



# Ten-year Retrospective Study of Breast Cancer Presentation: Insights from a Nigerian Tertiary Palliative Care Center

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

**Introduction:** Breast cancer is the most frequently diagnosed cancer among women globally and a leading cause of cancer-related death. In Nigeria, late-stage presentation of breast cancer is common due to poor health-seeking behavior and limited access to treatment. This retrospective study aims to assess the patterns of breast cancer presentation over a ten-year period at the Hospice and Palliative Care Department, University College Hospital, Ibadan, Nigeria.

**Methodology:** This retrospective analysis included 316 breast cancer patients who presented at the department between January 2012 and January 2021. Data were retrieved from hospital

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records and included patient demographics, tumor localization, metastatic sites, presenting symptoms, and outcomes. Descriptive statistics were used to summarize the data, and findings were analyzed using SPSS.

**Results:** Of the 1,494 cancer patients seen during the study period, 316 (21%) had breast cancer. The peak incidence occurred in 2016 (28.2%) and 2020 (26.6%), with the lowest in 2017 (16.8%). The average age of diagnosis was 49 years. Tumor localization was evenly distributed between the right (43%) and left (43%) breasts, with 13% presenting with bilateral involvement. Metastatic spread was most common to the lungs/pleura (40%), liver (19%), and brain/CNS (13%). Common presenting symptoms included fatigue, weight loss, breathlessness, pain, and anorexia. Regarding parity, 43.7% of patients had more than four pregnancies, indicating a significant correlation between higher parity and breast cancer incidence in the study population.

**Conclusion:** The persistent trend of late-stage breast cancer diagnosis in Nigeria necessitates urgent action to enhance early detection and comprehensive palliative care. Community-based education, improved healthcare access, and targeted research are essential to address the challenges and improve outcomes for breast cancer patients in Nigeria. The study provides valuable insights for clinicians and policymakers to develop effective interventions and health policies.

*Keywords: Breast cancer; palliative care; metastasis; late-stage diagnosis; Nigeria.*

## 1. INTRODUCTION

The National Institute of Cancer (NCI) defines cancer as a disease characterized by the uncontrolled growth and spread of cells [1]. Initially localized, these abnormal cells can expand, forming masses or tumors that may cause serious or even life-threatening symptoms. Breast cancer is the most frequently diagnosed cancer among women and is one of the leading causes of cancer-related death globally [2]. According to the NCI, common indications of breast cancer include changes in breast shape or size, skin dimpling, nipple discharge, and persistent tenderness [1]. As the disease progresses and metastasizes, it often spreads to common sites such as the bones, lungs, and brain [3]. Which then leads to severe symptoms such as extreme fatigue, weight loss, breathlessness, and bone pain [4]. The majority of breast cancer patients in developing low- and middle-income countries such as Nigeria often present with advanced and metastatic lesions, as opposed to patients in high-income developed countries where the rate is lower [5]. This is often due to poor health-seeking behavior, reduced access to treatment options, higher costs of treatment, and associated reduced quality of life [6].

Cancer remains a major global health challenge, with millions of newly diagnosed cases annually. According to the Global Cancer Observatory, lung cancer is the most commonly diagnosed cancer worldwide, with 2.5 million diagnosed cases in 2022 followed closely by breast cancer,

affecting 2.3 million women in the same year [7]. In terms of mortality, lung cancer also leads, being responsible for 1.8 million deaths globally. Breast cancer, while the fourth most common cause of cancer death globally, is the most lethal among women, causing 666,103 fatalities in 2022 [7,8]. In Nigeria, breast cancer is the most commonly diagnosed cancer, and accounts for the commonest cause of cancer-related deaths [9].

Concerningly, there is an upward trend in breast cancer cases in Nigeria; in 2018, it accounted for only 22.7% of new cases and led to 12,000 deaths [7]. Furthermore, the presentation of breast cancer in Nigeria is consistently diagnosed at later stages, when only chemotherapy and palliative care may be offered, and is more frequently the triple-negative variant, and thus far more fatal, contributing to Nigeria having the highest age-standardized mortality rate globally [10]. Existing evidence also suggests that breast cancer in Sub-Saharan Africa also disproportionately affects younger women, which poses significant challenges to their participation across various industrial sectors [11]. This results in an unexpected loss of productivity, negatively impacting the economic stability and GDP of many countries in the region [12].

Breast cancer particularly in its advanced stages can be characterized by several physical, psychological, social, and financial manifestations that have the potential to negatively impact the quality of life of the patients

and their caregivers [13]. These patients and their caregivers have complex needs that need to be tactically addressed to reduce the burden of disease and help improve their quality of life. An interdisciplinary approach to palliative care remains the choice of management in many of these patients. Palliative care is defined by the World Health Organization as an interdisciplinary approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering utilizing early identification and impeccable assessment and treatment of pain, illnesses, including other problems whether physical, psychosocial, and spiritual [14].

Palliative care in cancer care aims to improve the quality of life of these patients and help them maintain their independence while also providing psychological and physical support for them and their caregivers [15]. The World Health Organization has counseled that palliative care (PC) be commenced immediately after the diagnosis of cancer and should be combined with conventional cancer care to address the care needs of these patients [16]. Furthermore, according to the World Health Organization WHO, palliative care has been recognized under the human rights to health and should be provided through person-centered and integrated health services that pay special attention to the specific needs and preferences of individuals [17]. By addressing the physical, psychosocial, and spiritual needs of these patients, PC ensures improvement of the quality of life of these patients with any life-limiting illness as well as their family and caregivers [15]. Studies have shown that individuals with invasive and metastatic cancer who receive early incorporation of PC have a greater quality of life when compared to patients who do not and are managed with conventional cancer care such as radiotherapy and chemotherapy [18]. Considering the benefits of palliative care in the management of cancer patients, and how critical this care is to the final cancer care outcome survival of the patient, and well-being of the caregiver, it is imperative that cancer patients and caregivers have an adequate and accurate awareness about palliative care and their rights to be offered this vital care. However, studies have shown that many cancer patients have poor awareness of palliative care, which has been linked to the late or underuse of palliative care services [19].

The impact that breast cancer is having on Nigeria and Africa as a continent is very real and severe. Unless urgent action is taken, it will continue to ravage her people, exacerbate healthcare disparities, and place ever more strain on the already fragile healthcare systems of the country and continent. This retrospective study at the Hospice and Palliative Care Department, University College Hospital, Ibadan aims to assess the prevalence of breast cancer in patients seen at the department over the past ten years. This period of study is significant as there are limited long-term analyses conducted within Nigerian palliative care settings available in the existing literature. Through identifying some associated risk factors, common areas of metastasis, and prevalent symptoms among these patients, we aim to contribute valuable insights to clinicians that would be useful in screening and identifying potential palliative care needs of breast cancer patients and inform future interventions and management strategies that can significantly improve patient outcome. Furthermore, the findings from this study will also serve as a foundation for the development and refining of health policies and interventions to improve knowledge and access of breast and other cancer patients to help improve the quality of life of these patients and reduce the burden of breast cancer in Ibadan and Nigeria as a whole.

## 2. METHODOLOGY

### 2.1 Study Design and Population

This study was a retrospective analysis conducted at the Department of Hospice and Palliative Care at University College Hospital (UCH), a tertiary, multi-specialist center and federal government-owned facility in Ibadan, Nigeria, and covered ten years from January 2012 to January 2021. The aim was to assess the prevalence of breast cancer and identify associated risk factors, areas of metastasis, and symptoms in patients. The study population involved 1690 patients who presented to the Department of Hospice and Palliative Care, with 1494 of them having a definite cancer diagnosis and 316 of them being specifically breast cancer within the ten-year study period. Ethical approval for the study was granted by the appropriate institutional review boards. As this was a retrospective study involving no direct contact with patients and utilizing previously collected clinical data, patient consent was waived under the stipulated guidelines which prioritized patient anonymity and data security.

## 2.2 Data Collection

Data were retrieved from the hospital's health records which included biographical data, clinical findings at the time of diagnosis such as age, identified risk factors, areas of metastasis, presenting symptoms, and outcomes. Specific details such as the site of breast cancer occurrence (right, left, or bilateral), the spread of metastases (e.g., lungs, liver, brain), and age at first diagnosis were meticulously recorded. To ensure the accuracy and reliability of the data cross-checks were performed on the collected data. Discrepancies were addressed by revisiting patient records for verification.

## 2.3 Inclusion/Exclusion Criteria

The inclusion criteria specified patients with a confirmed diagnosis of breast cancer whose records were available for the entire duration of the study period. Patients with incomplete records or those who had not been managed exclusively within the department were excluded.

## 2.4 Statistical Analysis

The data were analyzed descriptively. Frequencies and percentages were calculated for demographic characteristics, the prevalence of cancer, and clinical features. The analysis aimed to understand the distribution of cancer cases, age at diagnosis, and the prevalence of metastatic sites. The statistical analytic tool used was Statistical Packages for Social Sciences (SPSS) and involved simple quantitative methods to manage and summarize the data, focusing on providing a clear picture of the breast cancer cases handled by the department over the specified period.

## 3. RESULTS

The retrospective analysis involved a total of 316 breast cancer patients treated between January 2012 and January 2021, representing 21% of the 1,494 cancer patients seen at the department over the decade, as seen in Table 1. It also further shows that breast cancer presentation at the hospice department reached its highest point in this study in 2016 followed by 2020 with 28.2% and 26.6% of the total cancer patients being diagnosed with breast cancer. The incidence of breast cancer reached its nadir in 2017 as only 16.8% of the total cancer patients turned out to have presented due to breast cancer. The demographic distribution demonstrated a substantial majority of female patients (99.7%) with only a single male patient (0.3%). The age of patients at diagnosis ranged widely from 18 to 92 years, with the average age being 49 years. The predominant age group affected by breast cancer was 41 to 50 years, indicating a higher vulnerability in premenopausal and perimenopausal women. In terms of tumor localization, as shown in Table 2 below, the distribution between the right and left breasts was equal, with each side affecting 43% of the cases, while bilateral involvement was observed in 13% of the cases. Such distribution simply indicates the absence of lateral preference in breast cancer occurrence within this population.

Most cases of breast cancer are seen among women who are about 50 to 69 years old and have attained menopause. However, in case of the presence of predisposing factors, cancer may start sooner, such as 40 years.

**Table 1. Total number of patients, total number of cancer patients, and total number of breast cancer patients across the study years**

Years	Total patients	Total cancer patients	Total breast cancer patients	Percentage (%)
2012	249	200	37	18.5
2013	190	169	30	17.8
2014	134	127	31	24.4
2015	131	123	25	20.3
2016	176	142	40	28.2
2017	150	131	22	16.8
2018	201	185	39	21.1
2019	183	168	32	19.0
2020	178	158	42	26.6
2021	98	91	17	18.7
Total	1690	1494	316	21

**Table 2. Showing the distribution of breast cancer cases**

Distribution of breast cancer cases	Number of patients	Percentage (%)
Right breast	136	43
Left breast	135	43
Bilateral	43	13
No info	2	1
Total	316	100

**Table 3. Showing the common area of breast cancer metastases in presenting cases**

Area of metastases	Number of patients	Percentage (%)
Lung/pleura	127	40
Liver	61	19
Brain/cns	42	13
Spine	40	12
Bones	30	9
Lymph nodes	23	7
Chest wall	18	6
Contralateral breast	16	5
Axilla	11	3
Peritoneum	4	1
Abdomen/bowel	4	1
Bladder/kidney	3	1

**Table 4. Showing the distribution of age at first confinement**

Age Range	Number of Patients	Percentage (%)
<20	42	13
21-25	65	21
26-30	61	19
31-35	23	7
>35	11	4
No Info	114	36
Total	316	100

Rates of breast cancer are low in women under 40. About 4% of women diagnosed with breast cancer in the U.S. are younger than 40 [6]. Rates begin to increase after age 40 and are highest in women over age 70.

The study identified the age at menarche (as in Fig. 1 below) among patients with breast cancer, revealing the onset of menarche with ages ranging from 10 to 20 years. The most frequently reported age at menarche was 18 years, observed in 12 patients (3.8%). The distribution shows a higher concentration of menarche onset in the later teenage years, suggesting a trend that might correlate with environmental, nutritional, or genetic factors among the population studied. Furthermore, analysis of parity (as shown in Fig. 2) among the breast cancer patients showed that a significant portion of the cohort was multiparous. The most common parity status reported was greater than

four pregnancies (>P4), involving 138 patients (43.7% of the cases). This data suggests a notable trend where higher parity correlates with the incidence of breast cancer in the study population.

The study also detailed the metastatic spread of the disease, which was found to be most prevalent in the lungs/pleura (40% of cases), followed by the liver (19%) and the brain/CNS (13%). Lesser extents of metastasis were noted in the spine (12%), bones (9%), and lymph nodes (7%), with other regions like the chest wall, contralateral breast, axilla, peritoneum, abdomen/bowel, and bladder/kidney having lower incidences. The analysis of age at first confinement among breast cancer patients revealed significant insights into reproductive patterns. The majority of patients (65 individuals, representing 21% of the cohort) had their first child between the ages

of 21 and 25. The next most common age group was 26-30 years, with 61 patients (19.3%). Notably, the data showed a lower number of first confinements at later ages, with only 11 patients (3.5%) having their first child at ages over 35. A considerable portion of the dataset lacked specific age information, with 114 cases (36%) not recorded.

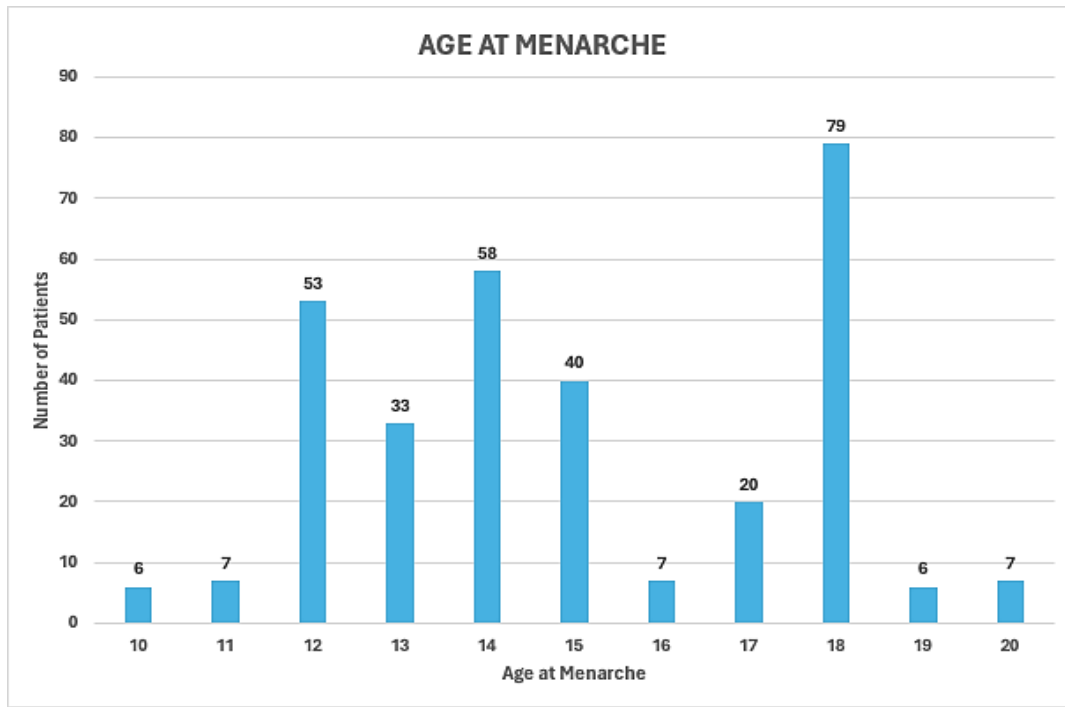


Fig. 1. Showing the distribution of number of patients and age at menarche

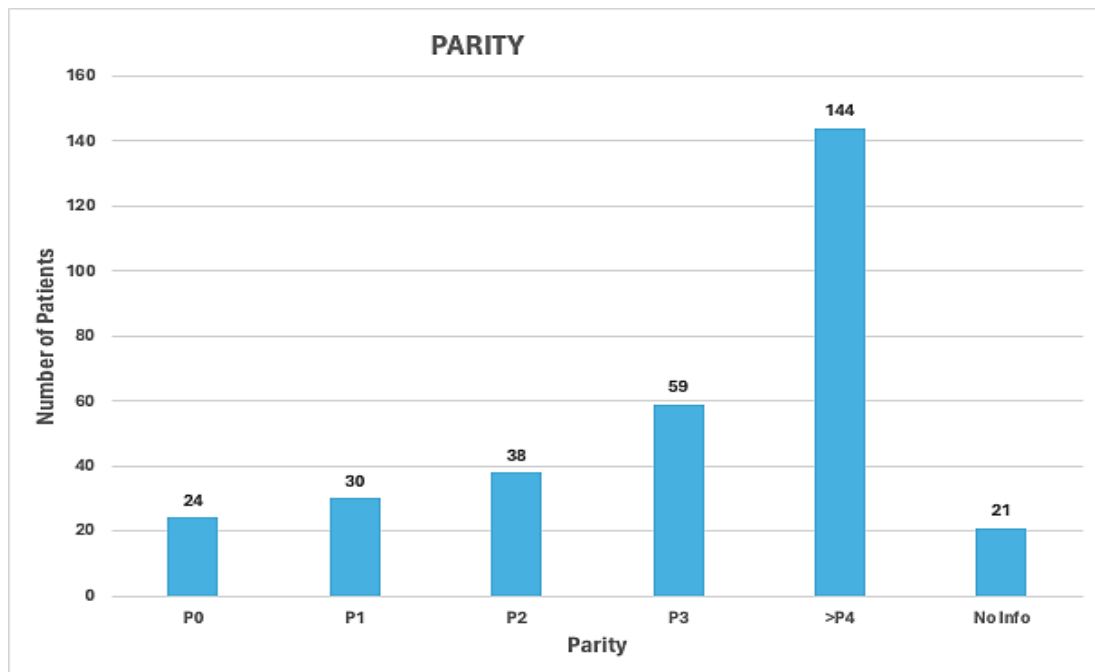
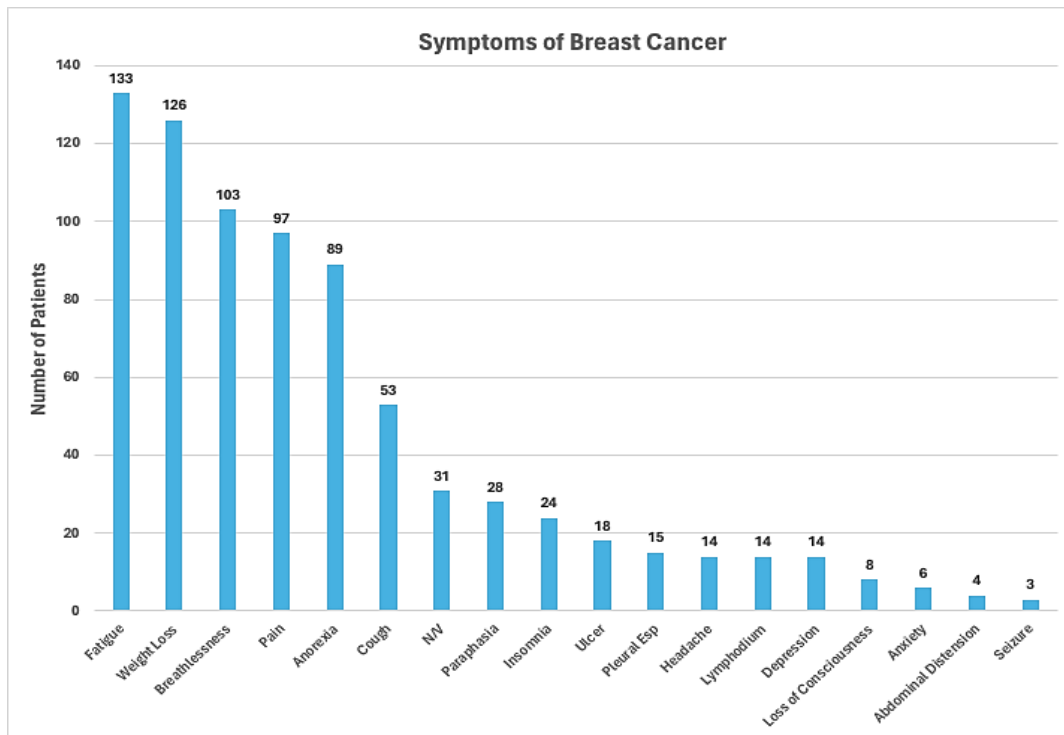


Fig. 2. Showing the distribution of parity and their corresponding number of patients



**Fig. 3. Showing the distribution of presenting symptoms and the corresponding number of patients**

Symptomatology at diagnosis shows a significant number of patients presenting with multiple symptoms and 80% presenting with three or more symptoms with most reported ones being fatigue, weight loss, breathlessness, and pain, indicating the aggressive nature and advanced stage of disease at presentation. This symptom burden highlights the clinical severity at diagnosis and further points to the challenges in managing advanced breast cancer in a palliative care setting. Survival data indicated that approximately 20% of patients diagnosed with metastatic breast cancer survived beyond five years, which, while aligning with global survival statistics for metastatic breast cancer, points to the critical need for early detection and intervention. Furthermore, the annual prevalence of breast cancer among the total cancer patients treated each year showed fluctuations ranging from a high of 15% in 2012 to a low of 6% in 2021. This variability suggests changes in diagnostic rates, possibly influenced by public health initiatives or alterations in referral patterns to the department.

#### 4. DISCUSSION

In this study, we reviewed breast cancer patterns of breast cancer presentation at the Department

of Hospice and Palliative Care of a teaching hospital in southwestern Nigeria. This study aimed to provide some insight and knowledge into presentation patterns of breast cancer at the hospice and palliative care unit, furthermore, we also aimed to identify the palliative care needs of breast cancer patients seen managed at a tertiary cancer center in Nigeria. In order to map the needs, interventions, and outcomes of palliative care for these patients, patterns of breast cancer and other cancers, particularly those that present at the hospice and palliative care department, are crucial. This data, which is based on scientific evidence, is crucial for allocating resources to improve access to and uptake of hospice and palliative care, especially in the fight against cancer. This is particularly important in a country like Nigeria, where palliative care is imperative in the management of many cancer patients due to the prevalence of late cancer presentations, furthermore, there is a paucity of studies accurately documenting patterns of presentations and outcomes among cancer patients receiving palliative care.

The prevalence of breast cancer was highest in the 41-60-year-old age bracket in our study, accounting for about 54% of the total number of patients seen, ages 21-30 had the lowest

incidence among the breast cancer patients seen. This is similar to a study by Olaogun et al in 2020 which showed that among 82 breast cancer patients seen, the peak age of incidence was in the 4<sup>th</sup> decade closely followed by the 6<sup>th</sup> decade, with a mean of 48.9 +/- 14.9 years, and a median of 47.5 years [20]. Over 50% of the total breast cancer cases were seen in patients aged 50 years old and younger, which portrays a skewness towards a younger demographic in Nigeria (and Africa at large) and further emphasizes the need for early breast cancer prevention interventions. This is however contrary to studies in North America, Europe, and Asia where the majority of breast cancer patients are post-menopausal and are in their 5<sup>th</sup> – 6<sup>th</sup> decade of life. The majority of the patients were females with only one male patient (0.3%) represented, which is similar to many documented studies in literature. The right and left breasts had an equal distribution of breast cancer cases (43%), with only 13% presenting with bilateral breast lesions. This is contrary to a study by Sughrue T et al in 2014 which showed that breast cancer is roughly about 5-13% more likely to develop on the left side than on the right side [21].

Our results show that the incidence of breast cancer presentation varied over the years with no specific increase or decline, the highest number of patients (42 patients) was seen in 2020, and the lowest (17 patients) was seen in 2021. This is contrary to the documented rising incidence of breast cancer in Nigeria, as studies have shown that there has been an increase in the incidence of breast cancer globally and specifically in Nigeria. Olasehinde et al in 2022 reported that the incidence of breast cancer in Nigeria which is currently at 54.3/100,000 has significantly risen over the last 10 years, and is projected to continue to increase in the coming years [22]. This could be due to the poor awareness and attitude toward palliative care among these patients and healthcare professionals, a study by Adenipekun et al showed that 72.3% of participants had no idea what palliative care means, and only 23.1% had an idea of palliative care [23]. Considering the immense importance of palliative care in the management of breast cancer patients, this should serve as a wake-up call, particularly among health and palliative care providers to improve palliative care awareness and access among cancer patients in Nigeria. Palliative care awareness and uptake in Nigeria is still subpar, and this could explain the low number of patients seen in 2021. In 2021, there

was a creation of National Policy and strategic plan for Hospice and Palliative care which has the goals of promoting palliative care as an integral part of a comprehensive package of health care made available to all Nigerians, and ensuring that PC services are integrated into service delivery, especially at primary, secondary and tertiary care levels [24]. This shows that Nigeria as a nation is already on the right path to improving access and uptake of palliative care. However, despite this national policy, many Nigerians with advanced cancers and their caregivers have complex palliative care needs which go by unmet and has the potential to negatively impact their quality of life. More work needs to be done particularly in the areas of palliative care awareness to improve the accessibility and uptake of palliative care services by these needing patients.

Our study shows that the majority of the patients with breast cancer who were managed at the hospice and palliative care unit presented with fatigue, weight loss, breathlessness, pain, anorexia, and cough in descending order. These symptoms are commonly seen among breast cancer patients, particularly in advanced and metastatic cases and they can cause patients and caregivers severe distress, negatively impacting their quality of life. Some of the symptoms commonly seen in breast cancer include symptoms from the cancer itself such as fatigue, breathlessness, pain, and anorexia, or side effects from cancer treatments such as nausea, vomiting, constipation, hair loss, lymphedema, and financial toxicity [25]. A study by Adesunkanmi et al in 2016, reported pain was the commonest symptom reported by about 100 breast cancer patients seen over 8 years in a teaching hospital in Nigeria [12]. Similarly, in another study by Nina Galipeau et al in 2019, fatigue, pain, and a lump in the breast were the three most common disease-related symptoms, while hair loss, fatigue, and nausea were the three most common treatment-related side effects [26]. Palliative care aims at managing these symptoms and providing emotional and psychosocial support for these cancer patients and their caregivers to improve their quality of life, thus indicating that palliative care is pivotal in the management of every stage of breast cancer, particularly in advanced metastatic breast cancer. A study by Nathan I Cherry et al in 2018 showed that patients with advanced breast cancer and their families have complex needs that can cause severe distress and undermine their quality of life, and require palliative care to



help optimize the quality of life and well-being of these patients [27]. Furthermore, although this study does not present the care outcomes of these patients due to poor patient compliance, loss to follow up and some other factors, studies have shown that palliative care significantly alleviates distressful symptoms among cancer patients and their care givers and significantly improves their quality of life.

Lung/pleura (40%), liver (19%), brain/CNS (13%), spine (12%) and bones (09%) were the five commonest sites of breast cancer metastases in our study. This further explains why fatigue, weight loss, breathlessness, pain, anorexia, and cough were the commonest presenting complaints seen among these patients. This is in keeping with a Nigerian study by Adisa A et al in 2011, which showed that the commonest sites of breast cancer metastasis were liver (63%), lung parenchyma (51%), pleura (26%), and contralateral breast [28]. Similarly, another study by Berman A et al, showed that the commonest sites of breast cancer were bones (41%), lungs (22%), liver (7.3%), and brain (7.3%) [29]. Metastatic breast cancer is very common in many developing countries like Nigeria, largely due to poor health-seeking behavior, education, and poor access to cancer screening and health care. It is often associated with a severe burden to the patient, their caregivers, and the healthcare delivery system. Many of these patients and their caregivers are usually in severe physical, emotional, and psychological distress, and oftentimes have a very poor prognosis due to the severity and extent of the metastatic lesions. Palliative care is very pivotal in this category of patients as it helps to improve their quality of life by ensuring symptom control and also prolonging their chances of survival.

About 43.7% of the breast cancer patients in our study had greater than four parous experiences, with a significant majority of them have had at least one parous experience. Furthermore, our study shows that the majority of the patients had their first confinement before the age of 30. This is similar to a study by Adesunkanmi et al which shows that 79.2% of the total number of breast cancer patients seen over 8 years have a history of prolonged breastfeeding of their children [12]. Another study by Olasehinde Olalekan et al showed that of the 607 breast cancer patients seen within 8 years, they had a mean parity of 3.8 +/- 1.9 children and the mean duration of breastfeeding was 16 +/- 7 months [22]. Our

study findings contradict claims that increasing parity is protective of breast cancer. A study by M Lambe et al showed that increasing parity was associated with a pronounced decrease in the risk of breast cancer, with each birth conferring a 10 percent risk reduction (?) Patients with more than 10 children are totally protected, as per the reference given. Muslims often have more number of children, and are not proportionately protected.) [30]. Another study by Chenyang Li et al showed a potentially non-linear and protective relationship between increased parity and luminal A and B breast cancer [31].

With adjustment for age at first and last births, high parity was associated with an overall reduced risk of breast cancer (incidence rate ratio = 0.46; 95% confidence interval = 0.36-0.59 for women with five or more children vs uniparous women [32].

This is the first study in Nigeria reporting the awareness and attitude of cancer patients toward palliative care in Nigeria using an adapted validated and reliable knowledge test. The findings from this study hold implications for the improvement of palliative care awareness particularly among patients with chronic illnesses (such as cancer) in Nigeria. Furthermore, this study highlights the current state of palliative care awareness and makes evidence-based recommendations on how to improve palliative care awareness and attitude towards palliative care in Nigeria [33].

Our study has limitations, firstly, this study was conducted retrospectively at a single palliative care center in Nigeria and may not be entirely representative of the pattern of palliative care presentation and management of breast cancer in Nigeria, more studies across multiple palliative care centers in Nigeria are advised. Secondly, this study does not take into consideration the cancer stages and treatment outcomes of these patients, this missing data is equally important as it further supports available literature reporting late cancer presentation among Nigerian cancer patients, and it might also potentially show the impact of palliative care on patient's outcomes. Finally, this study.

## 5. CONCLUSION AND RECOMMENDATIONS

This study conducted at the Hospice and Palliative Care Department of University College Hospital, Ibadan, reveals a persistent and concerning trend of late-stage breast cancer

diagnoses in Nigeria such that a high proportion of patients are diagnosed at advanced stages where only palliative care is feasible considering many of the breast cancer patients seen at the palliative care department already had at least one form of metastases. This therefore highly indicates the necessity of early detection and comprehensive palliative care. Despite the increasing global awareness and advancements in breast cancer treatment, the majority of patients in this region still present at advanced stages, resulting in significant morbidity and impacting overall survival rates negatively. The study also identified a significant trend of breast cancer affecting younger women, which impacts their health and also inadvertently contributes to economic instability due to lost productivity.

The use of molecular profiling in breast cancer includes the following:

- ER and PR status testing.
- HER2/neu receptor status testing.
- Gene profile testing by microarray assay or reverse transcription-polymerase chain reaction (e.g., MammaPrint, Oncotype DX).

On the basis of ER, PR, and HER2/neu results, breast cancer is classified as one of the following types:

- Hormone receptor positive.
- HER2/neu positive.
- Triple negative (ER, PR, and HER2/neu negative).

ER, PR, and HER2 status are important in determining prognosis and in predicting response to endocrine and HER2-directed therapy. The American Society of Clinical Oncology/College of American Pathologists consensus panel has published guidelines to help standardize the performance, interpretation, and reporting of assays used to assess the ER-PR status by immunohistochemistry and HER2 status by immunohistochemistry and *in situ* hybridization.

Gene profile tests include the following:

- **MammaPrint:** The first gene profile test to be approved by the U.S. Food and Drug Administration was the MammaPrint gene signature. The 70-gene signature classifies tumors into high- and low-risk prognostic categories. The aim of the MINDACT trial (NCT00433589) (see below) was to

determine the clinical usefulness and patient benefit of adjuvant chemotherapy.

**Oncotype DX:** The Oncotype DX 21 gene assay is the gene profile test with the most extensive clinical validation thus far and applies to hormone receptor-positive HER2-negative breast cancer. A 21-gene recurrence score is generated based on the level of expression of each of the 21 genes. This recurrence score informs prognosis and treatment decision-making.

To address the challenges of late-stage breast cancer diagnosis and improve awareness of palliative care in Nigeria, a multi-pronged approach is necessary. First, community-based education initiatives should be enhanced to target all demographic groups, utilizing local community leaders and healthcare workers to disseminate information effectively. These programs should focus on educating the public about the early signs and symptoms of breast cancer and the benefits of early diagnosis. Incorporating culturally tailored health messages into local community gatherings, religious functions, and through media such as radio and television can significantly improve the reach of these messages.

### Treatment Types

- Surgery.
- Chemotherapy.
- Radiation Therapy.
- Targeted Therapy.
- Immunotherapy.
- Stem Cell or Bone Marrow Transplant.
- Hormone Therapy.

Furthermore, it is important to integrate breast cancer education into the national school curriculum to instill a culture of health consciousness from a young age. This could include basic information on recognizing potential symptoms and the importance of seeking medical advice promptly. Additionally, training programs for healthcare providers, especially in rural areas, need to be prioritized to ensure they are well-equipped to recognize early signs of breast cancer, manage initial diagnostics, and advise on the appropriate palliative care pathways. Collaborations between the government, non-governmental organizations, and international health agencies could provide the necessary support and resources to establish and maintain breast cancer screening centers, particularly in underserved areas. These centers

would serve as vital points for early detection, education, and referral for further treatment, significantly reducing the late-stage diagnosis rates.

To specifically address the rising prevalence of breast cancer in younger females in Nigeria, targeted research studies are essential. Longitudinal cohort studies that follow young women over several years could provide insights into lifestyle, genetic, and environmental risk factors contributing to the disease. Case-control studies could help identify specific risk factors prevalent in the Nigerian context, informing targeted prevention strategies. These studies should be supported by adequate funding and resources to ensure comprehensive data collection and analysis, leading to actionable health policies.

Finally, there is a need to improve public and professional awareness about palliative care as a critical component of cancer care. Implementing national campaigns that focus on educating both the public and healthcare providers about the principles and benefits of palliative care could demystify misconceptions and promote its earlier integration into cancer care protocols. This approach enhances the quality of life for patients and supports families and caregivers, providing them with necessary resources and support.

#### **DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

#### **CONSENT**

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

#### **ETHICAL APPROVAL**

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

#### **COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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