

# Twelve-Month Prevalence of Psychiatric Morbidity in Cancer Patients in a Nigerian Oncology Centre

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## Research article

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## Abstract

Background Cancer is a leading cause of mortality worldwide and is associated with a wide range of psychiatric morbidity.

Methods In this descriptive study, 130 patients with different types of cancer were interviewed. Information on sociodemographic characteristics, medical comorbidity, stage of cancer, duration of treatment was obtained. Psychological distress was assessed using the GHQ-12, and psychosocial distress with the Distress Thermometer (DT). The MINI was used to establish the presence or absence of any psychiatric diagnosis, including any substance use disorder. Information on receipt of formal psychiatric treatment was also obtained. Associated factors and predictors of "Any Mental Disorder" (AMD) were determined. Analysis was carried out using SPSS 20.0

Results Prevalence of psychological distress (GHQ score > 2) was 63.8%, psychosocial distress (DT score > 3) (60.8%), adjustment disorder (20.0%), anxiety y disorder (18.5%), major depression (15.4%), delirium (6.9%), psychosis (2.3%), mania (0.8%), 12-month alcohol use disorder (3.8%), 12-month tobacco use disorder (0.8%), 12-month opioid use disorder (26.9%) and 12 month cannabis use disorder (0.8%). In all, 66.9% had AMD. The most common medical comorbidity was hypertension (36.2%) and diabetes (23.1%). Predictors of AMD were: Predictors of AMD were: duration of cancer treatment above 6 months OR = 2.66, 95% CI (1.17-6.05), DT score > 3 OR = 2.78, 95% CI (1.24-6.21) and the presence of any medical comorbidity OR = 2.29, 95% CI (1.02-5.14).

Conclusion Cancer is associated with significant psychiatric morbidity, necessitating a collaborative Consultation Liaison Psychiatric service in cancer care.

## Background

Cancer is a leading cause of mortality worldwide, with about 70% of cancer-related mortality occurring in low- and middle-income countries[1]. It has been projected that cancer-related mortality will continue to rise to over 11 million by 2030 [1]. Nigeria is no exception to this, as data indicate that a total of 41,000 deaths from cancer in 2018, out of an estimated 166,000 cases recorded in the country [2].

The greatest increase in cancer morbidity and mortality will occur in low- and lower-middle-income countries because of epidemiological shift from communicable diseases to chronic non-communicable diseases, including cancer [3]. The increase in the incidence of cancer is driven by several factors such as population growth, greater detection and reporting, lifestyle risk factors including alcohol and drug use and by infection by oncogenic viruses, such as hepatitis B and C, human papillomavirus or *Helicobacter pylori* [4, 5].

Upon the diagnosis of cancer, a wide range of emotional distress develops along the cancer journey, ranging from mild psychological distress to diagnosable DSM V disorder [6-9]. Distress is particularly common in cancer trajectory and the International Federations of Psycho-Oncology Societies had endorsed distress as the "sixth vital sign" in cancer [10].

In terms of specific DSM V disorders, the prevalence of any 12 month mental disorder had been reported to be 39.4% in Germany [11], of which the prevalence of anxiety disorders was 15.8%, mood disorders 12.5%, somatoform disorders 9.5%, nicotine dependence 7.3%, alcohol abuse or dependence 1.1% and 3.7% for disorders due to general medical conditions. In a meta-analysis, the pooled prevalence of any mental disorder was 32% [12], prevalence of mood disorders ranged from 30% to 40% [13] and depression 8% to 24% [14]. In another meta-analysis in China, the prevalence of depression was 54.9% and anxiety 49.7% [15]. In Japan, descriptive analysis of psychiatric referrals at two Japanese cancer hospitals indicated that 34% had adjustment disorder, 19% had sleep disorders, 18% anxiety, 14% major depression and 17% had delirium.

In Nigeria, South of Sahara, there is a serious dearth in the number of mental health specialists in all cadres, there is also a high unmet needs of individuals with mental disorders [16]. The situation is gloomier among patients with chronic, general medical conditions such as cancer because of poor detection rate of psychiatric morbidity by non-psychiatrist clinicians [17], partly due to ignorance, and also partly due to an overlap between somatic symptoms of common mental disorders [18], and side effects of cancer chemotherapy. Thus, it is important to gain insight into the prevalence of psychiatric morbidity in cancer, with its associated factors. This will form the template for the establishment of an effective consultation liaison psychiatric service in the department of oncology at the University College Hospital, Ibadan. This is expected to improve patients' outcome and quality of life.

It is in this context that the study was planned and the objective was to find the prevalence, correlates and predictors of 12-month "Any Mental Disorder" "in cancer patients at the University College Hospital, Ibadan. We also examined the presence or absence of psychiatric treatment for those with cancer who have "Any Mental Disorder" (AMD). We defined AMD as any DSM IV disorder, including delirium and substance use disorder.

## Methods

*Study Design:* This descriptive cross-sectional study.

*Setting:* This study was conducted at the Department of Radiation Oncology, University College Hospital, Ibadan, Nigeria, a 45-bed facility. The department was established in the year 1987 and has Telecobalt and HDR Co60 Brachytherapy machines with modern treatment planning system. The department is a referral centre for cancer patients that require radiotherapy both within the UCH and outside, and as far as some West African countries. From the registry of the department, about 300 new patients with cancer utilize the centre annually [19], thus our sampling frame was taken as 300.

### Participants

To be eligible for the study, participants were required to be adult patients, 18 years of age and above with the diagnosis of any cancer. They were consecutively recruited between June 2016 and March 2017. Excluded were patients who were too ill to follow up research protocols, those with a known psychiatric illness, and those patients not willing to give consent. Participants were selected by the use of multi-stage simple random sampling. At the first

stage, all the 4 Oncology Departments in the University College Hospital, Ibadan were listed. During the second stage, the Radiation Oncology Department was selected by balloting.

At the Radiation Oncology Department, patients who met the eligibility criteria ( $n = 130$ ) were consecutively recruited for the study (Figure 1). The first subject that was interviewed was selected by simple random sampling and subsequent ones consecutively recruited until the minimum sample was met. An effort was made not to duplicate responses by using their hospital number and later allocating research number on a case by case basis.

#### *Variables*

##### *Dependent Variable/Outcome Variable*

The dependent/outcome variable was "Any Mental Disorder" (AMD) which was defined as any DSM IV disorder, including delirium and substance use disorder.

##### *Independent Variable*

Independent variables were sociodemographic characteristics such as age, sex, employment status, marital status, religion, ethnicity as well as clinical characteristics such as stage of the cancer, duration of treatment, type of treatments received by the patient and presence or medical comorbidity. Other independent variables were presence of psychological distress (GHQ score  $> 2$ ) and presence of psychosocial distress, DT score  $> 3$ .

##### *Confounding Variables*

The potential confounding variable was GHQ score  $> 2$  and this was adjusted for during multivariate analysis.

Predictors were variables that were significantly associated with AMD during multivariate analysis, using variables that were significantly associated with AMD during univariate analysis. These were duration of treatment of the cancer, presence of psychosocial distress (DT  $> 3$ ), and presence of medical comorbidity.

#### **Data Sources**

##### **1. Sociodemographic and Clinical Questionnaire**

The sociodemographic questionnaire yielded information on age, sex, employment of the patient, marital status, religion, ethnicity, stage of the cancer, presence or medical comorbidity, type and number of treatments received by the patient,

##### **2. 12-Item General Health Questionnaire (GHQ 12)**

The GHQ 12 is a screening instrument for psychiatric morbidity. Although it does not yield a diagnosis, positive scores are indicative of psychological distress. Each item is rated either 0 or 1 on the basis of the frequency with which the subject has experienced the symptom in the recent past, yielding a maximum score of 12. A score of 1 or above is suggestive of psychological distress; however, to increase specificity, a cutoff point of 2 was used, and score of 3 regarded as positive screen [20].

##### **3. Distress Thermometer**

The Distress Thermometer (DT) was developed as a simple tool to effectively screen for symptoms of distress. The instrument is a self-reported tool using a 0-to-10 rating scale. Additionally, the patient is prompted to identify sources of distress using a Problem List [21].

The cutoff point on the distress thermometer (DT) is 3, and those who score above 3 are classified as having psychosocial distress, which was adopted in the present study. Usually, patients who score a 4 or higher on the DT s more items from the NCCN Problem List [22]. Studies have shown that the DT is positively correlated with the Hamilton Anxiety and Depression Scale [23, 24] and the 12-Item General Health Questionnaire (GHQ 12) [25, 26].

##### **4. Delirium**

The Confusion Assessment Method (CAM) was used to establish the diagnosis of delirium. The CAM consists of nine questions which correlate with DSM IV criteria for delirium [27]. The questionnaire is administered in about 5 minutes following an initial observation of the patient during a cognitive screening test, the Mini-Mental State Examination (MMSE). The diagnosis of delirium made using a standard algorithm which is part of the CAM instrument. The CAM diagnostic algorithm is based on four cardinal features of delirium: 1) acute onset and fluctuating course, 2) inattention, 3) disorganized thinking, and 4) altered level of consciousness. A diagnosis of delirium, according to the CAM requires the presence of features 1, 2, and either 3 or 4 [28, 29]. The CAM when compared with clinician diagnoses using DSM IV criteria, has a sensitivity of 94–100% and a specificity of 90–95% [30].

##### **5. Mini-International Neuropsychiatric Interview (MINI)**

The Mini-International Neuropsychiatric Interview (M.I.N.I.) is a brief structured interview designed to make a diagnosis according to DSM-IV and ICD-10 criteria [31]. The instrument has been found to have similar psychometric properties in different parts of the world and different modules of the MINI have been used in the past in Nigerian studies [32-36]. The psychotic, major depressive disorder, bipolar, anxiety, and alcohol and substance modules of the MINI were used to determine the presence or absence of AMD. Adjustment disorder was diagnosed according to the DSM IV-TR criteria by the authors [37].

## **6. Cancer Staging**

Cancer staging was performed by one of us (AA) an oncologist and was based on the TNM classification. [38]. According to the classification, Stage 0 is *carcinoma in situ* for most cancers. This implies the cancer is at a very early stage and has not spread. Example is cervical intraepithelial neoplasm (CIN), Stage I cancer (early stage cancer) means the cancer is small and is confined to one area. Stages 2a, 2b and 3 mean the cancer is larger and has infiltrated the surrounding tissues or lymph nodes, while stage 4 means the cancer has metastasized.

## **7. Medical Comorbidity**

Patients were classified as having medical comorbidity by using the *proforma* used to elicit the presence of medical comorbidity in mental disorders [39]. The *proforma* included health conditions such as anemia, hypertension, ischemic heart disease, bronchial asthma, chronic dermatitis, diabetes mellitus, thyroid diseases, chronic pain disorder, chronic headache, peptic ulcer disease, liver disease, osteomyelitis, hemorrhoids, tuberculosis, HIV/AIDS, hepatitis schistosomiasis, draconiasis and malaria. This was supplemented by self-reports of any current health condition with a written medical report by the treating physician.

### **Treatment Receipt**

Treatment receipt was evaluated by asking a yes/no question. "Have you ever received treatment for a mental disorder either in a formal setting such as the hospital or from an informal setting such as the spiritualist in the course of this cancer journey"?

### **Interviewers**

Interviewers were 4 psychiatric resident doctors who had previously received training in clinical research. They had been part of our clinical research time over the course of their training.

### **Bias**

To minimize study bias, a pre-test was conducted before the commencement of the study among 15 patients attending the medical oncology unit of the study centre (not part of current study). This was to ascertain the feasibility, applicability, understandability and the application time of all the instruments of data collection in a busy clinical setting. During this period, it was observed that the research protocols suited the proposed sample and the administration time was about 25 minutes which was regarded as adequate.

Selection bias was removed by employing simple randomly sampling to select the participant. Regression analysis further minimized bias by removing the effects of confounding variables.

### **Sample Size**

Given the population size as 300, at 95% confidence interval, and a 5% margin of error, the minimum sample was calculated using sample size table by Research Advisors as 169 [40]. However, 39 participants were excluded from the study for various reasons, including severe illness, and deaths.

### **Data Analysis**

Data analyses were by descriptive statistics and was carried out on 130 participants. There were no missing data. The GHQ-12 and the DT both have cutoff points. Thus, their association with AMD, the association between sociodemographic characteristics versus AMD, the association between medical comorbidity and AMD as well as the association between cancer stage and AMD were sought using Chi square test. This was because the preliminary Shapiro Wilk test of normality carried out before the final analysis shows that all the independent variables differ significantly from a normal distribution. In order to determine the possible effects of confounding variables, the predictors of AMD were determined using binary logistic regression analysis, using variables that were significantly associated with AMD during univariate analysis. We adjusted for GHQ because of collinearity with DT. All analyses were set at 95% CI and performed using SPSS 20.0.

## **Results**

At the Radiation Oncology Department, we approached 169 subjects for the study, however, 130 met the eligibility criteria, were all interviewed and finally completed the study, a response rate of 76.9%. The subjects excluded from the study were because of severe illness, and death in the course of the survey (Figure 1). There were no missing data.

### **Descriptive Data**

Their mean age was 53.74 (13.99) years. The majority 105 (80.8%) were females. Almost half 61 (46.9%) had post-secondary education, 113 (86.9%) were in employment, 90 (69.2%) were married, 91 (70.0%) were Muslims, and 91 (70.0%) were of Yoruba Ethnicity.

Overall, 49 (37.3%) of all cancers were in stage 1, 37 (28.5%) in stage 2a, 23 (17.7%) in stage 2b, 20 (15.4%) in stage 3, and only 1 (0.8%) in stage 4/distant metastasis. Also, 83 (63.8%) of respondents had any medical comorbidity, 68 (52.3%) were on a single form of therapy, while the duration of the cancer was less than 6 months in 66 (50.8%) of cases (Table 1).

Table 1  
Demography of Patients Living with Cancer

<b>Demography</b>	<b>n</b>	<b>%</b>
Age		
1–30	6	4.6
31–40	14	10.8
41–50	39	30.0
51–60	32	24.6
61–70	20	15.4
71–90	19	14.6
Gender		
Male	25	19.2
Female	105	80.8
Education		
None	18	13.8
Elementary	31	23.8
Secondary	20	15.4
Post-Secondary	61	46.9
Employment		
Employed	113	86.9
Unemployed	17	13.1
Marital Status		
Single	40	30.8
Married	90	69.2
Religion		
Christianity	39	30.0
Islam	91	70.0
Ethnicity		
Yoruba	91	70.0
Igbo	18	13.8
Hausa/Fulani	2	1.5
Others	19	14.6
Stage of Disease		
Stage 1	49	37.7
Stage 2a	37	28.5
Stage 2b	23	17.7
Stage 3	20	15.4
Stage 4/Metastasis	1	0.8
Duration of Treatment*		
1–6 Months	66	50.8
>6 Months	64	48.5
No of Treatment Type		
Single	68	52.3

\*Median = 6

<b>Demography</b>	<b>n</b>	<b>%</b>
Multiple	62	47.7
Any Medical Comorbidity		
Yes	83	63.8
No	47	36.2
*Median = 6		

The most prevalent of all cancers in the sample was breast cancer 52 (40.0%), followed by Cancer of the uterus cervical cancer 34 (26.2%) and by prostatic cancer 10 (7.7%) (Table 2).

Table 2  
Types of Cancer

<b>Diagnosis</b>	<b>n</b>	<b>%</b>
Breast	52	40.0
Cervix & Uterus	34	26.2
Prostrate	10	7.7
Thyroid	9	6.9
Colorectal	9	6.9
ENT	9	6.9
Musculoskeletal System	3	2.3
Haematological	2	1.5
Lungs	2	1.5
Total	130	100.0

In terms of profile of mental health problems, 83 (63.8%) scored high on GHQ ( $> 2$ ), 79 (60.8%) had psychosocial distress (scored  $> 3$  on Distress Thermometer), 26 (20.0%) had adjustment disorder, 24 (18.5%) had anxiety disorder, 20 (15.4%) had major depression, 9 (6.9%) had delirium, 3 (2.3%) had psychosis, 1 (0.8%) had mania, 5 (3.8%) met criteria for 12-month alcohol use disorder, 1 (0.8%) had 12 month tobacco use disorder, 35 (26.9%) had 12 month opioid use disorder and 1 (0.8) 12 month cannabis use disorder.

#### Outcome Data

In all, 87 (66.9%) had "Any Mental Health Problem" (Table 3).

Table 3  
Profile of Mental Health Problems

Mental Health Problems	n	%
Psychological Distress GHQ > 2	83	63.8
Psychosocial Distress > 3 on DT	79	60.8
Adjustment Disorder	26	20.0
Anxiety	24	18.5
Depression	20	15.4
Delirium	9	6.9
Psychosis	3	2.3
Mania	1	0.8
12 Month Alcohol Use Disorder	5	3.8
12 Month Tobacco Use Disorder	1	0.8
12 Month Opioid Use Disorder	35	26.9
12 Month Cannabis Use Disorder	1	0.8
12-Month Any DSM IV Disorder	87	66.9
Note: Multiple Diagnoses Reported		

The results also show that the most common medical comorbidity was hypertension (36.2%) and diabetes (23.1%) (Figure I1). In all, 83 (63.8%) respondents had any medical comorbidity (Not in Any Table).

#### Main Results

There was no significant sociodemographic correlate of AMD. The results also show that a significantly higher proportion of patients who had been on treatment for over 6 months had AMD compared with those who had received treatment for 1 to 6 months (79.6% versus 54.5%)  $\chi^2 = 8.9$ ,  $p = 0.003$ . Furthermore, the results show that a significantly higher proportion of respondents who with a DT scores > 3 had AMD compared with those who had DT scores < 4 (71.2% Versus 51.0%)  $\chi^2 = 9.6$ ,  $p = 0.002$ . Finally, a significantly higher proportion of respondents who had any medical comorbidity also has AMD compared with those without any medical comorbidity (73.5% versus 55.3%)  $\chi^2 = 4.5$ ,  $p = 0.03$  (Table 4).

Table 4  
Sociodemographic and Clinical Correlates of Any Mental Disorder

<b>Demography</b>	<b>Yes</b>		<b>No</b>		<b>X<sup>2</sup></b>	<b>P</b>
Age	n	%	n	%		
1–30	6	100.0	0	0.0	5.3	0.4
31–40	11	78.6	5	21.4		
41–50	23	59.0	10	41.0		
51–60	20	62.5	14	37.5		
>60	27	67.2	14	32.8		
Gender						
Male	20	80.0	5	20.0	2.3	0.1
Female	67	63.8	38	36.2		
Education						
None	14	77.8	4	22.2	2.2	0.5
Elementary	18	58.1	13	41.93		
Secondary	13	65.0	7	35.0		
Post-Secondary	42	68.9	19	31.1		
Employment						
Employed	12	70.6	5	29.4	0.1	0.7
Unemployed	75	66.4	38	33.6		
Marital Status						
Single	23	57.5	17	42.5	2.3	0.1
Married	66	71.1	26	28.9		
Religion						
Christianity	27	69.2	12	30.8	0.1	0.7
Islam	60	65.9	31	34.1		
Ethnicity						
Yoruba	61	67.0	30	33.0	1.9	0.6
Igbo	13	72.2	5	27.8		
Hausa/Fulani	2	100.0	0	0.0		
Others	11	42.1	8	42.1		
Stage of Disease						
Stage 1	25	51.0	24	49.0	9.4	0.05
Stage 2a	29	78.4	8	21.6		
Stage 2b	17	73.9	6	26.1		
Stage 3	15	75.0	5	25.0		
Stage 4/Metastasis	1	100.0	0	0.0		
Duration of Treatment*						
1–6 Months	36	54.5	30	45.5	8.9	0.003
>6 Months	50	79.4	13	20.6		
No of Treatment Type						
Single	44	64.7	24	35.3	0.3	0.5
DT >3						
*Median 6 years						

Demography	Yes	No		$\chi^2$	P
Yes	61	77.2	18	22.8	9.6 0.002
No	26	51.0	25	49.0	
Multiple	43	69.4	19	30.6	
Any Medical Comorbidity					
Yes	61	73.5	22	26.5	4.5 0.03
No	26	55.3	21	44.7	

\*Median 6 years

After adjusting for GHQ because of its collinearity with DT, predictors of AMD were: duration of cancer treatment above 6 months OR = 2.66, 95% CI (1.17–6.05), DT score > 3 OR = 2.78, 95% CI (1.24–6.21) and the presence of any medical comorbidity OR = 2.29, 95% CI (1.02–5.14) (Table 5).

Table 5  
Predictors of Any Mental Disorder (Prediction, 71.9%)

Variables	OR	95%CI	p
		Lower	Upper
Duration of Treatment*			
1–6 Months	1		
>6 Months	2.66	1.17	6.05 0.02**
DT > 3			
No	1		
Yes	2.78	1.24	6.21 0.013**
Any Medical Comorbidity			
No	1		
Yes	2.29	1.02	5.14 0.046**
Out of 4 Oncology Departments			
Medical Oncology			
Surgical Oncology			
Haematological Oncology			
Radiation Oncology			
Fig: 1 Sample Selection Flow Chart			

## Discussion

In this study that aimed at determining the Prevalence, correlates and predictors of mental disorders in cancer patients at the University College Hospital, Ibadan, our results indicate that more than two-thirds of the sample had "Any Mental Disorder" of which less than a fifth had ever received treatment for AMD, with none from a formal setting. The results also show that the predictors of AMD were presence of psychosocial distress (DT score > 3), long duration of cancer treatment and the presence of any medical comorbidity.

To the best of the authors' knowledge, this will be the first comprehensive evaluation of mental health problems and receipt of treatment for such at the University College Hospital, Ibadan. The biggest cancer treatment facility in Nigeria.

In this study, psychological distress was reported in 63.8% and psychosocial distress in 60.8%. This is not unexpected, given that upon receiving the diagnosis of cancer, a wide range of emotional distress develops along the cancer journey, ranging from mild psychological distress to diagnosable DSM V disorder [6–9]. The prevalence of psychological distress (GHQ score > 2) and psychosocial distress (DT score > 3) reported herein are much higher than those reported from previous studies from more developed countries. For example. Among a sample of Korean patients with cancer, the prevalence of high DT score was 28.8% [41], while the prevalence of high GHQ score from another study was 35.1%, with varying rate from 43.4% for lung cancer to 29.6% for gynecological cancers [42]. The high prevalence of psychological and psychosocial distress in our sample could be adduced to several factors, including the lack of adequate cancer support system and crises intervention network that handle psychosocial problems among cancer patients leading to a high unmet needs [43]. The emotional responses may also be due to physical symptoms such as pain, nausea, lymphoedema, and other distressing symptoms of the disease and unwanted side effects of cancer treatment. The stigma due to the diagnosis is also another source of emotional distress to the patients [6].

Adjustment disorder was reported in 20% of all patients. This figure seems low compared to figures reported from other parts of the world (34%)[44]. This wide variation may be due to differences in the time period of the interview. Our results generally corroborate the results from previous studies indicating that

people with cancer are at an alarming risk of psychiatric morbidity notably adjustment disorder, delirium, depression, anxiety, or mixed anxiety and depression [8].

Any anxiety disorder was reported in 18.5% of patients. Studies have reported prevalence of anxiety disorder in cancer to range between 19.0% [45] to 32.2% [46]. We found the prevalence of major depression to be 15.4%. Reported prevalence of major depression in cancer varied from 0–38%. This wide variation was reported to be due to various definitions of depression, different ascertainment tools, differences in methodological approaches as well as differences in population studied [47]. Delirium was reported in 6.9% of patients, This is very close to the 6.5% reported in India [48]. The prevalence of delirium in cancer patients has a wide variation from 5–30% and is substantially higher in the terminal stage of illness, where figures as high as 80% may be reported [49, 50]. The low rate of delirium from our sample may be because the study was carried out in the Radiation Oncology department, where a high proportion of them are not on chemotherapy, but radiotherapy [51].

We found that 2.3% of the patients had psychosis. The association between schizophrenia and cancer had produced inconsistent results. While some studies have reported an increased rate of cancer [52], some showed no increase [53], and some others a reduction in the incidence of cancer [51]. These inconsistent observations could be adduced to failure to control for some confounding factors (such as environmental and familial/genetic factors) and also presence of psychosis may vary based on type of cancer [51].

We also found that 1 (0.8%) of our sample had bipolar I disorder (mania). Although there is limited literature on mania in cancer patients, steroid induced mania in a cancer patient had been previously reported [54].

In the current study, we observed that 3.8% had 12-month alcohol use disorder, 0.8 had 12-month nicotine use disorder, 26.9% had 12-month opioid use disorder and 0.8% has 12-month cannabis use disorder. Reports generally claim that the prevalence of substance use disorder is low in cancer populations. For example, some studies have reported a prevalence of 1.1% for alcohol use disorder in cancer patients in Germany [11]. In another study in the United States, only 3% of inpatient and outpatient patients with cancer in a Cancer Centre had substance use disorder [55]. However, studies have demonstrated that approximately 55% of patients with cancer and 40% of survivors experience chronic cancer-related pain [56], for which about 43% of them and 10% of survivors use opioids to manage chronic cancer pain [57]. This has implications for continued non-medical use of opioids [58].

This finding has implication for the management of addiction in palliative care. The goal of such efforts is not complete abstinence, but exerting enough control over illicit drug and alcohol use to allow palliative care interventions to decrease suffering [59]. The presence of substance use disorder and psychosis in cancer is also a potential contributory factor for excess mortality in people with cancer [60].

We also noted that hypertensive heart disease and diabetes were the most commonly reported medical comorbidity. Indeed, cancer and cardiovascular diseases share certain common risk factors such as smoking, unhealthy diet and obesity, physical inactivity, diabetes mellitus, and alcohol abuse [61]. On the other hand, increased access to the modern chemotherapeutic agents that prolong survival of patients with cancer has implications for the development or worsening of hypertension, particularly in patients treated with angiogenesis inhibitors [62].

Our univariate analysis also shows that presence of psychosocial distress, long duration of cancer and of course its treatment, and the presence of any medical comorbidity were all significantly associated with AMD. These variables also remained as predictors of AMD during multivariate analysis.

Our finding regarding the association between psychosocial distress and AMD finds support from previous studies indicating that the DT used in assessing psychosocial distress has a high sensitivity and specificity in detecting major depression and adjustment disorder in cancer patients [63]. Indeed, it has been reported that the DT has a strong discriminatory power relative to the PHQ-9 in establishing the diagnosis of depression [64]. Given that over a third of the current sample has depression or adjustment disorder, our findings suggest the need for screening for diagnosable DSM IV or DSM V disorder in cancer patients.

The association between long duration of cancer treatment and AMD may be understandable, given that cancer chemotherapy [65], radiotherapy [66], or surgical treatment of carcinomas such as breast cancer [67, 68], are associated with anxiety or depression, of which chemotherapy and radiotherapy are administered over a period of time. So also, is the possibility of developing delirium from prolonged exposure to cancer treatment and possible adverse effects of drug/drug interaction [69].

Also, our observation that the presence of any medical comorbidity was associated with AMD is supported by previous studies [70, 71]. Unfortunately, the presence of medical comorbidity in cancer adds to the disease burden because of the difficulty in navigating different medical specialty treatment on one-part, independent burden posed by the medical condition, and the risk of drug/drug interaction on the other part.

The current study therefore, has implications for the integration of comprehensive consultation liaison psychiatric service into cancer care. The finding that 66.9% of the sample had AMD for which none is receiving any formal mental health care is a justification for this. Unless AMD is routinely screened for, this population of cancer patients may remain undetected, contributing to increased morbidity and mortality in cancer. Our findings call for increased and prompt access to cancer care in Nigeria. The development of the 2-item extremely brief and simple psychosis screening tool [72], and the 2 –item patients' health questionnaire that screens for depression [73] could increase the detection of severe mental disorders at the port of entry in the cancer journey. So also, there is the need for routine toxicological screen notably for opioids, because of its likelihood to be used out of prescription for cancer-related pain.

## Study Strength And Limitations

The major strength of the current study is based on the fact that our sample of patients consists of patients with different types of cancer and also in different stages, nonetheless, the study has a number of potential limitations. First is that our sample was drawn from patients attending the department of radiation

oncology. The study was also limited by small sample size and prone to selection bias because the sample was recruited from one of oncology departments in the study site. However, our results should serve as a template for the establishment of an integrated intervention program for the concerned group and also be generalizable to any oncology unit in Nigeria, moreover patients with all types of cancer were sampled.

## Conclusion

A significant proportion of patients with cancer has diagnosable DSM IV or DSM V disorder for which none of them had sought any formal mental health care for. Thus, there is the need for the screening of any DSM IV or DSM V disorder at the port of entry into the cancer journey.

## Abbreviations

AMD  
Any Mental Disorder  
DT  
Distress Thermometer  
GHQ-12  
12-Item General Health Questionnaire  
HADS  
Hospital Anxiety and Depression Scale  
MINI  
Mini International Neuropsychiatric Interview  
CAM  
Confusion Assessment Method  
C.I.  
Confidence Intervals  
DSM-IV  
Diagnostic Statistical Manual of Mental Disorders, 4th Edition  
DSM-V  
Diagnostic Statistical Manual of Mental Disorders, 5th Edition  
OR  
Odds ratios  
CI  
Confidence Intervals

## Declarations

### Ethical Approval and Consent to Participate

Ethical approval was obtained from the Joint UCH/UI Ethical Review Board and the study was carried in accordance with the Declaration of Helsinki regarding research work involving human beings. Written informed consent was also obtained from either the patient or the principal caregiver and all data were fully anonymized. All participants were 18 years or older, therefore, there was no need to obtain consent from the parent or guardian of any child under 16 years.

### Consent for Publications

Not Applicable

## Availability of data and materials

The data sets used during the current study are available from the corresponding author on reasonable request.

**Competing Interest:** Nil

**Source of Funding:** No Specific Funding

### Authors' contributions

VL was involved in study design, data analysis and manuscript writing, SF was involved in study design and data collection, TL was involved in manuscript writing and final editing, MA was involved in data collection and final manuscript review, while AA was involved in final manuscript review. All authors agree to all the contents of the manuscript.

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## Figures

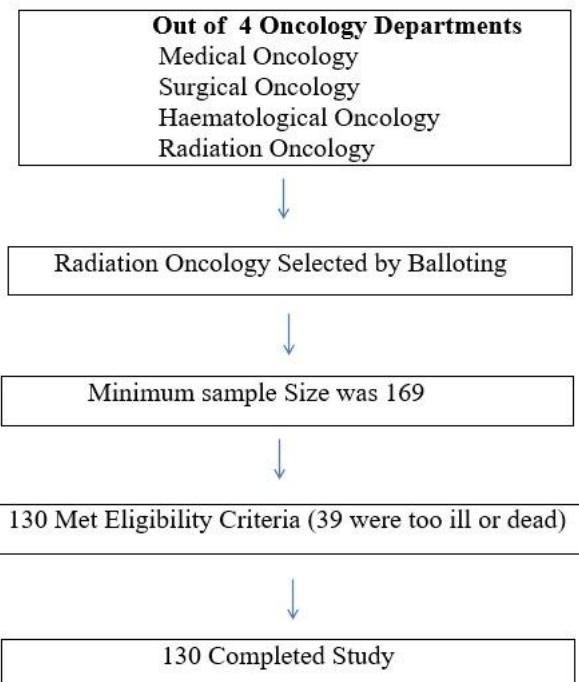
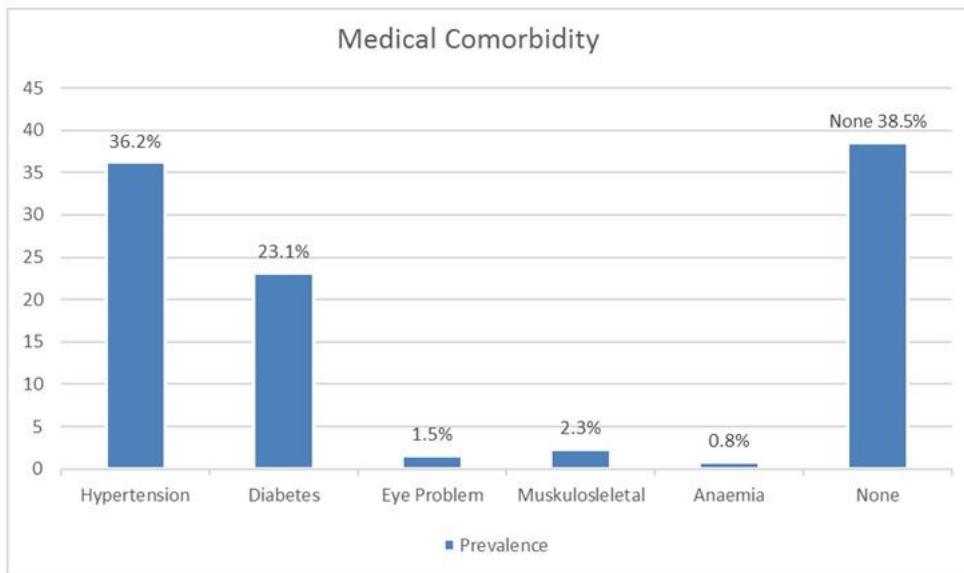


Figure 1

Sample Selection Flow Chart



**Figure 2**

Profile of Medical Comorbidities

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