SUNTEXT REVIEWS

SunText Review of Medical & Clinical Research
ISSN: 2766-4813

Open Access
Research Article
Volume 2:3

Prevalence of Depression among Patients with Breast Cancer Admitted at Moi Teaching and Referral Hospital, Eldoret, Kenya

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Received date: 17 May 2021; **Accepted date:** 22 May 2021; **Published date:** 29 May 2021

Citation: Saina C, Gakinya B, Songole R (2021). Prevalence of Depression among Patients with Breast Cancer Admitted at Moi Teaching and Referral Hospital, Eldoret, Kenya. SunText Rev Med Clin Res 2(3): 133.

DOI: https://doi.org/10.51737/2766-4813.2021.033

Abstract

Background: Depression is the presence of sadness, empty or irritable mood, accompanied by somatic and cognitive changes. The prevalence of depression has particularly goneun recognized among patients with breast cancer and remains untreated hence potentially resulting in complications of physical symptoms, increased functional impairment, and poor treatment outcome. Additionally, the lack of adequate data on depression among patients with breast cancer makes it hard to ascertain how this mental health problem affects the efficacy of cancer treatments. This study therefore seeks to contribute to the data on prevalence of depression among patients with breast cancer at MTRH hence leading to better mental health management of patients with breast cancer which will ultimately contribute to their recovery outcomes.

Objective: To determine the prevalence of depression among patients with breast cancer at admitted at MTRH.

Methods: This study adopted a cross-sectional study design in which the target population were the patients with breast cancer situated at the breast cancer clinic, medical and surgical wards of MTRH in Eldoret. Using census sampling, the study arrived at 102 respondents but ended up using 79.The tools of data collection included the Hamilton Depression Rating Scale. (HAM-D) which was used to diagnose and measure the severity of depression. A questionnaire was also used to obtain socio-demographic and clinical information.

Results: A total of seventy-nine patients were interviewed, 98% of them were females. The mean age was 40±7.8 years. The prevalence of depression among patients with breast cancer was 59.5%. Patients with late-stage breast cancer had 61% increased odds of having depression (AOR=1.61, 95% CI: 0.63, 4.17; p=0.319) than patients with early-stage breast cancer.

Conclusion: There was a high prevalence of depression among patients with breast cancer (59.4%). Being employed, the use of chemotherapy, and the late stage of cancer were significantly associated with having depression.

Recommendation: Screening and interventions for depression should be initiated for all patients with breast cancer especially for those at a late stage of cancer, those on chemotherapy and those who lack employment.

Keywords: Breast cancer; Depression; Associated factors; Chemotherapy; Employment; Cancer stage; Prevalence

Introduction

The severity of cancer among the human population has been increasing globally. The number of cancer cases is expected to more than double worldwide over the next 20-40 years [1]. In the year 2009, it was the third leading cause of death globally. Breast cancer together with lung, colon/rectum, and prostate cancers are some of the most common types of cancers worldwide. Breast cancer is specifically reported to be a leading cancer diagnosis

among women worldwide with more than 210,000 new cases and 40,000 deaths per year in the U.S.A. According to various studies carried out, it has been noted that the prevalence of depression among cancer patients ranges from 10%-58% [2,3]. Major depression was found to be as high as 38%. Cancer is also an emerging problem in Africa. In Kenya, canceris the third leading cause of mortality representing approximately 7% of the national mortality rate. The Eldoret cancer registry also noted that the cancer of the cervix, followed by breast cancer and cancer of the esophagus as the most prevalent types of cancers among women in Kenya respectively [4]. Study of Kenyatta National Hospital revealed that the top three cancers in that hospital were cervical cancer (62.12%), breast cancer (11.8%) and colorectal cancer (6.2%). Kassaman, Wangari and Lusambili study of Moi Teaching and Referral Hospital (MTRH) found that the three most prevalent cancers in that hospital were Karposis sarcoma (18.6%), breast cancer (15.4%) and cervical cancer (8.2%). The diagnosis of breast cancer, and subsequent management of the disease in most of the cases, can be an upsetting and harrowing experience that profoundly affects how the patient feels and increases the chances depression. Some of the risk factors associated with cancer include: climate change, personal diet, genetics and harmful chemicals emitted by industries and other carcinogenic substances [5]. A raft of measures touching on life style changes has been proposed to tackle cancer. These include: reduce tobacco use, increase physical activity, control weight, improve diet, utilizing safer sex practices, avoid excess sun exposure and routine cancer screening. Breast cancer has therefore been recognized as a serious threat to the livelihood of affected persons and those that relate with the patients. Cancer imposes a heavy financial toll on affected patients and the people close to them. Additionally, it also has serious effects on the mental wellbeing of patients due to the harrowing experience that patients go through. Although the physical aspects of the impact of cancer to patients is recognized and a lot of effort goes to alleviating this hardship, the mental challenges that often accompany being diagnosed with breast cancer are often overlooked. Cancer can have adverse effects on the mental status of the individuals leading to depression and anxiety notes that the physical and mental health of cancer patients needs to be addressed throughout treatment and the continuum of the survivorship care [6].

Breast Cancer and mental health

Depression is a mental illness which is defined as a range of moods -from low spirits to severe problems that interferes with everyday life. Bhowmik, Anjan, Choudhury, and notes that depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration [7]. Depression might manifest a number of symptoms that include but not limited to insomnia, loss of concentration, irritability and feelings of sadness or unhappiness. There is increased risk of depression among women with breast cancer. This calls for preventive and therapeutic measures in order to improve the mental health and quality of life of patients during treatment and the post recovery period. In most sub–Saharan African countries, breast cancer remains the leading cause of cancer related deaths among women. Revealed that 23% of all female cases of cancer in Kenya are breast cancer. Breast cancer diagnosis and its treatment are recognized to be stressful times which underscores the need for clinicians to actually identify its psychological sequel such as depression in vulnerable patients. The early detection and treatment of depression in cancer patients is not only significant in improving their quality of life but also in increasing their survival rates. Most of the effort in tackling breast cancer in Kenya has been channeled towards screening and physical treatment with little focus on the mental status of the patients of breast cancer. Cancer treatment does require facilities and equipment in order to effectively reduce mortality rates, however, treatment should also respond to the mental needs of patients since depression can significantly affect the short- and long-term outcome of treatment. In spite of breast cancer being one of the leading causes of mortality among cancer related diseases, little effort is placed on the care of the mental health of breast cancer patients as seen by the lack of mention of mental health by cancer related studies. Few studies have delved into and appreciate the need for mental healthcare among this group and the factors that may aggravate the possibility of having depression notes that a breast cancer diagnosis can have wide ranging impact on the individual, family and the entire society. Breast cancer patients are specifically susceptible to depression and anxiety. Depression affects the cancer patient's treatment and recovery outcomes as well as quality of life and their survival. Furthermore, people with a previous history of using psychiatric services are very vulnerable and are at a very high risk of mortality following the diagnosis of cancer. Unfortunately, the mental health of individuals not withstanding whether they are diagnosed with breast cancer or any other ailment is often ignored. A number of individual factors that are likely to affect the development of depression among breast cancer patients. This includes: age, gender, ethnicity, sexuality, disability, religion, biological factors, co-morbid conditions, marital and cohabitation status. Other characteristics that may not be directly arising from the individual but influenced by external factors include social and contextual factors, prior psychological factors, and psychological response to diagnosis and cancer treatment. This reveals that breast cancer treatment is complicated with a plethora

of issues that may aggravate the outcome of treatment. Although depression is likely to be frequent in patients with breast cancer in Sub Saharan-Africa and especially in Kenya, it is not an adequately recognized and treated condition among breast cancer patients. The impact of inadequate attention on depression in this group of cancer patients causes amplification of physical symptoms, increased functional impairment and poor treatment adherence. This results in unnecessary lose if lives. In this backdrop, this study used the Hamilton Depression Rating Scale (HAM-D) to determine the prevalence of depression among patients with breast cancer. This will go a long way in ensuring common mental health problems that affect breast cancer patients at MTRH are not ignored hence improving recovery outcomes of patients.

Objective of the Study

To determine the prevalence of depression among patients with breast cancer admitted at MTRH.

Materials and Methods

This section presents the methods and materials used in conducting this study.

Study design

Kothari (2004) defines the research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. This study adopted a descriptive cross-sectional study design focusing on the patients with breast cancer at MTRH. All patients with a confirmed diagnosis of breast cancer and who met the inclusion criteria were recruited for the study.

Overview of study area

Recruitment of the study subjects was carried out at the breast cancer out-patient clinic at Chandaria cancer and chronic disease management center and in-patient's unit (surgical, medical wards) at MTRH in Eldoret, Uasin Gishu County, Kenya. MTRH is the second largest national referral hospital and covers the western Kenya region with a population of about 16 million. It is a teaching and referral hospital used by Moi University. The hospital serves patients from western Kenya, north rift, and south rift regions, Eastern Uganda and Southern Sudan. MTRH was chosen for the study because it is a national teaching and referral hospital that has an oncology clinic that covers the western Kenya region and therefore serves a significant size of the population in cancer diagnosis and treatment. In addition, MTRH is a busy referral center and likely to have sufficient patient numbers for the study.

Cancer treatment at MTRH

All types of cancer patients both pediatrics and adult (gynecological, surgical, and medical) patients are attended to at the center. The oncology clinic is run on Mondays and Wednesdays between 8.00 am to 2.00 pm, but remains open for patients who come on any other day of the week.

Census sampling

Census sampling is defined as a statistical method of research where all members of the population are studied [8]. A census is an attempt to list all elements of in a group and to measure one or more elements in that group. Some of the benefits that necessitate a use of this type of sampling technique is the need for enough number of participants in order to have a high degree of confidence in the survey results. The study populations were breast cancer patients above 18 years seen at the out-patient clinic at MTRH, those admitted to the medical ward with confirmed cancer of the breast and the patients in the surgical ward admitted for surgical procedures. The number of patients with a histological diagnosis of breast cancer was 102 from January2016-December 2016. This study therefore sought to all co-opt all 106 breast cancer patients but ended up using 79 patients for the study.

Inclusion criteria

- Adults (aged 18 or older) who have been confirmed to have breast cancer;
- Patients in the medical/surgical wards who have been confirmed to have breast cancer;
- Patients at Chandaria cancer and chronic disease management center outpatient clinic who have been confirmed to have breast cancer.

Exclusion criteria

- Patients in a coma;
- Patients with emotional instability.

Data collection

The following section identifies the tools used in collecting data and the procedures adhered to in dealing with patients during data collection. This study utilized the HAM-D scale and questionnaire to collect data.

HAM-D scale

A 17-item Hamilton Depression Rating Scale (HAM-D) was used to assess depression severity among patients. The total score is obtained by summing the score of each item, 0–4 (symptom is absent, mild, moderate, or severe) or 0–2 (absent, slight or trivial,

clearly present). For the 17-item version, scores can range from 0 to 54. Since its development in 1960 by Dr. Max Hamilton of the University of Leeds, England, the scale has been widely used in clinical practice and became a standard in research trials. The Hamilton Depression Rating Scale has proven useful for determining the level of depression before, during, and after treatment [9]. The Ham-D scale has demonstrated reliability, validity, and efficiency in adults [10].

The scale has been translated into several languages including French, German, Italian, Thai, and Turkish. In comparison to the Beck Depression Inventory, a meta-analysis suggested that after treatments, the HAM-D was more 'sensitive to change' on retesting, and this is probably why it has been so widely used in clinical trials.

Questionnaire

A questionnaire containing the patients' unique number of identifications was also used. The questionnaire was designed for adults and used to rate the severity of their depression by probing: mood, feelings of guilt, suicide ideation, insomnia, agitation or retardation, anxiety, weight loss, and somatic symptoms. The study also followed a number of clinical procedures when collecting data from the patients which are highlighted below.

Clinical procedures

Patients admitted were recruited for the study within 72 hours. In addition, the principal investigator recruited 2 research assistants who were trained by the researcher on how to carry out the study. Their main responsibility was to assist with the identification of the new patients, retrieving their files, and getting all the required information from the participants.

Data processing and analysis

Data processing is defined as the steps involving in editing, coding, classification and tabulation of collected data [11]. The sole purpose of processing is to prepare the data for analysis. The study data collection forms were checked at the end of each day for completeness and appropriate filling and then the data was coded before it was entered into SPSS. In order to ensure data safety and protection, a personal computer was used during the study to store the collected data. The personal computer was password protected. During analysis, descriptive statistics was used especially for continuous data. Means, median and mode was also used for categorical data which was displayed as frequencies and percentages. Data was analyzed using STATA version 14. Furthermore, inferential statistics such as Chi-square and Fisher's exact tests were used to measure associations of categorical variables.

Ethical consideration

The study adhered to the Nuremburg code of research ethics which governs how research participants are co-opted in a study by seeking informed consent from the participants. In addition, the appropriate research standards including proper citations to avoid plagiarism was strictly adhered to. Patients were informed on all the procedures of the study and informed consent was sought from the 79 respondents before enrolment. Confidentiality of the patient's mental status with regard to depression was kept. Additionally, the patients who were found to have depression were sent for review by a psychiatrist and further follow up only after their consent was sought.

Approval to carry out the study in MTRH was sought from:

- The institutional research and ethics committee to carry out the study;
- The chief executive officer MTRH.

Conceptual framework

This study was guided by the conceptual framework illustrated in figure 1 that shows that variables associated with breast cancer patients i.e., age, sex, marital status, education levels, employment status and chemotherapy were found to have an impact on the onset of symptoms that are associated with depression (Figure 1).

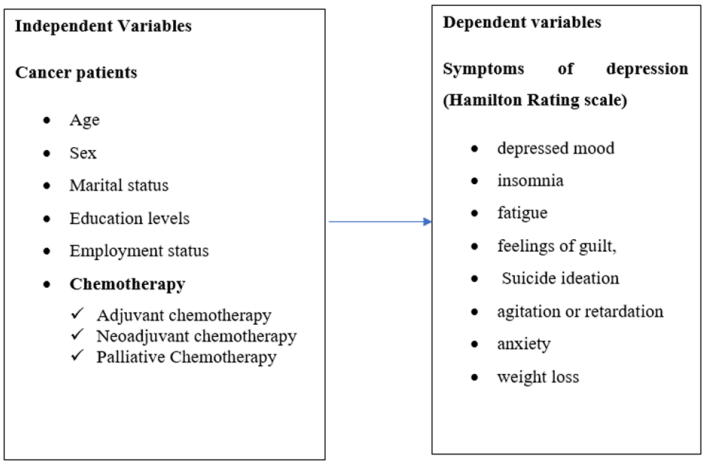

Figure 1: *Conceptual Framework.*

Results

This section presents the significant findings of this study.

Sociodemographic Characteristics

A total of 79 respondents participated in the study. The mean age was 40 (SD=7.8) years suggesting that most cancer patients were above 40 years of age. Of those who responded (98.7%) were females and the majority were married 86.1%. More than half of

the respondents had achieved a tertiary level of education at 58.2%. 79.7% had some form of employment while a paltry 20.3% were unemployed. 43% of the respondents had suffered from some form of substance abuse while 57% had never suffered from substance abuse problems. Of the respondents who had suffered from some form of substance abuse, 17.7% abused alcohol while 16.6% abused other forms of drugs as illustrated in (Table 1).

Table 1: *Socio Demographic Characteristics.*

Variables	Levels	N(%) Mean + SD
Age years		40+7.8
Sex	Female	78(98.7)
	Male	1(1.3)
Marital status	Married	68(86.1)
	Never married	11(13.9)
Education levels	Primary	4(5.1)
	Secondary	29(36.7)
	Tertiary	46(58.2)
Employment	Employed	63(79.7)
	Unemployed	16(20.3)
Substance use	Alcohol	14(17.7)
	Opiate	4(5.1)
	Khat	1(1.3)
	Others	16(20.3)

Table 2: *Factors associated with depression.*

Variables	Total N=79	Depre =yes N=32	Depre =NO N=47	P-VALUE
Age	40 ± 7.8	39.5 ± 6.8	40.4 ± 8.5	0.599
Cancer_stg_2	11(13.9)	0(0)	11(23.4)	0.002
Cancer_stg_3	27(34.2)	13(40.6)	14(29.8)	0.319
Cancer_stg_4	41(51.9)	19(59.4)	22(46.8)	0.272
Surgical treatment	35(44.3)	12(37.5)	23(48.9)	0.315
Hormonal therapy	58(78.4)	21(65.6)	37(78.7)	0.196
Gender female	78(98.7)	32(100)	46(97.9)	0.406
Marital status Married	68(86.1)	29(90.6)	39(83)	0.335
Employment Employed	63(79.7)	29(90.6)	34(72.3)	0.047
Substance use	16(20.3)	4(12.5)	12(25.5)	0.167
Alcohol	14(17.7)	4(12.5)	10(21.3)	0.38
Opiate	4(5.1)	0(0)	4(8.5)	0.143
Tobacco	6(7.6)	2(6.2)	4(8.5)	1
Khat	1(1.3)	0(0)	1(2.1)	1
Educational levels				
Primary	4(5.1)	2(6.2)	2(4.3)	0.42
Secondary	29(36.7)	9(28.1)	20(42.6)	
Tertiary	46(58.2)	21(65.6)	25(53.2)	
Chemotherapy				
Adjuvant chemotherapy	12(15.2)	1(3.1)	11(23.4)	0.048

Neoadjuvant chemotherapy	26(32.9)	12(37.5)	14(29.8)	
Palliative Chemotherapy	41(51.9)	19(59.4)	22(46.8)	

Prevalence of depression

The prevalence of depression among breast cancer patients at MTRH as illustrated in figure one revealed that more than half (59.4%) of the breast cancer patients had depression. Most of the patients with depression had mild depression (35%). Only 6% had severe depression while 18% had moderate depression (Figure 2).

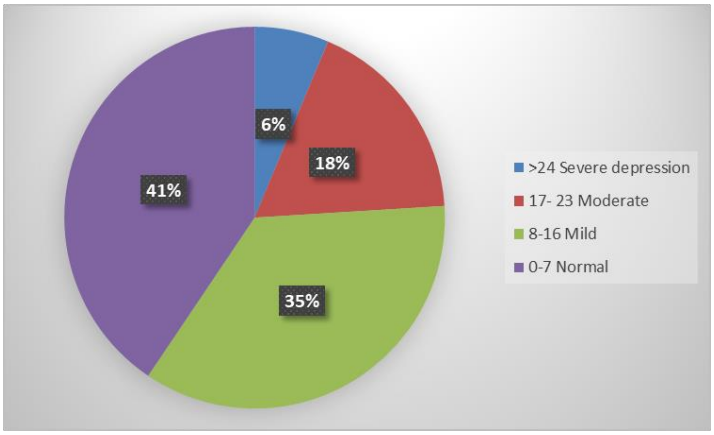

Figure 2: *Prevalence of Depression among breast cancer patients.*

Factors associated with depression

Some of the factors that may be associated with depression and that were the primary focus of this study are age, marital status, chemotherapy, surgical treatments, hormonal therapy, cancer stages, employment, and level of education. The results illustrated in table three revealed that the late stage of cancer, employment, and use of chemotherapy was statistically significant (0.002, 0.047, and 0.048) respectively. Hence suggesting that depression is related to stage two of the cancer, unemployment and use of chemotherapy (Table 2).

Findings of the unadjusted odds ratio

On further analysis of the relationship between depression among breast cancer patients and their employment status, stage of cancer and mode of treatment, the study found out that the odds of being diagnosed with depression among patients with breast cancer among those who were employed had increased odd of 270%, compared to the unemployed, OR: 3.7(95% CI: 1.07, 17.27). The findings between the relationship between depression and mode of treatment revealed that compared to adjuvant chemotherapy, the participants on neoadjuvant chemotherapy and palliative chemotherapy had 830% and 850% increased odds of having a diagnosis of depression among patients with breast cancer (OR: 9.43(95% CI: 1.5, 185.32) and 9.5(95% CI: 1.62, 181.81) respectively. This finding was statistically significant. The study also discovered that compared to the early stage of cancer, the participants with late stage of cancer had 61% increased odds of having a diagnosis of depression among patients with breast cancer, OR: 1.61(95% CI: 0.63, 4.17) (Table 3).

Table 3: *Results of the unadjusted and adjusted analysis of depression among patients with breast cancer.*

Variable	Unadjusted ORs (95% CIs)	P-Value
Age	0.98(0.93,1.04)	0.609
Marital Status: Married	1.98(0.52,9.65)	0.342
Employment Status: Employed	3.7(1.07,17.27)	0.058
Substance Use	0.4(0.1,1.31)	0.152
Alcohol	0.53(0.13,1.76)	0.321
Tobacco	0.72(0.09,3.92)	0.711
Cancer Stage 3	1.61(0.63,4.17)	0.32
Cancer Stage 4	1.66(0.67,4.19)	0.274
Surg_Tx	0.63(0.25,1.55)	0.316
Hormonal Therapy	0.52(0.18,1.42)	0.199
Chemotherapy		
Adjuvant Chemotherapy	Ref	
Neoadjuvant Chemotherapy	9.43(1.5,185.32)	0.044
Palliative Chemotherapy	9.5(1.62,181.81)	0.039
Education Level		
Primary	Ref	
Secondary	0.45(0.05,4.23)	0.459
Tertiary	0.84(0.09,7.49)	0.867

Discussion

Breast cancer is the most commonly diagnosed cancer worldwide and the leading cause of cancer death, with roughly 1.4 million new breast cancer cases and 458,000 deaths in 2008 [12-14]. It is also a major cause of mortality among cancer related diseases. However, little attention is paid towards the heavy mental toll of cancer both to the women and those who interact with them. The findings from this study revealed that more than half (59.4%) of the breast cancer patients had depression. Most of the patients

with depression had mild depression (35%). Only 6% had severe depression while 18% had moderate depression. These findings agree with previous data on prevalence of depression among breast cancer patients. For instance, noted that cancer and treatment-related symptoms can be major stressors in a patient with breast cancer who is undergoing treatment for the disease [15]. The adverse effects of breast cancer or treatment-related symptoms and types of treatment have been associated with different domains of quality of life [16]. High levels of depression in breast cancer can also influence coping with cancer and quality of life adversely [17]. More than half of the patients with breast cancer in this study had depression of some form. This shows that breast cancer patients face serious mental health challenges. However, most of the breast cancer patients (35%) only had mild depression while 18% had moderate depression. There may be room to cure the mental health challenges of patients before they become severe and which will require more input to cure. Studies in western countries reported a prevalence ranging from 1-56% [18]. Some studies conducted in developed countries revealed a depression prevalence of more than 42% which can also be attributed to an increasingly large aging population. This compared to 59.4% of patients in MTRH show that prevalence falls within a similar margin however a higher rate of depression in developed countries might be as a result of a higher aged population. Research conducted in other contexts however has found a lower prevalence of depression among breast cancer patients. Findings from a study done in Croatia revealed a prevalence of depression of 36.5% among breast cancer patients [19]. Another study conducted in Nigeria revealed a prevalence of 37.2% [20]. The prevalence of depression was 22.0%. In Asian studies, the prevalence was between 12.5%-31% among patients who had breast cancer [21]. The prevalence of depression among breast cancer patients in Ethiopia was 9.1%. The relatively lower prevalence of depression among patients from Nigeria, Ethiopia and Croatia might be attributed to a smaller sample size and a different methodology being used. However, the prevalence of depression found with this study standing at 59.4% is almost twice as high as the rate of prevalence among breast cancer patients in most of the other contexts as illustrated previously noted a prevalence rate of 38%, in Croatia 36.5%; in Nigeria, 37.2%; in Asia, 12.5%-31%. Notwithstanding the possible reasons for the lower numbers in other contexts, the of prevalence of depression in MTRH is very high and calls for a lot of attention and concern. Study conducted in Athens revealed a prevalence of 38.2%. These findings were lower compared to this study because of the difference in economic status, and that the government provides funding that assists the patients with their treatment and they also have good, functioning health systems. Other studies that have been conducted in the study location e.g., reported a prevalence of 13.6% in Eldoret. This figure is lower than that found in our study probably because the study was focused on the entire cancer population. It is clear that the prevalence of psychological distress among breast cancer patients is high. This is true for patients with breast cancer at MTRH (59.4%) and as revealed by other studies showing an almost similar rate of prevalence. However, a prevalence of 59.4% in the study area is higher than the reported average range of prevalence between 1.5% to 46% reported in some other contexts globally. Breast cancer patients especially at MTRH are at higher risk of developing severe depressive disorders.

Associated factors of depression

Further analysis also revealed factors by the patients with breast cancer that may be associated to increased risk of depression. Of the factors that were under scrutiny in this study, it was revealed by table three in the results section that having a late stage of cancer (0.002), employment (0.047), and use of chemotherapy (0.048) was statistically significant therefore suggesting that prevalence of depression among breast cancer patients at MTRH is related to stage two of the cancer, unemployment and use of chemotherapy. These findings suggest that these are the primary factors that increase the risk of falling into depression among the patients with breast cancer especially at MTRH. These findings agree with that factors like Chemotherapy may lead to an increased risk of depression during treatment. The skills and strength to cope with the recovery challenges and problems caused by the disease are also associated with the stage of the disease and treatment environment. In yet another study by, it was revealed that there was a correlation between prevalence of depression and level of household income among Chinese women hence suggesting that earning which is primarily through employment has an impact on the mental status of women. However, most of the research appears to be focused on how employment affects cancer survivorship in the post recovery period.

Unemployment

The diagnosis of breast cancer has significant cost implications to the patient because treatment and management of cancer is often expensive. It is likely that the lack of employment has an impact on the ability of the patients to afford cancer treatment, to have a much comfortable lifestyle and on their strength and ability to survive. Few studies have been conducted on the impact of unemployment during treatment of breast cancer patients. Most of the research focuses on the impact of breast cancer on impact on employment and impairments that also arise out of the disease. There is need to address the status of employment among cancer patients because a majority of those who are diagnosed with

cancer may be relying on salaries to pay for treatment. The mean age of breast cancer patients in this study was found to be 40 years illustrating that most of the patients were above the age of 40. It is also likely that a number of these patients are well approaching retirement age or already retired thus making the access to funds for treatment even more critical. The affordability of treatment of breast cancer remains costly to the patient with estimates suggesting that it could be at least 40% of household income in Kenya. The loss of employment by breast cancer patients puts them at risk of not being able to afford treatment which affects their mental preparedness and may lead to depression and significantly affect their survival outcomes.

Chemotherapy

A number of studies have previously found that depression in breast cancer patients seems to be tied to chemotherapy cycles. For instance, concluded that there was no significant difference or relationship between depression level and chemotherapy cycle. The number of people who survive breast cancer has significantly increased in recent years due to advances in detection and treatment, aggressiveness of the treatment exposes the patients to various treatment side-effects. One of this effects that is often overlooked is depression. Although illustrated that patients undergoing chemotherapy with little response were likely to feel depressed than in instances where the chemotherapy session leads to no response; agrees that depression is a frequent diagnosis following the diagnosis of breast cancer and that in an already burdened mental state after the diagnosis of breast cancer, the difficulties due to chemotherapy and a series of social and family problems escalate the issue which can quickly lead to depression. That symptoms that may be related to depression were common among breast cancer patients undergoing chemotherapy with weakness and dry mouth being the most prominent symptoms recorded. The researcher concludes and recommends for adoption of innovative approaches that reduce tumors in record time and with less side effects. The literature stated above partly agrees with findings of this study that showed that compared to adjuvant chemotherapy, the participants on neoadjuvant chemotherapy and palliative chemotherapy had 830% and 850% increased odds of having a diagnosis of depression among patients with breast cancer (OR: 9.43(95% CI: 1.5, 185.32) and 9.5(95% CI: 1.62, 181.81) respectively. Neoadjuvant chemotherapy refers to the use of chemotherapy to reduce the size of tumors prior to the main treatment [26]. Perhaps this causes more anxiety among cancer patients because they are waiting for the outcome of the approach and are very uncertain of the outcome. This might therefore be a source of depression. That adjuvant chemotherapy may lead to increased risk of depression and anxiety or both but only after treatment. Palliative chemotherapy on the other hand as defined by chemotherapy that is given in the non-curative setting to optimize symptom control, improve quality of life (QoL) and ideally to improve survival [27]. Women undergoing chemotherapy present with a higher rate of depression but never mentioned what type of chemotherapy presented most risk to depression among this group. Palliative chemotherapy is offered to the terminally ill not to cure but to improve survival and quality of life. The fact that the breast cancer is untreatable puts strain on the mental health of patients and it is easy to develop a feeling of hopelessness which may lead to depression. Although depression occurs commonly across patients with breast cancer at the end of life, it is not inevitable. Furthermore, the data on depression among the terminally ill is not precise [28]. There is under diagnosis and misdiagnosis of depression among patients with breast cancer that are terminally ill which can result in needless suffering. The plethora of symptoms that plague terminally ill patients can result in uncertainty on whether the symptoms are as a result of the physical toll of the disease or they are symptoms of depression. Confirms that terminally ill breast cancer patients are faced with enormous symptom burden with the prevalence of depression being 48% of the affected population. That most breast cancer patients try to accept their potential demise and the importance of a supportive environment to help the patients accept their condition [29]. There is need for more robust studies on depression among breast cancer patients particularly undergoing palliative care.

Cancer stage

The study also discovered that compared to the early stage of cancer, the participants with late stage of cancer had 61% increased odds of having a diagnosis of depression among patients with breast cancer, OR: 1.61(95% CI: 0.63, 4.17) shown in Table. This agrees with who stated that psychiatric disorders are more prevalent among cancer patients than the general population with the most common mental disorder affecting such patients being depression [30]. Although some attention particularly in the western countries has been pointed towards the mental distress among such patients, there seems to be a lack of adequate recognition of this challenge. This is partly because of a lack of disclosure by breast cancer patients and that the patients also underestimate their symptoms. Notes that fatigue, loss of energy, insomnia and hypersomniaare almost universal symptoms associated with advanced breast cancer. Most critically, it was found that tiny differences in the application of symptom severity thresholds could cause huge variations in the prevalence rates of depression [31-50].

That patients with advanced cancer were more likely to fall into depression than those ones whose cancers where in early stages. Surprisingly, the presence of metastases was not associated with

depression in women with breast cancer. The reason for this is still unclear. In another study by, it was found that a younger age is a well-known risk factor for emotional distress when it comes to breast cancer. However, the relationship between age and depression among patients with breast cancer was not significant in this study [51-60].

Conclusion

This study has traversed through the prevalence of depression among patients with breast cancer which has revealed that 59.4% of the patients at MTRH were found to have some form of depression. This figure was markedly higher than depression rates among breast cancer patients in studies conducted in other contexts across Asia and developing countries. The rate of depression in these other studies was within the range of 12%-40% with most of the prevalence rates in the region of 30%-37%. Having a prevalence rate of 59.4% is twice as high as the prevalence rates mentioned in most of the other research papers cited in this study therefore revealing that depression is a major problem among breast cancer patients at MTRH. It is also an indication of the lack of attention towards the mental status of these patients. Further analysis revealed that the three most primary factors that were significantly associated to increased risk of depression among patients with breast cancer was employment status, stage of cancer and use of chemotherapy. Subsequent discussions illustrated that employment status was a major source of concern because lack or employment lessens the ability of patients to afford critical care therefore increasing their chances of mortality. The realization that affording treatment is not easy and yet the disease is fatal if not adequately and quickly treated can easily be a source of depression among breast cancer patients. Previous literature also revealed that the cost of treatment in Kenya is 40% of the household income. Breast cancer is therefore a huge burden to the patient's financial capability and will likely worsen the mental status of the patient if they are unemployed leading to hopelessness and eventually depression. The study also illustrated that chemotherapy particularly adjuvant and palliative chemotherapy had a heavy toll on the breast cancer patients with significant after effects including weakness. The lack of attention on the mental status of breast cancer patients particularly during terminal cancer was found to be a major source concern because depression is a common ailment in the terminally ill patients. Depression can cause of unnecessary suffering for the patients. Part of the reason for lack of attention on the depression among the terminally ill was also partly as a result of the patients underestimating their feelings and therefore not reporting their symptoms. The caregivers were also responsible for underdiagnoses and misdiagnosis of depression among breast cancer patients. This calls for adoption of innovative and effective approaches that are unlikely to cause more severe outcomes on the mental status of breast cancer patients. Chemotherapy is also tied to the stage of breast cancer because the stage of cancer determines the type of chemotherapy treatment that breast cancer patients will be given. This study found that patients in advanced stage have increased chances of falling into depression compared to those one in earlier stages of cancer. Previous studies have also attested to this and have noted the most prevalent symptoms among breast cancer patients in the advanced stage to be fatigue, loss of energy, insomnia and hypersomnia. These are symptoms of depression. Although some attention particularly in the western countries has been pointed towards the mental distress among such patients, there still seems to be a lack of adequate recognition of this challenge. Care should be exercised in the application of symptom severity which can cause huge variations on the rate of depression hence causing a hugely erroneous picture of the rate of depression among breast cancer patients [61-70].

Recommendations

The above information obtained from this study has major clinical significance, mainly in the development of guidelines for early identification of depression among breast cancer patients. This study therefore recommends:

- Early psychological support should be incorporated into the management of patients with breast cancer;
- Screening for depression should be initiated for a patient with cancer at all points of interaction with patients;
- MTRH and other stakeholders should invest in the establishment of new funds and the strengthening of already existing funds that are meant to support the treatment and care of breast cancer patients especially for those patients that lack employment. This will go a long way in ensuring some form of relief to the patient with regard to the ability to afford effective treatment and therefore bringing hope to the patient and possibly helping them to avoid depression;
- More investment by MTRH in creating further awareness to the public on the need for routine and early screening in order to avoid the diagnosis of cancer in its late stages. This will reduce the frequency of patients with advanced breast cancer and therefore the rate of depression among patients will also reduce;
- Owing to the heavy physical toll of chemotherapy (palliative and adjuvant chemotherapy) to the breast cancer patients, there is need to:

Accompany the chemotherapy sessions with frequent psychological tests for depression and common mental health challenges [71-75];

- Need for basic sensitization and education among care givers on how to isolate symptoms related to depression from those that are as a result of the physical effects of the breast cancer and other mental health problems;
- Need for sensitization and education programmers targeting patients in order to eliminate the fear, stigma and wrong assumptions about mental health issues in order to encourage reporting of all feelings that may be symptoms of depression by breast cancer patients;
- Special attention to be paid to patients under palliative care with very frequent mental assessments to foster acceptance.

Suggestion for Further research

- Need for more research to determine the extent to which different treatment methods of breast cancer affect the rate of depression in Kenya;
- Need for more research to determine the level of awareness of mental health issues among care givers of breast cancer patients;
- Further research on the status and ability of breast cancer patients to access treatment and its effect on mental health status of patients.

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