

Research Article

Prevalence of Depression and Associated Factors Among Patients with Cancer at Public Hospitals in Eastern Ethiopia, 2024

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Abstract

Depression is a major public health problem among cancer patients. One in three people with cancer experience depression or anxiety disorders before, during, or after treatment. Currently, there is little data on the prevalence of depression among cancer patients in Ethiopia. Therefore, this study aimed to assess the prevalence and associated factors of depression among patients with cancer attending public hospitals in Harar town, eastern Ethiopia. An institution-based cross-sectional study was conducted among 342 patients with cancer attending public hospitals in Harar town, eastern Ethiopia, from June 1-30, 2024. A systematic random sampling technique was used to recruit participants. Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9). The collected data was entered into Epi-data 4.6 and imported to the statistical package for Social Science version 25 for analysis. Bivariate and multivariate logistic regression analyses were used to identify associated factors with depression. The odds ratio (OR) with a 95% confidence interval (CI) was used to assess the strength of the association. The prevalence of depression among patients with cancer was 43.9% (95% CI: 38.6, 49.2). Poor medication adherence (AOR = 3.98, 95% CI: 1.87, 8.51), poor social support (AOR = 2.14, 95% CI: 1.21, 3.79), unemployment (AOR = 2.31, 95% CI: 1.05, 5.04) were significantly associated with depression. In the current study, a significant number of patients with cancer had depression. Poor medication adherence, poor social support, and unemployment were significantly associated with depression among patients with cancer. Therefore, special attention should be given to patients with cancer with the mentioned risk factors of depression.

Keywords

Prevalence, Associated Factors, Depression, Cancer Patient, Harar, Ethiopia

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1. Introduction

A person diagnosed with cancer is more likely to experience adverse mental health outcomes such as depression and anxiety [1]. The cancer diagnosis causes a wide range of complicated emotions and lifestyle changes. Many people feel to blame for getting cancer and suffer from psychological disorders like major depression and anxiety [2]. Depression and anxiety are the two most prevalent and debilitating neuropsychiatric disorders caused by cancer [3]. Both are psychological and physiological disturbances characterized by physical, emotional, and behavioral elements [4]. Almost half of cancer patients have psychological disorders such as depression and anxiety [5].

Globally, the prevalence of depression among patients with cancer ranges from 6.49% to 95% [6-8]. A prospective, multicenter cohort study in Spain reported that the prevalence of depression was 36.6% [9]. In a study conducted in Nigeria, the prevalence of depression among patients with cancer was 40.3% [10]. In Ethiopia, depression prevalence rates ranged from 25% to 70.86% [8, 11]. Patients with cancer are more likely to experience depressive symptoms than the general population (25% vs. 6%) [12]. A cross-sectional study conducted among patients with cancer at Black Lion Hospital in Ethiopia revealed that the prevalence of depression was 40.4% [13]. The pooled prevalence of depression among cancer patients in Ethiopia was 42.96% [14].

Depression among patients with cancer is related to different factors as per different literature. Factors like age, sex, marital status, education level, income level, poor patient-provider interaction, social support, financial support, sleep quality, being unemployed, comorbid psychotic symptoms, eating problems, type of cancer, and stage of cancer were documented as significant predictors of depression among cancer patients [8, 13, 15-18].

Despite the significant financial and medical consequences associated with depression, little is known about the prevalence of depression among patients with cancer, especially in the eastern part of Ethiopia. Therefore, the purpose of this study was to assess the prevalence and associated factors of depression among patients with cancer at public hospitals in Harar town, eastern Ethiopia, in 2024.

2. Methods and Materials

2.1. Study Setting, Design, and Period

An institution-based cross-sectional study was conducted in the Harari region, located 525 KM from Addis Ababa to Eastern Ethiopia. In the Harari region, there are 2 public hospitals namely Jagulla General Hospital and Hiwot Fana Specialized University hospital. The study was carried out from June 1 to 30, 2024.

2.2. Population

2.2.1. Source Population

All adult patients with cancer attending public hospitals in Harar town, eastern Ethiopia, were the source population for this study.

2.2.2. Study Population

All randomly selected adult patients with cancer attending public hospitals in Harar town, eastern Ethiopia, during the data collection period were the study population for this study.

2.3. Eligibility Criteria

2.3.1. Inclusion Criteria

All adult (≥ 18) patients with cancer who were attending public hospitals in Harar town, eastern Ethiopia, during the data collection period were included in this study.

2.3.2. Exclusion Criteria

Patients with cancer who were critically ill during the study period were excluded from this study.

2.4. Sample Size Determination

The sample size was determined by using a single population proportion formula at 95% CI and 5% marginal error. The proportion of depression is P 33.1%, which was taken from a previously conducted study in Addis Ababa [17]. Then sample size was calculated as:

$$n = \left(\frac{Z_{\alpha}}{2} \right)^2 \frac{P(1-P)}{d^2}$$

$$n = \frac{1.96^2 \times 0.331(1-0.331)}{0.05^2}$$

$$n = \frac{1.96^2 \times 0.331(0.689)}{0.05^2} = 338$$

Considering 10% for the non-response rate; $(338 \times 0.1 = 34)$ and $338 + 34 = 372$ so, our final sample size was 372.

2.5. Sampling Procedure and Technique

A systematic random sampling technique was used to get a total of 372 cancer patients on follow-up in a Public hospital in Harari Regional State. On average, the total number of cancer patients on follow-up in the health institutions selected was 740 per month. The sample size allocation was done according to proportionality to the cancer patients in each health facility. Therefore, as we use the systematic random sampling method, to find the K value, we divide $N=740$ to $n=372$ which becomes ~ 1.9 ($K=2$). The first study participant was selected by a lottery method, and the next study participants were chosen at regular

intervals (every 2) and interviewed by data collectors.

2.6. Study Variables

2.6.1. Dependent Variable

Depression (Yes/No)

2.6.2. Independent Variables

Socio-demographic characteristics: age, sex, marital status, occupational status, educational status, monthly income; substances-related factors: alcohol, khat, cigarette; clinical characteristics: types of cancer, duration of illness, duration between treatment and onset of illness, duration of treatment, and comorbid illness.

2.7. Operational Definitions

Depression: Participants with a patient health questionnaire-9 (PHQ-9) score with a cut-off point ≥ 10 [19, 13].

Strong social support: Participants with an Oslo-3 score of 12-14 [20].

Moderate social support: Participants with an Oslo-3 score of 9-11 [20].

Poor social support: Participants with an Oslo-3 score of 3-8 [20].

Poor medication adherence: Participants with a MARS score of 0-4 [17]

Strong medication adherence: Participants with a MARS score of 5-10 [17]

2.8. Data Collection Methods and Instruments

Pretested, structured, interviewer-administered questionnaires and a data extraction checklist were used to collect the data. The Patient Health Questionnaire (PHQ-9) is a 9-item scale composed of questions that correspond to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) diagnostic criteria for a major depressive episode. PHQ-9 scores ≥ 10 indicate depression [19, 13]. Social support was assessed by Oslo-3. The Oslo-3 consists of only three items that ask for the number of close confidants, the sense of concern from other people, and the relationship with neighbors with a focus on the accessibility of practical help [21]. Treatment adherence was assessed by the Medication Adherence Rating Scale (MARS) [17]. It is a 10-item self-reporting multidimensional instrument describing three dimensions: medication adherence behavior (items 1-4), attitude toward taking medication (items 5-8), and negative side effects and attitudes to psychotropic medication (items 9-10). Additionally, clinical-related variables were assessed by "yes/no" questions that developed from different literature.

2.9. Data Quality Control

Data quality was assured before, during, and after the data collection. Before data collection, a standardized questionnaire was prepared. The questionnaire was pretested outside the study area on about 5% of the sample size. The questionnaire developed in English was translated to the local language (Amharic and Afan Oromo) and then translated back to English to see the consistency. Data collectors and supervisors received one-day instruction on how to use the questionnaire, sampling methodologies, ethical principles, data management, and participant identification. During the data collection process, there was close day-to-day supervision, and the questionnaire was checked to ensure completeness and validity by supervisors and the principal investigator. Double data entry was done by two independent data clerks. Then, the two data sets were validated in the software for consistency and mismatches.

2.10. Data Analysis and Management

The data was checked, entered into Epi-data software version 4.6, and imported to SPSS version 25 for analysis. Socio-demographic characteristics and other factors were analyzed by descriptive statistics. A bivariable logistic regression analysis was run to determine the association between the independent variables and the outcome variable. The P-value and an odd ratio with a 95% CI were computed. Then, the variables with a p-value < 0.2 were taken into a multivariable model to control for all possible confounders. For model fitness, the Hosmer-Lemeshow model of fitness was checked, and the test fit the model. The strength of associations was evaluated using the adjusted odds ratio with a 95% CI, and a P value < 0.05 was considered statistically significant.

3. Results

3.1. Socio-demographic Characteristics of the Participants

A total of 342 patients with cancer were involved in this study, with a response rate of 92%. More than three-fifths (69.3%) of the participants were female and the majority (70.5%) of the respondents were married. The mean ($\pm$ standard deviation) age of the participants was 41.08 (± 10.23) years. More than one-fifth (23.4%) of the participants completed secondary school. (Table 1)

Table 1. Socio-demographic characteristics of study participants among adult patients with cancer at public hospitals in Harar town, eastern Ethiopia, 2023 (n = 342).

Variables	Frequency (%)
Sex	
Male	237 (69.3)
Female	105 (30.5)
Age (in year)	
18-34	94 (27.5)
35-51	188 (55)
≥ 52	60 (17.5)
Religion	
Muslim	174 (50.9)
Orthodox	100 (29.2)
Protestant	68 (19.9)
Marital status	
Single	58 (17)
Married	241 (70.5)
Divorced	23 (6.7)
Windowed	20 (5.8)
Residence	
Urban	181 (52.9)
Rural	161 (47.1)
Educational level	
Un able to read and write	82 (24)
1-8 th grade	117 (34.2)
9-12 th grade	80 (23.4)
College	42 (12.3)
Degree and above	21 (6.1)
Occupation	
Farmer	63 (18.4)
Merchant	33 (9.6)
Government employee	83 (24.3)
Unemployed	90 (26.3)
Other	73 (21.3)
Living status	
With family	318 (93)
Living alone	24 (7)
Monthly income	
Less and equal to 1000	199 (58)

Variables	Frequency (%)
1000-4500	90 (26.3)
>4501	53 (15.5)
Social support	
Strong social support	30 (8.8)
Moderate social support	192 (56.1)
Poor social support	120 (35.1)

Others*student, housewife, retired

3.2. Clinical Characteristics and Medication Adherence Status of the Study Participants

Close to one-fourth (23.4%) of the participants have breast cancer. The majority (86%) of the respondents have comorbidity and more than four-fifths (82.2%) have poor medication adherence. (Table 2)

Table 2. Clinical characteristics and medication adherence status of study participants among adult cancer patients among adult patients with cancer at public hospitals in Harar town, eastern Ethiopia, 2024, (n = 342).

Variables	Frequency (%)
Types of cancer	
Breast	80 (23.4)
Uterus	78 (22.8)
Cervical	55 (16.1)
Lung	48 (14)
Testicular	25 (7.3)
Other	56 (16.4)
Duration of illness (in years)	
1-3 years	309 (90.4)
>4 years	33 (9.6)
Duration of treatment (in years)	
<3	331 (96.8)
>4	11 (3.2)
Gap between onset of illness and treatment duration (in years)	
1-4	332 (97.1)
>5	10 (2.9)
Co-morbidity	
Yes	48 (14)

Variables	Frequency (%)
No	294 (86)
Medication adherence	
Poor	281 (82.2)
Good	61 (17.8)

3.3. Prevalence of Depression among Cancer Patients

The overall prevalence of depression among adult patients with cancer was 43.9% (95% CI: 38.6, 49.2).

3.4. Factors Associated with Depression

To determine the association of independent variables with depression, bivariable and multivariable logistic regression

analyses were carried out. In the bivariate analysis, factors including marital status, educational status, occupation, income level, type of cancer, medication adherence status, and social support were associated with depression at a P-value less than 0.2. These factors were entered into the multivariate logistic regression model to control confounding effects. Factors such as poor medication adherence, poor social support, and being unemployed were significantly associated with depression at a p-value less than 0.05.

The odds of developing depression were 3.98 (AOR = 3.98, 95% CI: 1.87, 8.51) times more likely among patients with poor medication adherence than patients with good medication adherence. The odds of developing depression were 2.31 (AOR = 2.31, 95% CI: 1.05, 5.04) times more likely among patients who were unemployed than employed patients. The odds of developing depression were 2.14 (AOR = 2.14, 95% CI: 1.21, 3.79) more likely among patients who had poor social support than strong social support. (*Table 3*)

Table 3. Factors associated with depression on bivariable and multivariable analysis among adult patients with cancer at public hospitals in Harar town, eastern Ethiopia, 2024, (n = 342).

Variables	Depression		COR (95%CI)	AOR (95%CI)	P-value
	No (n, %)	Yes (n, %)			
Income					
< 1000	106 (53.3)	93 (46.7)	1.06 (0.58, 1.95)	0.79 (0.19, 3.26)	0.75
1000-4500	57 (63.3)	33 (36.7)	0.70 (0.35, 1.39)	0.97 (0.31, 3.00)	0.98
>4500	29 (54.7)	24 (45.3)	1	1	
Marital status					
Single	30 (51.7)	28 (48.3)	0.40 (0.14, 1.19)	0.99 (4.6, 2.13)	0.98
Married	152 (63.1)	89 (36.9)	1	1	0.29
Divorced	4 (17.4)	19 (82.6)	0.25 (0.09, 0.68)	2.16 (0.51, 9.14)	0.44
Windowed	6 (30)	14 (70)	2.04 (0.48, 8.61)	1.67 (0.46, 6.11)	
Occupation					
Farmer	43 (68.3)	20 (31.7)	0.63 (0.31, 1.28)	0.76 (0.32, 0.18)	0.54
Merchant	22 (66.0)	11 (33.3)	0.68 (0.29, 1.60)	0.91 (0.31, 2.74)	0.87
Government employee	48(57.8)	35 (42.2)	1	1	0.04*
Unemployed	37(41.1)	53 (58.8)	0.98 (0.52, 1.87)	2.31 (1.05, 5.04)	0.56
Others	42(57.5)	31 (42.5)	1.94 (1.04, 3.63)	1.45 (0.42, 5.05)	
Educational status					
Unable to read and write	36 (43.9)	46 (56.1)	1.16 (0.44, 3.04)	2.29(0.45, 11.75)	0.32
1-8 th grade	75 (42.4)	42 (57.6)	0.51 (0.2, 1.13)	1.42 (0.29, 6.68)	0.66
9-12 th grade	43 (53.8)	37 (46.2)	0.78 (0.3, 2.05)	1.44 (0.34, 6.22)	0.63
College	28 (66.7)	14 (33.3)	0.46 (0.16, 1.33)	0.45 (0.12, 1.73)	0.25

Variables	Depression		COR (95%CI)	AOR (95%CI)	P-value
	No (n, %)	Yes (n, %)			
Degree and above	10 (47.6)	11(52.4)	1	1	
Type of cancer					
Breast	42 (52.5)	38 (47.5)	1.63 (0.81, 3.28)	1.04(0.44, 2.45)	0.93
Uterus	54 (69.2)	24 (30.8)	0.80 (0.39, 1.66)	0.49(0.20, 1.21)	0.12
Cervical	24 (43.6)	31 (56.4)	2.33 (1.08, 4.98)	1.54(0.62, 3.82)	0.35
Lung	23 (47.9)	25 (52.1)	1.98 (0.89, 4.29)	1.18(0.46, 3.05)	0.74
Testicular	13 (52)	12 (48)	1.66 (0.64, 4.32)	1.18(0.39, 3.56)	0.77
Other	36 (64.3)	20 (35.7)	1	1	
Social support					
Poor	47 (39.1)	73 (60.9)	1.55 (0.695, 3.47)	2.14 (1.21, 3.79)	0.01*
Moderate	130 (67.7)	62 (32.3)	0.477 (0.219, 1.04)	2.65 (1.01, 6.92)	0.05
Strong	15 (50)	15 (50)	1	1	
Medication adherence status					
Poor	177 (63)	104 (37)	0.19 (0.11, 0.36)	3.98 (1.87, 8.51)	0.001*
Good	15 (24.6)	46 (75.4)	1	1	

4. Discussion

This study aimed to assess the prevalence and associated factors of depression among patients with cancer attending public hospitals in Harar town, eastern Ethiopia. In this study, the prevalence of depression among adult patients with cancer was 43.9% (95% CI: 38.6%, 49.2%). This finding was in line with the study conducted in Ethiopia (39.6%) [21] and southeast Iran [22]. However, the finding of this study was lower than studies conducted in southern Ethiopia (58.8%) [15], Gondar (58.4%) [23], Bahir Dar and Gondar, Ethiopia (70.8%) [24], the Amhara region (60.2) [2], China (57.1%) [6], Addis Ababa (54.6%) [13], and India [25]. The finding of this study was higher than the study conducted in Debre Berhan (33.1%) [17], Jordan (23.4%) [26], India (22%) [27], Germany (24%) [28], Addis Ababa (25.0%) [11], Egypt [19], and Taiwan (8.33%) [29]. This discrepancy might be due to variations in the study population in terms of cancer types, screening tools used, severity of depression, and other sociodemographic variations. The differences might also be due to variations in the clinical characteristics of the participants. Another reason might be due to better health service interventions and psychological counseling delivered to patients with cancer in the aforementioned high-income countries.

In this study, patients with poor medication adherence had a higher risk of developing depression compared to patients

who had good medication adherence. This finding is consistent with the study conducted in Mekelle, Ethiopia [30], Germany [31], and Canada [32]. This might be due to poor medication adherence, wastage of medication, reduced functional abilities, and a lower quality of life, which leads to depression [33].

In the current study, patients who had poor social support had a higher risk of developing depression compared to patients who had good social support. This finding is in line with the study conducted in Addis Ababa [34], the Amhara region [2], a systematic study in Ethiopia [14], the United States of America [35], Istanbul, Turkey [36], Austria [37], and Iran [38]. This might be because social support provides physical and psychological benefits to patients who are faced with stressful physical and psychosocial events. Social support is thought to be a factor that lowers psychological distress in stressful situations. Increasing the level of social support may help the patient with cancer to reduce depression symptoms. Social support mitigates the negative impact of cancer diagnosis and treatment through the belonging and care they receive from others [39]. Poor social support tends to increase loneliness and stress and often leads to mental health problems such as depression and anxiety [40].

In this study, unemployed patients with cancer are more likely to be affected by depression when compared with employed patients with cancer. This finding is supported by the study conducted in Addis Ababa [17], northwest Ethiopia [8], and Denmark [41]. This might be due to patients who were

unemployed suffering from extreme physical and psychological stress, including depression. Being unemployed may cause sadness, upset, and feelings of hopelessness in patients with cancer.

Limitations of the study

Since the study was a cross-sectional study design, it didn't allow for a temporal relationship between depression and associated factors among cancer patients.

5. Conclusion

In the current study, a significant number of patients with cancer had depression. Poor medication adherence, poor social support, and unemployment were significantly associated with depression among patients with cancer. Therefore, special attention should be given to patients with cancer with the mentioned risk factors of depression.

Abbreviations

DSM-V	Diagnostic and Statistical Manual of Mental Disorders
HRQOL	Health Related Quality of Life
HFCSUH	Hiwot Fana Comprehensive Specialized University Hospital
ICD-10	International Classification of Disease 10
MDD	Major Depressive Disorder
MARS	Medication Adherence Scale
OSSS-3	Oslo Social Support Scale 3
PHQ-9	Patient Health Questionnaire-9
SPSS	Statistical Package for Social Science
WHO	World Health Organization

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Author Contributions

Jerman Dereje: Conceptualization, Data curation, Formal Analysis, Methodology, Writing – original draft and Writing – review & editing

Samuel Demissie Darcho: Formal Analysis, Methodology, Validation, Visualization, Writing – original draft, and Writing – review & editing

Kidist Mehari Azene: Methodology, Validation, Visualization, Writing – original draft, and Writing – review & editing

Bethelhem Fekadeselassie Lemma: Validation, Visualization, Writing – original draft, and Writing – review & editing

Lemesa Abdisa: Formal Analysis, Methodology, Writing – original draft and Writing – review & editing

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Ethical Consideration and Consent to Participate

The Haramaya University School of Medicine and Health Sciences Research and Ethics Review Committee provided ethical approval and clearance (Ref. No. IHRERC/164/2024). Each participant gave written consent after being informed of the significance of the study and the benefits and risks of the study, which are well mentioned in the information sheet.

Availability of Data and Materials

The article contains the original contributions of the study; for additional information, send an email to Mr. Jerman Dereje.

Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

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