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Depression and associated factors among adult breast cancer patients attending at selected public hospital in Addis Ababa, Ethiopia

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Abstract

Background: Depression is a major public health problem among adult breast cancer patients. Although there are few studies on depression, data were mainly from a single center and the potential risk factors were not exhaustively addressed. Thus, we aimed to investigate the prevalence of depression and risk factors among adult breast cancer patients at two big hospitals in Addis Ababa.

Objective: To assess depression and its associated factors among breast cancer patients attending public hospitals in Addis Ababa, Ethiopia, in 2021.

Methods: An institution-based cross-sectional study was conducted among adult patients with breast cancer attending at Tikur Anbessa Specialized Hospital and St. Paul's Hospital Millennium Medical College from June to July 2021. Simple random sampling was used to obtain a sample size of 318. Data were collected using the standard Patient Health Questionnaire-9, structured questionnaire interviews, and chart reviews. SPSS version 25 was used for analysis; the correlation between independent and dependent variables was evaluated using a logistic regression model. Each analysis regarded a *p*-value less than 0.05 as statistically significant.

Result: The mean age of the participants was 43.1 ± 11.3 years. The prevalence of depression among adult breast cancer patients was 33 (10.6%), and according to the patient health questionnaires (PHQ)-9 score categorization, 116 (37.3%) were minor, 28 (9%) were moderate, and 5 (1.6%) had moderate severity. The duration of diagnosis was <12 months and stage 2 breast cancer was more protective against depression than stage 4 breast cancer. A lower monthly income and poor social support were significantly associated with depression.

Conclusion: The prevalence of depression was moderate among adult patients with breast cancer; the stage of cancer, duration of diagnosis, income, and poor social support were significantly associated with depression, emphasizing the value of counseling.

Keywords

Breast cancer, depression, risk factor, Addis Ababa, Ethiopia

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Introduction

Breast cancer ranks as the second most common type of cancer globally, affecting more women than any other type of cancer. Statistics from 2019 show that the incidence of breast cancer is 11.6% higher than that of all other cancers and that it causes 6.5% more fatalities globally.[1] One of the most prevalent malignancies in women and one of the most detrimental mental and emotional repercussions is breast cancer (BC), a cancerous growth that begins in breast cells and spreads to other parts of the body.[2,3]

Breast cancer is the most prevalent cancer in the world to be diagnosed in women and the leading cause of cancer-related deaths among them, with an estimated 2.3 million diagnoses and 685,000 fatalities reported in 2020.[4] Breast cancers are predicted to affect 882,900 new cases annually in developing nations. Every year, these malignancies claim the lives of around 324,300 women. Depression and other mental health issues affect between 30% and 40% of cancer patients; however, many of these cases go undetected and untreated.[1,5,6]

Depression is a common mental condition that manifests as low energy, a depressed mood, guilt, feelings of low self-worth, and trouble concentrating.[7] In addition to uncertainty about the implications of cancer or treatment on their quality of life, body image and sexuality problems, cancer recurrence, and the influence on their families, women also experience despair and anxiety.[8–11] Depression is one of the most common. Decreased adherence to anti-cancer treatments and feelings of a psychological burden on the family are common traits associated with depressed cancer patients' psychological consequences of BC.[12,13] Depression lowers immunity and survival chances, which is why treatments that improve general health are crucial for BC treatment. It has been identified in one in five women with BC and has a detrimental impact on women's quality of life.[14,15]

These facts call for consideration and management of the psychological burden of cancer patients, even if complicated BC treatment is being performed, and the diagnosis and treatment of depression is therefore of high importance where psychosocial and pharmacological interventions alone or in combination can be delivered to treat depression.[16]

During follow-up care, survivors' psychological needs are often neglected. Also, the total number of BC patients in Iran is approximately 40,000, and more than 7000 patients are diagnosed each year.[17,18] BC diagnosis is an extremely unpleasant and unbelievable experience for each person, which can disrupt family life. Meanwhile, fear and worries about the death and recurrence of the disease, mental impairment, financial concerns, and family problems lead to the emergence and increase in the severity of psychiatric disorders such as depression. Depression, as a mental disorder, affects the thoughts, physical symptoms, occupational performance, quality of life, body image, and poor psychosocial well-being of patients.[19–22]

There have been reports of several risk factors for depression in breast cancer patients, including pain, neuroticism, stressful life events, being single or divorced, sleep disturbances, and a history of depression in the past.[23] In Ethiopia, depression is by far the most common problem for BC patients. However, there is a lack of sufficient research on depression and related factors among adult breast cancer patients, as well as a knowledge gap regarding the precise prevalence of depression among breast cancer patients in the study area. Significant functional impairment diminishes the likelihood of survival in patients with breast cancer. Therefore, this study aimed to identify the prevalence of depression and associated factors among adult BC patients receiving treatment and care in two public hospitals in Addis Ababa, Ethiopia.

Materials and methods

Study area, design, and population

We conducted a facility-based cross-sectional study among randomly selected 318 adult BC patients on treatment and care in two public hospitals, Black Lion Hospital (TASH) and St. Paul's Hospital Millennium Medical College (SPHMMC), from 15 June to 15 July 2021. BC patients aged 18 years or greater were included in the study, the inability to hear and speak about the presence of severe physical illness, and cognitive impairments that would interfere with a patient's ability to provide informed consent were excluded from the study.

Sampling method and sample size determination

During the sample size calculation using a single population proportion formula, we considered the following assumptions: the 95% CI ($Z\alpha/2 = 1.96$), proportion of depression ($P = 25\%$),[24] and margin of error ($d = 5\%$). Then, by adding 10% of study participants as non-responders, the final sample size was 318. To obtain a representative sample, a simple random sampling procedure was used at the breast cancer clinics at TASH and SPHMMC. Based on the number of patients admitted to the oncology clinic, 270 and 48 samples from TASH and SPHMMC, respectively, yielded a total sample size of 318.

All the BC was scaled for depression by the PHQ-9 tool, based on the standard PHQ-9 cutoff points of 0–4, 5–9, 10–14, 15–19, and ⩾20 and considered as having minimal depression symptoms, minor depression, moderate depression (moderately severe), and major depression (severe), respectively, which is validated in Ethiopia. The total depression score was dichotomized, and patients with a score of ⩾10 were considered to have symptomatic depression.[25]

Sociodemographic and clinical profile sheet. Age, religion, marital status, occupation, educational level, monthly income, cancer stage, chemotherapy, hormonal therapy, radiotherapy, surgery, disease duration, social support, family support, friends, neighbors, pain beliefs, perception, adaptive pain, maladaptive pain, and temporary pain.

Statistical analysis

Data were entered into Epi-data 3.1 and analyzed using SPSS version 25. Descriptive statistics, such as frequencies and means, to identify factors associated with depression among breast cancer patients, odds ratios with their 95% confidence intervals were calculated using binary logistic regression analysis for each independent variable. First, a bivariate analysis was performed to determine the effect of each independent variable on the outcome variable. Variables with a p-value < 0.25 by bivariate analysis were entered into a multivariate logistic regression model to control for the effect of the potential confounding variables, and a variable that was defined as statistically significant at a probability level of 0.05 ($p < 0.05$) was associated with depression and breast cancer during multivariate analysis. Missing data were handled using multiple imputation by chained equations to minimize bias and maintain statistical power. The fitness of the model was checked using the Hosmer–Leme model, which showed goodness of fit.[26] The fitness of the model also examined standardized residuals, leverage values, and Cook's distance to identify any influential observations or outliers that might affect the model's performance. The correlation between the selected variables that met the p-value criteria in the bivariate models was determined using the Pearson test for collinearity. Collinear covariates with a Pearson correlation coefficient greater than 0.5 will be removed from the analysis by keeping only the variables most strongly associated with depression. This process prevents unstable results and helps produce efficient multivariable models. The results are presented in the text and tables.

Data quality assurance. The questionnaire underwent a 5% pre-test to ensure the validity of the data. Based on pre-test feedback, suitable recruitment, and sufficient training and follow-up for data collectors and supervisors, necessary revisions to the questionnaires were conducted. For ease of comprehension, the questionnaire was translated into Amharic. Supervisors and the primary investigator supervised the data collection period. The consistency and completeness of a random sample of records were examined, and helpful comments and changes were made during the data-collection period. Data cleaning was performed before analysis.

Result

Sociodemographic characteristics of participants

Of the total sample, the overall response rate was 311 (97.79%) in this study; 308 (99%) of the respondents were female, and 3 (1%) were male. The mean age of the participants was 43 years (±SD = 11.3). More than three-fourths of participants (267, or 85.6%) were married; more than three-fourths of them (258, or 83%) were living in Addis Ababa; and 53 (17%) were living out of Addis Ababa. Concerning education, more than one-fourth of 121 (38.9%) completed secondary education, and only 25 (8%) of them attended a degree or above. Nearly half, 153 (48%), were housewives (Table 1).

Table 1. Sociodemographic characteristics of participants among adult breast cancer patients at Tikur Anbesa Specialized Hospital and St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia. 2021 ($n = 311$).

Variable	Category	Frequency *N* (%)
Sex	Male	308 (99%)
	Female	3 (1%)
Age	20–35	81 (26%)
	36–45	124 (39.9%)
	>45	106 (34.1%)
Marital status	Single	26 (8.4%)
	Married	267 (85.9%)
	Divorce	11 (3.5%)
	Widow	7 (2.3%)
Residence	Addis Ababa	258 (83%)
	Outside of Addis Ababa	53 (17%)
Education	Cannot read and write	46 (14.8%)
	Primary	81 (26%)
	Secondary	121 (38.9%)
	Diploma	38 (12.2%)
	Degree and above	25 (8%)
Monthly income	<3000 birr	104 (33.4%)
	3000–6000 birr	131 (42.1%)
	>6000 birr	51 (16.4%)
Occupation	NGO employee	44 (14.1%)
	Government employee	56 (18%)
	Housewife	153 (49.2%)
	Others	58 (18.6%)

NGO: non-governmental organization.

Participants' clinical characteristics among adult patients with breast cancer

Of the respondents, 36 (11.6%) were in stage 1, 177 (56.9%) in stage 2, 58 (18.6%) in stage 3, and 40 (12.9%) in stage 4. Regarding the duration of cancer, 103 (31.1%) respondents had less than 12 months, 59 (19%) respondents were between 12 and 24 months, and the majority of respondents, 149 (47.9%), were greater than 24 months.

The nearest two-thirds of respondents, 192 (61.7%), received chemotherapy and surgery. In terms of social support, while 48 (15.4%) respondents were in a status of poor social support, in connection to pain belief perception, 257 (82.8%) had adaptive pain belief perception (Table 2).

Prevalence of depression among adult breast cancer patients

The prevalence of depression is 10.6% (33/311), moderate breast cancer is 9% (28/311), and moderate depression is

Table 2. Clinical characteristics of participants and social support among adult breast cancer patients at Tikur Anbesa Specialized Hospital and St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia 2021 ($n=311$).

Variable	Category	Frequency *N* (%)
Stage of breast cancer	Stage 1	36 (11.6%)
	Stage 2	177 (56.9%)
	Stage 3	58 (18.6%)
	Stage 4	40 (12.9%)
Duration of breast cancer	<12 months	103 (33.1%)
	12–24 months	59 (19%)
	>24 months	149 (47.9%)
Treatment of breast cancer	Chemotherapy	93 (29.9%)
	Surgery	8 (2.6%)
	Chemotherapy and surgery	192 (61.7%)
	Radio therapy and surgery	8 (2.6%)
	None	10 (3.2%)
Social support	Poor social support	48 (15.4%)
	Moderate social support	127 (40.8%)
	Strong social support	136 (43.7)
Pain belief and perception	Adaptive pain	257 (82.6%)
	Maladaptive pain	49 (15.8%)

Table 3. Depression level and prevalence of depression among adult breast cancer patients at Tikur Anbesa Specialized Hospital and St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia. 2021 ($n=311$).

Variable	Category	Frequency (%)
Status of depression	None depression	278 (89.4%)
	Depression	33 (10.6%)
Severity of depression	None (0–4)	162 (52.1%)
	Minor (5–9)	116 (37.3%)
	Moderate (10–14)	28 (9%)
	Moderately severe (15–19)	5 (1.6%)

1.6% (5/311). According to the PHQ-9, there were nine items for the depression sub-scales (Table 3).

Factors associated with depression among adult breast cancer patient

Monthly income, clinical factors, cancer stage, duration of diagnosis, and social support were significantly associated with depression. Monthly income was associated with depression; those with lower monthly income <3000 birr (AOR = 21.3; 95% CI: 2.1–222.6) are more likely to suffer from depression (21.3 times) than those with higher income >6000 birr. Breast cancer patients who are identified by their status as having been diagnosed for less than 12 months (AOR = 4.9; 95% CI: 1.3–18.2) are more likely to develop depression (4.9 times) than those who have been diagnosed for more than 24 months. The duration of diagnosis between 12 and 24 months (AOR = 15.5; 95% CI: 3.9–60.0) is more likely to cause depression, with a 15.5-fold higher rate than those who have been diagnosed for more than 24 months.

Stage of cancer is strongly associated with depression; stage 2 is more protective against depression than stage 4 (AOR = 0.2; 95% CI: 0.04–0.75). Social support was strongly associated with depression. Poor social support (AOR = 9.6; 95% CI: 2.4–39.1) was more likely to cause depression, 9.6 times higher than those who had strong social support (Table 4).

Discussion

The purpose of this research was to evaluate the prevalence of depression and its contributing factors in patients with breast cancer at Tikur Anbesa Hospital and St. Paul Hospital Millennium Medical College. The prevalence of depression among breast cancer patients in this study was 10.6%, which is higher than research from Egypt.[24] Our study was also slightly greater than the study in Taiwan, which was 8.33%.[25] Our finding was lower than the study done in Ethiopia, where the prevalence of depression among breast cancer patients was 25%.[23] Another study from Brazil discovered a prevalence of breast cancer of 49.2%, which is higher than our findings; however, participants in this study were included if they were older than and equal to 18 years old, had undergone treatment, or had not undergone any form of treatment. This was accomplished because only those who underwent or had finished therapy were included in the Brazil research.[9] But our study participants were included from all stages of breast cancer. In the current study, advanced breast cancer, or stage four, was more affected by depression than stage two. The prevalence of 77.3% moderate to severe depression was more prevalent among advanced disease patients.[23] Clinical factors, stage of cancer, duration of diagnosis, low income, and social support were found to be significantly associated with depression. Similarly, a study in the USA found that factors that were significantly associated with depression in patients with breast cancer were associated with lower income and poor financial status, especially in public hospital users.[27] Other studies on China's socio-demographic variables and the variation of depression showed that monthly income was significantly associated with depression, and similar to the current study, poor monthly income was associated with depression.[9,28,29] Another study in Ethiopia showed that income was associated with depression, and higher monthly income was more protective than individuals with higher income, who were less likely to be depressed. Thus, low-income individuals are more likely to be exposed to depression.[30] These findings contradict those of a previous study conducted in Australia.[31] Cancer therapies may be hampered by financial concerns, and patients with breast cancer who are financially stressed may experience depression.[32,33] According to the results of the study, social support was significantly correlated with depression, which suggests that breast cancer patients who

Table 4. Factors associated with depression among adult breast cancer patients at Tikur Anbesa Specialized Hospital and St. Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia. 2021 ($n = 311$).

Variable	Category	COR	95% CI for COR		*p*-Value	AOR	95% CI for AOR		*p*-Value
			Lower	Upper			Lower	Upper	
Monthly income category	<3000 birr	5.57	0.53	58.76	0.15	21.3	2.1	222.6	0.01*
	Between 3000 and 6000 birr	3.73	0.37	37	0.26	9.2	0.9	91.2	0.05
	>6000 birr	1				1			
Social support	Poor social support	7.58	1.64	35	0.01	9.6	2.4	39.1	0.002*
	Moderate social support	1.09	0.23	4.99	0.91	1.5	0.4	4.9	0.53
	Strong social support	1				1			
Duration of diagnosis	<12 month	9.3	2.13	41	0.003	4.9	1.3	18.2	0.019*
	Between 12 and 24 month	16	3.1	82.5	0.001	15.5	3.9	60.0	0.001*
	>24 month	1				1			
Stage of breast cancer	Stage 1	0.48	0.06	4.21	0.50	0.7	0.1	3.4	0.64
	Stage 2	0.06	0.01	0.52	0.01	0.2	0.04	0.75	0.019*
	Stage 3	0.53	0.09	3.08	0.48	1.3	0.3	5.4	0.74
	Stage 4	1				1			

AOR: adjusted odds ratio; COR: crud odds ratio; CI: confidence of interval.
*Significant.

received less social support were more likely to experience depression. This result is consistent with research from Ethiopia and matches the findings of a Taiwanese study on family support.[34,35] Stage 2 breast cancer patients were more protected from depression than stage 4 patients, which is in line with other findings.[30,36,37]

In another study in Ethiopia, clinical factors and the duration of diagnosis were found to be significantly associated with depression.[30] Our findings are also similar to those of a study conducted in the Ethiopian stage of cancer, where a diagnosis duration of less than 6 months and poor social support were found to be significantly associated with depression. In this study, their status as diagnosed at <12 months was strongly associated with depression.[23,34] The finding that marital status did not significantly predict depression is in line with a study conducted in Nigeria,[30] unlike the findings of similar studies, which indicated that married people are less likely to develop depression than single people.[38,39] The study found no significant correlation between depression and the following variables: sex, marital status, education, age, occupation, pain, treatment, and place of residence.

Limitation of the study

The study is cross-sectional, which cannot determine the causation of the association between associated factors and depression among adult breast cancer patients. It may be affected by bias due to using self-report measures. Moreover, only those adult breast cancer patients who visited health facilities were included in the study, and the burden of depression cannot be generalized for all breast cancer patients since we did not include those who stayed at home.

Conclusion

The study found that the prevalence of depression was moderate among adult breast cancer patients at Addis Ababa Public Hospital. Clinical factors (stage of cancer and duration of diagnosis) and social support were significantly associated with depression, but sex, age, religion, monthly income, occupation, residence, education, marital status, treatment, and pain beliefs and perceptions were not significantly associated with depression.

This study emphasizes the value of providing depression counseling to patients to properly address their psychological issues and, as a result, raise the standard of oncology care delivered to patients.

It is advised that all parties involved, including the oncology department, combine psychotherapy with oncology treatment in light of the prevalence of depression. To improve public and professional awareness, early detection, prompt treatment using practical and efficient regimens, and integration of psychotherapy, it is necessary to expand cancer screening programs (human papilloma virus (HPV) testing and PAP (Papanicolaou test) smear), promote health education regarding breast self-examination, and improve public and professional awareness.

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Authors' contribution

ES: Conceived and designed the work; analysis and interpretation of data; revising the article critically and Supervision. EB:

Acquisition of data; drafting of the article and revising it critically. AN: Acquisition of data; revising article. TG: analysis and interpretation of data; drafting of the article. MMS: Supervision; drafting of the article and revising it critically. TS: Conceived and designed the work; analysis and interpretation of data; and revising the article critically. Both authors commented on the initial manuscript and approved the final manuscript.

Declaration of conflicting interests

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

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Ethical consideration

Ethical approval of this study was obtained from the Jimma University institutional review board (IRB) (approval number: THRGD/564/21). The formal letter of cooperation for the study area was shared with the relevant administrative office. Before recruiting any eligible study participants, the purpose of the study and the procedures for gathering data were succinctly explained to each participant. The IRB has also accepted the verbal method of consenting. The permission form was read to the illiterate participants to include them, and each participant then gave verbal, informed consent. Our study complies with the Declaration of Helsinki since participants provided verbal informed consent and sensitive information that may be used to identify the patients was kept confidential.

Informed consent

All participants provided written informed consent or verbal informed consent from illiterate patients for patient information to be published in this article.

Trial registration

Not applicable.

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Supplemental material

Supplemental material for this article is available online.

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