0.005*
Type of family	0.668	0.859	0.860	0.661
Type of residence	0.463	0.810	0.241	0.119
Total monthly income	0.438	0.613	0.131	0.026*
Family h/o psychiatric illness	0.183	0.016*	0.154	0.000*
Family h/o malignancy	0.344	0.388	0.273	0.086
Medical comorbidities	0.621	0.442	0.563	0.301
Side of cancer	0.306	0.649	0.235	0.442
Stage of cancer	0.386	0.953	0.315	0.938
Metastasis	0.132	0.839	0.182	0.767
Time since diagnosis	0.226	0.256	0.251	0.775
Surgery	0.284	0.467	0.033*	0.139
Chemotherapy cycle	0.775	0.930	0.159	0.896
Nausea/vomiting	0.601	0.048*	0.864	0.928
Hair loss	0.034*	0.169	1.000	0.739
Fatigue/weakness	0.383	0.206	0.849	0.571
Mouth sores	0.02*	0.230	0.614	0.457
HADS A	0.098	0.860	0.763	0.355
HADS D	0.614	0.470	0.482	0.128

cancer, and the prevalence of anxiety and depression was found to be 16.7% and 20.0%, respectively, similar to another study conducted in Kerala in cancer patients undergoing chemotherapy which showed 15.38% to have anxiety, while 16.23% to have depression.[6] Studies have shown high levels of psychological distress among breast cancer patients, thus increasing the risk of developing anxiety and depression.[17-19] A study conducted in North India on 200 breast cancer patients showed the prevalence of anxiety and depression as 37.0% and 28.0%, respectively,[20,] which is greater than our study, probably due to the smaller sample size. In a study conducted in Kerala on 270 breast cancer patients, the prevalence of depression was 21.5%,[21] similar to our study.

The results of the study showed that depression was more common than anxiety among the study population. Sociodemographic factors like age, gender, marital status, diagnosis of cancer and the related treatment, including surgery and chemotherapy, stage of cancer, pain and other physical distress, amount of social support, spirituality, religiosity and patient's coping mechanisms and personality traits predict the development of depression.[22,23] A primary concern is physical appearance because breast cancer and its subsequent treatment can change a woman's perspective regarding her body, femininity, sexuality, and self-esteem. Threats of abandonment, pain and death can lead to experiences of insomnia, anorexia, and difficulty concentrating. Fatigue as a side effect of chemotherapy hampers the day-to-day activities, which itself becomes a cause for anxiety and depression.[24]

Most women in our study belonged to the age group 46-65 years, and the majority were married and

homemakers, which is supported by previous studies.[1,25] Low prevalence of anxiety and depression in married women can be explained by the social support received from family, friends and relatives.[23] Lower educational level was found to be a predictor of psychological comorbidity in breast cancer patients in a study,[17]. In contrast, no association was found between educational status and anxiety or depression, which can be explained by the fact that due to the high literacy rates in Kerala, patients have a better awareness of their illness, treatment opportunities, and prognosis. In our study, anxiety was lower in women belonging to the Christian faith (p=0.049), which probably indicates that religious beliefs and spirituality play a significant role in coping with the diagnosis and treatment of breast cancer, which is a stressful event.[23] Also, an association was found between comorbid asthma/COPD with anxiety, which was not seen in other studies.

Most patients experienced hair loss, mouth sores, nausea, and fatigue as a complication of chemotherapy. They were concerned that it affected their bodily appearance, ability to perform daily routine household chores, and decreased social interaction than before. In a previous study, fatigue, nausea and sleep disturbances were found to be associated with depression.[27] But no significant association was found between these factors and anxiety or depression in our study, which could be due to the proper treatment of the associated symptoms, adequate social support and engagement in activities. A higher prevalence of depression in more than 46 years of age in our study group is at par with the previous knowledge that risk of depression is more as age advances,[23] along with a stressful life event, which in this case, is the diagnosis of malignancy and the subsequent treatment.

The time of breast cancer diagnosis and the chemotherapy treatment course are likely to cause adjustment issues, fluctuating course of anxiety and depression, and decreased QOL in patients.[27,28] In this study, all the domains of quality of life, including physical, psychological, social relations and environment domains, scored below 70. But the physical domain scored lowest (60.97±10.604), and the domain of the social relation scored highest (69.8±7.928). In contrast, in a study by Reem Akel et al., physical and emotional wellbeing were most affected in breast cancer patients.[28] This indicates that social support and personal relationships have a significant role in the QOL of breast cancer patients. Also, activities of daily living, fatigue, dependence on medicines, sleep and work capacities included under the physical domain are the facets affected.

Unlike other studies, a family history of psychiatric illness was found to impact the psychological domain of QOL (p=0.016) in our study.[28] Chemotherapy side effects, especially nausea/vomiting (p=0.048) and mouth sores (p=0.02), were also associated with psychological domain, which causes negative feelings and reduces one's self-esteem and concentration, contrary to another study where chemotherapy and side effects were associated with physical wellbeing.[28] Religious beliefs also had an important role in the psychological domain (p=0.016), which may be acting as a protective factor in terms of severity of anxiety and depression. Chemotherapy related hair loss (p=0.034) and mouth sores (p=0.02) influenced the physical health domain in our study, which is in accordance with other studies.[28] Worries about hair loss causing inhibition in facing people and thereby affecting mobility.

Occupational status (p=0.005) and total monthly income (p=0.026) were associated with the environment domain, which may be due to the majority of our patients being housewives and financial constraints associated with the treatment of breast cancer impacting the participation in leisure activities, travel, etc. In a study conducted in Reem Akel et al., income was a significant predictor of social wellbeing.[28] It is interesting to note that no association was found between anxiety and depression with each of the domains of QOL in this study, unlike in other studies,[21] which may be due to the small sample size, higher social support and earlier diagnosis and treatment of cancer which increases the quality of life. Other studies did not explore the association of individual domains of QOL with various sociodemographic and illness related variables, which is a feather in the crown to this study.

In this study, the majority were diagnosed with stage II breast cancer within the last six months and had undergone surgery mainly modified radical mastectomy, which was associated with the domain of the social relation of QOL (p=0.042). This is in accordance with other studies in which the type of surgery performed was negatively related to the physical and emotional functionality and the quality of

life of breast cancer patients.[27] This may indicate that breast cancer patients following modified radical mastectomy have poor social interaction owing to probably body image concerns. They may also distance themselves from their spouse as they feel their femininity is lost and may lose sexual interest.

LIMITATIONS

First, being a small sample size, the prevalence of anxiety and depression and its association with various sociodemographic characteristics could not have been accurate. Second, because of the cross-sectional design of the study, the possibility of anxiety or depression, later on, could not be evaluated. Third, this study was conducted in a tertiary care centre in a semi-urban area, so the sample included only those who could afford the treatment and related expenses. Fourth, our study did not include coping styles and personalities that may affect psychological wellbeing and QOL. Fifth, other comorbid psychiatric conditions associated with cancer, including adjustment disorder, delirium etc., were not assessed.

CONCLUSION

Anxiety and depression are common psychiatric morbidities seen in breast cancer patients undergoing chemotherapy. Individual QOL domains were not associated with anxiety or depression. But, physical and psychological domains of QOL were significantly associated with chemotherapy related side effects, and the domain of the social relation was associated with the surgical treatment. Hence, screening all breast cancer patients for anxiety and depression is important to facilitate early diagnosis and treatment. Further studies can be done in a large sample and as a prospective study to explore the development of symptoms later on, even if absent in the initial phases.

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None declared

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