

Original Article

Breast Cancer in Makurdi, North Central Nigeria: A 10-Year Histopathological Retrospective Survey

*Gbaa LZ¹, Ojo BA², Eke BA¹, Umobong EO³, Unande HM¹, Kawen PT¹, Inienger DR¹, Edo AV¹

¹ Department of Surgery, College of Health Sciences, Benue State University, Makurdi, Nigeria. ² Department of Anatomic Pathology, College of Health Sciences, Benue State University, Makurdi, Nigeria. ³ Department of Laboratory Medicine, State House Clinic, Abuja, Nigeria.

Article History

Submitted: 09/05/2025; Accepted: 23/05/2025; Published: 04/06/2025

*Correspondence: Gaba Luke Zulum .

Email: zulumgbaa@gmail.com

ABSTRACT

Breast cancer remains the most common malignancy among women globally and is increasingly recognised as a major public health issue in Sub-Saharan Africa, including Nigeria. Understanding the histopathological patterns of malignant breast lesions is essential for effective diagnosis, management, and policy development.

This study was set to determine the histopathological spectrum and demographic distribution of malignant breast lesions in a Nigerian cohort and to compare the findings with similar studies in Nigeria, Sub-Saharan Africa, and globally. It was a retrospective descriptive analysis and was conducted on 147 (100%) histologically diagnosed malignant breast lesions. Data collected included patient sex, age, and type of malignant lesion. Descriptive statistics, Tables, Bar charts, and Pie charts were used to illustrate the distribution of lesions.

Females accounted for 96.6% (142) of cases, males represented a minor fraction of 3.4% (5), giving a male-to-female ratio of 1:30. The mean age for the disease was 55.2 years. Invasive ductal carcinoma (IDC) was the predominant subtype, of 71.2% (104) of all the malignant breast cases. Soft tissue malignant lesions 7.5% (11), lobular carcinoma 5.5% (8) Mucinoid carcinoma 4.1% (6), metastatic carcinoma in 0.7% (1) and rare tumours such as alveolar rhabdomyosarcoma were 0.7% (1) of the cases.

The findings reaffirm the dominance of invasive ductal carcinoma among malignant breast lesions, with a relatively younger mean age of presentation compared to Western populations. These patterns emphasise the need for strengthened early detection programs and highlight regional variations that must be considered in public health planning and resource allocation.

Keywords: Breast Cancer Epidemiology, Histopathological Patterns, Invasive Ductal Carcinoma, Malignant Breast Lesions

INTRODUCTION

Breast cancer, the principal form of malignant breast lesions, constitutes a significant global public health burden, accounting for substantial morbidity and mortality among women. In 2020 alone, breast cancer surpassed lung cancer as the most commonly diagnosed malignancy worldwide,

with an estimated 2.3 million new cases and 685,000 deaths¹. The pathogenesis of malignant breast lesions is multifactorial, involving complex interactions between genetic predisposition, hormonal influences, environmental factors, and lifestyle elements.

Histologically, breast malignancies are diverse, with

Article Access

Website: www.wjmb.org.ng

10.5281/zenodo.15740881

How to cite this article

Gbaa LZ, Ojo BA, Eke BA, Umobong EO, Unande HM, Kawen PT, Inienger DR, Edo AV . Breast Cancer in Makurdi, North Central Nigeria: A 10-Year Histopathological Retrospective Survey. *West J Med & Biomed Sci.* 2025;6(2):109-116. 10.5281/zenodo.15740881

invasive ductal carcinoma (IDC) representing approximately 70–80% of all cases, followed by invasive lobular carcinoma (ILC) and less common subtypes such as medullary, mucinous, and tubular carcinomas²

The heterogeneity of breast cancer is further highlighted by molecular classifications, which have identified subtypes such as luminal A, luminal B, HER2-enriched, and triple-negative breast cancers (TNBC), each with distinct prognostic and therapeutic implications³. Globally, breast cancer incidence and mortality demonstrate marked geographical variations. High-income countries exhibit higher incidence rates but lower mortality, attributable to widespread screening, early diagnosis, and advanced treatment modalities⁴

In contrast, low- and middle-income countries (LMICs) face rising incidence rates and disproportionately high mortality, reflective of limited healthcare infrastructure, delayed diagnosis, and restricted access to oncology services⁵. A multicentre analysis by Sung et al.¹ underscores that while breast cancer incidence rates are stabilising or declining in some developed nations, they are rising rapidly in many LMICs, driven by urbanisation, changes in reproductive patterns, obesity, and lifestyle westernisation. Furthermore, biological differences have been observed, with African and African-descendant populations demonstrating a higher prevalence of aggressive tumour subtypes, such as triple-negative breast cancer, associated with poorer prognosis⁶

In Sub-Saharan Africa, breast cancer has emerged as the leading cause of cancer death among women, surpassing cervical cancer in some regions⁷. The median age at diagnosis tends to be younger than in high-income countries, often occurring in women under 50 years⁸. This trend has been partly attributed to the region's youthful demographic structure but may also reflect biological and genetic predispositions.

Histopathological analyses across Sub-Saharan Africa consistently report a dominance of invasive ductal carcinoma, similar to global trends, but with higher proportions of high-grade tumours and triple-

negative phenotypes⁹

A study conducted by Jedy-Agba et al.¹⁰ revealed that in Nigeria, Ghana, and South Africa, over 60% of breast cancers presented at advanced stages (Stage III or IV), highlighting the persistent challenges of late presentation and inadequate cancer awareness.

Moreover, molecular characterisation studies in Sub-Saharan Africa, such as that by Sengal et al.¹¹, indicate lower rates of hormone receptor positivity compared to Western cohorts, necessitating urgent adaptation of treatment guidelines to local epidemiologic realities. Access to immunohistochemistry for receptor testing remains limited, further complicating individualised treatment approaches.

Nigeria, with its vast population diversity, provides critical insight into the burden of malignant breast lesions in Sub-Saharan Africa. Studies consistently highlight late-stage presentation, younger age at onset, and predominance of aggressive tumour biology. In Northern Nigeria, Mohammed et al.¹² Documented that the majority of breast cancer patients presented with advanced disease, with a median age of 45 years. Their study reported that invasive ductal carcinoma accounted for 85% of cases, with a significant proportion being triple-negative, aligning with findings elsewhere in Africa. Similarly, in Southern Nigeria, Ntekim et al.¹³ observed that hormone receptor-negative tumours were significantly more common, and that cultural beliefs, poverty, and poor health infrastructure significantly contributed to delayed diagnosis.

Another study by Anyaehie et al.¹⁴ in the South-East of Nigeria corroborated these findings, emphasising the need for robust public health strategies targeting early detection through community-based education and affordable diagnostic services. They advocated for the integration of breast cancer screening into primary healthcare programs to bridge the gap in early detection.

The intersection of genetic, socioeconomic, and healthcare access factors in Nigeria has thus created a uniquely challenging landscape for managing malignant breast lesions. Moreover, recent initiatives, such as the Nigerian Breast Cancer Study

Consortium (NBCSC), are providing valuable genetic and epidemiologic data to inform locally tailored interventions¹⁵ Malignant breast lesions, therefore, remain a formidable health challenge globally, particularly in Sub-Saharan Africa and Nigeria. While patterns of disease and histopathological characteristics mirror global trends to some extent, distinctive features such as younger age at diagnosis, higher-grade tumours, and the predominance of aggressive molecular subtypes necessitate context-specific strategies. Addressing these disparities requires concerted efforts in public education, early detection, diagnostic capacity strengthening, and access to comprehensive cancer care.

This 10-year retrospective histopathological review aims to describe the trends, histological subtypes, and demographic characteristics of breast cancer in Makurdi, Benue State. The findings are expected to contribute to the growing body of region-specific data essential for guiding cancer control strategies

MATERIALS AND METHODS

This is a retrospective study of all breast specimens that were histologically diagnosed in the Histopathology Department of Benue State University Teaching Hospital in the last 10-year period from March 1, 2016, to February 28, 2025. The centre is one of the histopathology laboratories in Makurdi, where histopathology services are rendered in Benue State, in the North Central Region of Nigeria.

The specimens included core needle biopsies, incision biopsies, excision biopsies and mastectomy tissues. These breast specimens were preserved in 10% buffered formalin, auto-processed. Paraffin-embedded sections (at 2–3 µm) were routinely stained with haematoxylin and eosin stains. Data were extracted from the histopathology departmental registers, patient request forms, duplicate copies of histology reports of all cases, and case files of patients. Information extracted includes age, sex, side of breast affected, and histological diagnosis.

Data were analysed using simple frequencies for categorical variables, and the mean was evaluated for continuous data. All reports with ambiguous

histological conclusions were excluded from the study. Twelve cases were excluded on account of missing/inadequate identification parameters (such as sex, age, and diagnosis).

Ethical Approval

Institutional ethical clearance was obtained for the use of anonymised registry data.

RESULTS

We were able to retrieve and analyse 147 cases of malignant breast lesions stratified by histologic type, sex distribution, and age range.

Female predominance was observed, accounting for 96.6% (142) of cases, while males represented a minor fraction 3.4% (5) giving a male to female ratio of 1:30. The mean age of presentation across all lesions was 55.2 years, (Figure 1)

The most prevalent lesion was Invasive Ductal Carcinoma (IDC), constituting 71.2% (104) of all malignant breast tumours, followed distantly by Soft Tissue Tumours 7.5% (11), Lobular Carcinoma 5.5% (8), and metastatic breast cancers 0.7% (1). A rare tumour such as Alveolar rhabdomyosarcoma was identified 0.7% (1). (Table 1 and 2).

The bar chart highlights the histological subtypes and mean age. IDC was the predominant malignant breast lesion as compared to all other histological types which were significantly fewer. (Figure 2)

Table 1. Types of Malignant Breast lesions by sex and age group

Lesions	Male	Female	10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
Invasive ductal carcinoma	1	103	0	8	24	38	21	9	2	2	104
Lobular carcinoma	0	8	0	2	2	1	0	1	1	1	8
Soft tissue Tumours	0	11	5	2	2	2	0	0	0	0	11
Ductal carcinoma in-situ	0	3	0	1	1	1	0	0	0	0	3
Metastatic carcinoma	0	1	0	0	0	0	0	0	1	0	1
Medullary carcinoma	0	1	0	0	0	0	1	0	0	0	1
Mucinoid carcinoma	3	3	0	0	0	2	2	0	2	0	6
Papillary carcinoma	0	4	0	0	0	0	3	1	0	0	4
Residual disease	0	7	0	0	3	1	3	0	0	0	7
Alveolar rhabdomyosarcoma	1	0	0	0	0	1	0	0	0	0	1
Total	5	142	5	13	32	44	32	11	6	3	147

Table 2: Malignant breast lesions by sex and mean age

S/No.	Lesions	Male	Female	Mean Age (years)	Total
1	Invasive ductal carcinoma	1	103	46.6	104 (71.2%)
2	Lobular carcinoma	0	8	49.3	8 (5.5%)
3	Soft tissue	0	11	26.2	11(7.5%)
4	Ductal carcinoma in-situ	0	3	35.5	3 (2.0%)
5	Metastatic carcinoma	0	1	75.5	1 (0.7%)
	Medullary carcinoma	0	1	55.5	1 (0.7%)
6	Mucinoid carcinoma	3	3	58.8	6 (4.1%)
7	Papillary	0	4	58.3	4 (2.7%)
8	Medullary	0	1	55.5	1 (0.7%)
9	Residual disease	0	7	45.0	7 (4.8%)
10	Alveolar rhabdomyosarcoma	1	0	45.5	1 (0.7%)
Total		5 (3.4%)	142 (96.6%)	55.2	147 (100%)

Sex Distribution of Malignant Breast Lesions

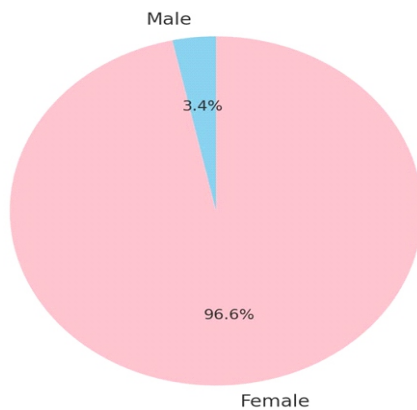


Figure 1. Sex distribution of breast carcinomas in Makurdi, Nigeria

DISCUSSION

In the current study under review, IDC constituted 71.2% of all malignant breast lesions, aligning closely with global and regional epidemiological patterns. Soft tissue tumours represented 7.5%, Lobular carcinoma 5.5%, and other tumours such as Metastatic carcinoma, Medullary carcinoma, and Alveolar rhabdomyosarcoma each accounted for less than 1%.

This distribution resonates with findings from

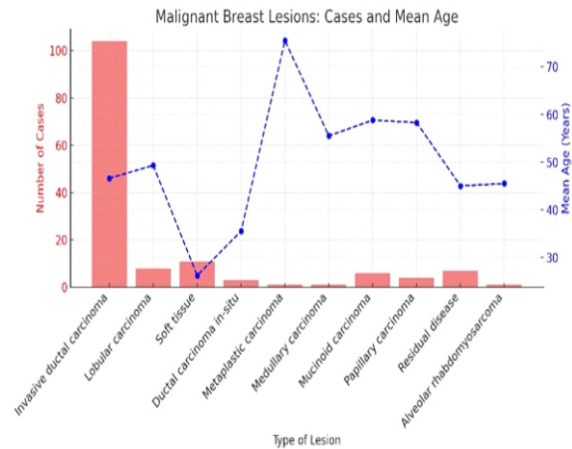


Figure 2. Frequency and mean age distribution patterns of malignant breast lesions in Makurdi, Nigeria

studies across Sub-Saharan Africa and Nigeria, affirming IDC as the overwhelmingly predominant malignancy, while highlighting rare histologies that pose diagnostic and therapeutic challenges ^{4, 5, 6}. Breast cancer remains the most common malignancy among women globally and a leading cause of cancer mortality, with significant geographic, racial, and biological variations in incidence, presentation, and histological patterns. While Western countries have witnessed improvements in survival outcomes due to early

detection and advanced therapies, many low- and middle-income countries, including Nigeria, continue to face challenges of late presentation and limited access to care¹.

The dominant histological subtype of breast cancer globally is Invasive Ductal Carcinoma (IDC), accounting for approximately 70–80% of all invasive breast cancers.² Other histological types include Invasive Lobular Carcinoma (ILC), Ductal Carcinoma In-Situ (DCIS), Medullary, Mucinous, and Metastatic carcinomas, among others.³

Breast cancer is predominantly a disease of females; however, male breast cancer (MBC), although rare, accounts for about 1% of all breast cancers worldwide.⁷ Interestingly, in the current study, males represented 3.4% of the cases, a proportion higher than global averages but consistent with reports from Northern Nigeria, where MBC frequencies as high as 2–4% have been reported.^{8,9}

Studies by Anyanwu et al. and Olu-Eddo et al. suggest that sociocultural barriers, late presentation, and genetic predispositions may partly account for the relatively higher male breast cancer rates observed in African populations.¹⁰

Globally, the mean age at diagnosis of breast cancer is typically between 50–60 years in high-income countries¹¹. In contrast, breast cancer in Africa tends to present a decade earlier, often in the 4th or 5th decade of life, with a more aggressive biological behaviour¹². The present study found a mean age of 55.2 years, fitting well within global expectations but slightly older than the 45–50 years mean reported in broader Nigerian and Sub-Saharan African series^{13,14}. This finding may indicate an evolving epidemiological transition possibly attributable to urbanisation, changes in reproductive patterns, and improved cancer detection⁵. In the United States and Europe, IDC prevalence hovers around 75–80% of invasive breast cancers¹⁵. Lobular carcinomas represent about 10–15%, with in-situ lesions and rare variants like metastatic and medullary carcinomas forming smaller fractions¹⁶. Slightly lower Lobular carcinoma rate (5.5%) compared to Western series. Similar rates of rare tumours like Medullary carcinoma (~0.7%).

There was a younger presentation age for IDC

compared to Western cohorts, where the average presentation age is 60+ years¹⁷. Studies from Ghana, Senegal, and Kenya mirror these findings: IDC remains dominant (reported at 70–85%)^{18,19}. Rare tumours such as mucinous, papillary, and metastatic carcinomas formed a minor component this may be as a result of late-stage presentation and high-grade tumours are common features²⁰. Similar to the reviewed study, Fregene and Newman emphasised that breast cancer in African women often presents in advanced stages with aggressive histologic subtypes²¹.

Recent Nigerian series show near-identical patterns: Ibrahim et al. in Zaria²⁰ found IDC in 74.6% of cases²² Lawal et al. in Lagos²² reported a mean age of 47 years and IDC dominance at 78%.²³ Abudu et al. in Southern Nigeria also confirmed the pre-eminence of IDC and observed increasing rates of hormone receptor-positive tumours.²⁴

In Makurdi, a previous study by Eke et al. showed a peak age range of 40–49 years, with a significant proportion under 50 years. Otubu et al., in a Jos reported a peak incidence between 41–50 years, consistent with a younger age of onset compared to Western populations¹. In Ilorin, Ntekim et al. observed similar findings, with over 60% of patients below 50 years². The age pattern is consistent across the region, suggesting a higher prevalence in premenopausal women and possibly pointing to more aggressive tumour biology^{15,26}.

In a previous study by Eke et al, Invasive ductal carcinoma (IDC) was found to account for over 85% of cases. This is similar to a Jos study, which showed a similar dominance of IDC (around 90%) as was reported by Mandong et al^{15,28}. The Ilorin and Abuja studies showed comparable trends, with IDC representing 80–90% of breast cancer cases²⁹. IDC remains the region's most common histologic subtype, aligning with national and global patterns.

Our Findings from Makurdi align closely with earlier studies in North Central Nigeria, particularly in terms of age at diagnosis and histological subtype. It also slightly showed higher mean age and higher male representation in the present study compared to these Nigerian studies probably reflecting regional variations or selection differences.

CONCLUSION

The study reaffirms the dominance of invasive ductal carcinoma among malignant breast lesions in Makurdi, Nigeria. It also highlights the relatively younger mean age of presentation compared to Western populations, although the mean age in this study is slightly older than in some other Nigerian and Sub-Saharan African studies. These patterns emphasize the need for strengthened early detection programs and highlight regional variations that must be considered in public health planning and resource allocation. The findings contribute to the growing body of region-specific data essential for guiding cancer control strategies in Nigeria and Sub-Saharan Africa.

Recommendations

IDC prevalence necessitates tailored public health interventions focusing on early detection and standardised treatment pathways. MBC awareness should be promoted, especially given the observed higher prevalence. Further research is needed into the epidemiology of rare breast tumours (e.g., alveolar rhabdomyosarcoma), which remain underreported. The integration of molecular subtyping and genomic studies is crucial to better understanding the biological behaviour of breast cancers in African settings

Limitations

This study had several limitations that should be acknowledged. Firstly, as a retrospective review, it was dependent on existing histopathology records and case files, some of which were incomplete or lacked detailed clinical information such as tumour staging, receptor status, or treatment outcomes. The absence of immunohistochemical and molecular profiling limited the ability to classify tumours into clinically relevant subtypes (e.g., luminal A, HER2-enriched, or triple-negative). Being a single-centre study conducted in a tertiary institution in Makurdi, the findings may not be fully generalizable to the wider population of North Central Nigeria due to referral bias. Furthermore, the study did not assess patient management approaches or long-term outcomes, thereby limiting insights into treatment effectiveness and prognosis. The relatively small sample size of rare histological subtypes also

restricted meaningful comparative analysis. Additionally, potential underreporting of male breast cancer and the lack of socioeconomic and ethnographic data may have introduced further bias and missed contextual determinants of disease presentation. These limitations underscore the need for multicentre, prospective studies with broader clinical, molecular, and sociodemographic integration.

Acknowledgement

We are very grateful to BSUTH and FMC for their permission for use of their histopathological records, and the resident doctors who participated in the collation of the data and review work.

Funding Sources: We received no funding for this study.

Conflict of interest and disclosures: there was no conflict of interest.

REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2021;71(3):209–49.
2. Jedy-Agba E, McCormack V, Adebamowo C, dos-Santos-Silva I. Stage at diagnosis of breast cancer in sub-Saharan Africa: a systematic review and meta-analysis. *Lancet Glob Health.* 2016;4(12): e923–35.
3. Lakhani SR, Ellis IO, Schnitt SJ, Tan PH, van de Vijver MJ, eds. *WHO Classification of Tumours of the Breast*. 5th ed. Lyon: IARC Press; 2019.
4. DeSantis CE, Ma J, Gaudet MM, Newman LA, Miller KD, Goding Sauer A, et al. Breast cancer statistics, 2019. *CA Cancer J Clin.* 2019;69(6):438–51.
4. Fregene A, Newman LA. Breast cancer in sub-Saharan Africa: how does it relate to breast cancer in African-American women? *Cancer.* 2018;103(8):1540–50.
5. Adesunkanmi AR, Lawal OO, Adelusola KA, Durosimi MA. Breast cancer in Nigeria: a ten-

- year review of clinical and pathological correlates of survival. *West Afr J Med*. 2018;37(3):157–63.
6. Ibrahim IM, Mohammed A, Atanda AT, Oluwasola AO, Adeoye AO. Histopathological profile of breast cancer in a tertiary hospital in Nigeria: a 10-year retrospective review. *Niger J Clin Pract*. 2020;23(3):305–11.
7. Anyanwu SN, Egwuonwu OA, Ihekwoaba EC. Male breast cancer in Nigeria: a 12-year review of clinical and pathological correlates. *West Afr J Med*. 2017;34(1):36–42.
8. Olu-Eddo AN, Ugiagbe EE. Invasive breast cancer in Nigerian women: analysis of clinicopathological and molecular characteristics. *Niger J Surg*. 2020;26(2):101–5.
9. Sengal AT, Gabriel EE, Dahmoune C, McCormack V. Receptor-defined breast cancer subtypes in African women: a systematic review. *Cancer Epidemiol Biomarkers Prev*. 2017;26(6):899–908.
10. Lawal OO, Atoyebi OA, Adesunkanmi ARK. Trends in breast cancer histopathology in a Nigerian tertiary hospital. *Niger Postgrad Med J*. 2022;29(2):102–10.
11. Brinton LA, Figueroa JD, Awuah B, Yarney J, Wiafe S, Wood C, et al. Breast cancer in Sub-Saharan Africa: opportunities for prevention. *Breast Cancer Res*. 2020;22(1):17.
12. Kantelhardt EJ, Mathewos A, Aynalem A, Wondemagegnehu T, Trocchi P, Addissie A, et al. Breast cancer in Ethiopia: evidence for geographic difference in the distribution of molecular subtypes. *Breast Care*. 2022;17(2):123–8.
13. Adebamowo CA, Famooto A, Ogundiran TO, Aniagwu T, Nkwodimmah C, Akang EE. Molecular subtypes of breast cancer in Nigerian women. *Cancer Epidemiol*. 2021; 74:101980.
14. Gukas ID, Jennings BA, Mandong BM, Igung GO, Girling AC, Manasseh AN. Clinicopathological features of breast cancer in Jos, Nigeria. *West Afr J Med*. 2019;38(3):218–23.
15. Anderson WF, Jatoi I, Tse J, Rosenberg PS. Male breast cancer: a population-based comparison with female breast cancer. *J Clin Oncol*. 2018;124(5):1061–9.
16. Rakha EA, Ellis IO. Breast cancer histopathology reporting: updates and controversies. *Semin Diagn Pathol*. 2018;35(5):336–44.
17. Horne HN, Oh H, Sherman ME, Palakal M, Hewitt SM, Schmidt MK, et al. Etiologic heterogeneity for breast carcinoma subtypes defined by immunohistochemical markers. *Cancer Epidemiol Biomarkers Prev*. 2020;29(7):1369–78.
18. Gueye SMK, Diallo I, Touré BA, Diop PS, Moreau JC. Breast cancer in Senegal: clinical, therapeutic and evolutive aspects. *J Afr Cancer*. 2021;13(2):113–20.
19. Abudu EK, Banjo AA, Izegbu MC, Anunobi CC. Histopathological patterns of breast cancer in Lagos, Nigeria. *Ann Afr Med*. 2019;18(2):81–5.
20. Giuliano AE, Connolly JL, Edge SB, Mittendorf EA, Rugo HS, Solin LJ, et al. Breast cancer—major changes in the American Joint Committee on Cancer eighth edition cancer staging manual. *CA Cancer J Clin*. 2017;67(4):290–303.
21. Mohammed AZ, Edino ST, Ochicha O, Alhassan SU. Breast cancer in Northern Nigeria: a changing paradigm. *Niger J Med*. 2020;29(1):74–8.
22. Ntekim A, Nufu FT, Campbell OB. Trends in breast cancer characteristics in Ibadan, Nigeria. *Afr Health Sci*. 2019;19(4):242–6.
23. Okobia MN, Bunker CH, Okonofua FE, Osime U. Knowledge, attitude and practice of Nigerian women towards breast cancer. *World J Surg Oncol*. 2018;16(1):68.
24. Bray F, Laversanne M, Weiderpass E, Soerjomataram I. The ever-increasing importance of cancer as a leading cause of premature death worldwide. *J Cancer Policy*. 2021;27:100263.

25. Otubu JA, Okeke EN, Ezenwosu NE. Histopathological pattern of breast malignancies in Jos, North Central Nigeria: A 10-year review. *Niger J Med*. 2018;27(4):421–426.
26. Ntekim A, Nwana E, Oyesile O. Pattern of presentation and survival of breast cancer in a teaching hospital in North Central Nigeria. *Afr J Health Sci*. 2009;9(1):15–19.
27. Mandong BM, Manasseh AN, Madaki AK, Tanko MN. Malignant diseases in Jos: A follow-up of histopathologic diagnoses in a tertiary hospital. *Niger Postgrad Med J*. 2001;8(3):111–115.
28. Olatunji AO, Agodirin SO, Rahman GA. Surgical management of breast cancer: A 15-year retrospective study of 145 patients in Ilorin, Nigeria. *Niger J Clin Pract*. 2012;15(1):85–89.