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Breast Cancer Outcomes at a Tertiary Hospital in Yenagoa, Nigeria.

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Article history: Received 06 August 2025, Reviewed 16 November 2025, Accepted for publication 10 March 2026

ABSTRACT

Objective: This retrospective study aimed to identify factors influencing treatment outcomes among female patients diagnosed with breast cancer in a tertiary hospital.

Methods: Data from 84 female patients diagnosed with breast cancer were analyzed. Demographic and clinical characteristics were examined, along with treatment modalities. Treatment outcomes were categorized as good or poor, and logistic regression was used to identify predictors of treatment outcome.

Results: The mean age of patients was 47.11 years, with the 40–49 age group being the most represented (33.3%). A majority of patients had no family history of breast cancer (75.0%) and reported no history of alcohol (81.0%) or tobacco use (92.9%). The commonest presenting symptom was a painless breast lump (78.6%), with 61.9% of patients presenting > 6 months after symptom onset. Surgery and chemotherapy were performed in 86.9% and 64.3% of cases, respectively. Statistical significance for all analyses was set at $p < 0.05$. Bivariate analysis showed significant associations between treatment outcomes and both duration of symptoms ($p = 0.049$) and chemotherapy ($p < 0.001$). Logistic regression identified duration of symptoms ≤ 6 months (OR = 3.01; 95% CI: 1.01–9.00; $p = 0.049$) and receipt of chemotherapy (OR = 12.77; 95% CI: 3.95–41.25; $p < 0.001$) as the independent predictors of good treatment outcomes.

Conclusion: Early presentation and receipt of chemotherapy were associated with good treatment outcomes among female breast cancer patients in this study. Strategies to promote early detection and improve access to chemotherapy are essential for enhancing treatment outcomes.

Keywords: *Breast cancer, outcomes, treatment, Nigeria.*

How to cite this article

Dimoko AA, Alagoa PJ. Breast Cancer Outcomes at a Tertiary Hospital in Yenagoa, Nigeria. The Nigerian Health Journal 2026; 26(1): 93 – 99. https://doi.org/10.71637/tnhj.v26i1.1174

INTRODUCTION

Breast cancer is the most common cancer among women worldwide, with significant morbidity and mortality, particularly in low- and middle-income countries [1]. Breast cancer constitutes 25% of all female cancers in Nigeria, with mortality rates exceeding 50%—nearly double the global average [1]. While high-income countries report 5-year survival rates >90%, Nigerian patients face survival rates 33.3% [2]. This disparity stems from factors such as late presentation, limited treatment access, and socioeconomic constraints [3]. The median time from symptom onset to presentation in Nigeria is 12 months (range 3-36 months) [4] and only 30-40% of patients complete recommended chemotherapy regimens [5]. Prior Nigerian studies identified tumor stage and receptor status as key predictors of treatment outcome but data on modifiable factors remain sparse [6]. Understanding the factors that influence treatment outcomes is essential for developing targeted interventions to improve survival rates. This study aims to identify determinants of good treatment outcome among female breast cancer patients at the Federal Medical Centre (FMC) in Yenagoa, Bayelsa State, Nigeria. By analyzing demographic, clinical, and treatment-related factors, we have provided evidence-based recommendations for improving breast cancer care in our resource limited environment. The study sought to identify the factors associated with good treatment outcome among a cohort of female patients diagnosed with breast cancer.

METHODOLOGY

Design: This study was a hospital based retrospective study employing a longitudinal design. Identified female patients diagnosed with breast cancer were followed up for at least 12 months to determine treatment outcome.

Setting: The study was carried out at the Federal Medical Centre Yenagoa, a 400-bed hospital serving as the only tertiary health facility for the 3.7 million people of Bayelsa State. Yenagoa is the capital of Bayelsa state with a population of approximately 798,000 people. They are mostly served by private clinics run by general practitioners but a lot of people patronize trado-medical practitioners, patent medicine stores and new generation churches for their ailments.

Duration: January 2020 to January 2022.

Population: All patients diagnosed with breast cancer in the hospital within the specified time period.

Study entry criteria:

- Patients seen in the hospital via the general outpatient, surgical outpatient and accident and emergency departments.
- Patients who had a comprehensive history and physical examination carried out including clinical staging.
- Patients who were seen or reviewed by a senior registrar or consultant
- Patients with histologically confirmed breast cancer.
- Patients with properly documented treatment records.

107 patient records were retrieved but only 85 were entered in the study because 22 did not satisfy the entry criteria above.

Data analysis: Data was exported to IBM Statistical Package for Social Sciences (SPSS) version 21.0 for analysis. Qualitative variables were expressed as frequency and proportions while quantitative variables were summarized as means and standard deviations. Bivariate and multivariate analyses were employed to identify determinants outcome. Good treatment outcome was defined as clinical improvement. The presence of complications, death and loss to follow-up were categorized as poor treatment outcome. Bivariate analysis was done using Chi square statistics. Variables with statistical significance ($p<0.05$) on bivariate analysis were entered into a multivariate analysis model which employed logistic regression to adjust for any confounding influence. Odds ratios and confidence intervals were calculated to determine the strength of association between dependent variables (good treatment outcome) and the independent variables (demographic/clinical characteristics). Statistical significance was set at $p<0.05$.

RESULTS

Table 1: Demographic and clinical characteristics of patients diagnosed with breast cancer.

Variables (n=84)	Frequency n	Percentage %
Age in years		
30 – 39	24	28.6
40 – 49	28	33.3
50 – 59	20	23.8
60 – 69	9	10.7
70 – 79	3	3.6
Mean age (SD): 47.11 ± 10.98		

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Variables (n=84)	Frequency n	Percentage %
Positive family history of breast cancer		
Yes	21	25.0
No/Unknown	63	75.0
Use of alcohol		
Yes	16	19.0
No	68	81.0
Use of tobacco		
Yes	6	7.1
No	78	92.9
Breast symptoms		
Painless breast lump	66	78.6
Bloody nipple discharge	7	8.3
Breast pain	6	7.1
Breast ulcer	3	3.6
Recurrent breast swelling	2	2.4
Duration of breast symptoms		
≤ 6 months	32	38.1
> 6 months – 12 months	20	23.8
> 12 months – 24 months	18	21.4
> 24 months	14	16.7

SD – Standard deviation

Table 1 shows that 61.9% of the patients are under the age of 50 years. 25% had a family history of breast cancer while the commonest presenting symptom was painless breast lump which was found in 78.6% of patients.
It was also observed that 61.9% of patients spent 6 months or more with symptoms before initial presentation.

Table 2: Treatment modalities undertaken by patients with breast cancer.

Treatment modality	Frequency n	Percentage %
Surgery		
Yes	73	86.9
No	11	13.1
Chemotherapy (Neo-adjuvant and adjuvant)		
Yes	54	64.3
No	30	35.7
Neo-adjuvant chemotherapy only		
Yes	01	1.90
No	53	98.1
Adjuvant chemotherapy only		
Yes	28	51.9
No	26	48.1

Table 2 shows the treatment modalities undertaken by patients in the study group. 73 (86.9%) had modified radical mastectomy while 54 (64.3%) availed themselves of chemotherapy. Of those who had chemotherapy 53 (98.1%) had both neoadjuvant and adjuvant chemotherapy. Only one patient had neoadjuvant chemotherapy alone.

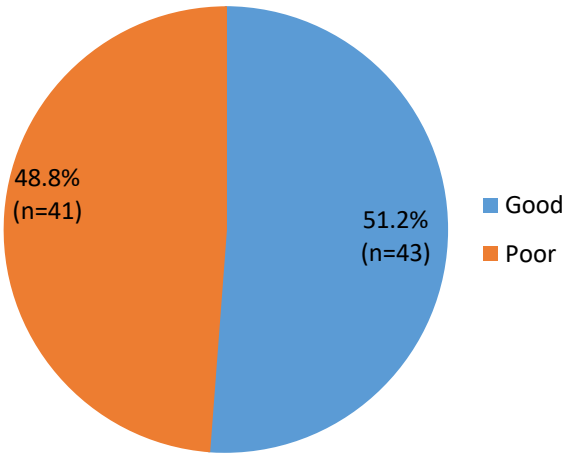

Figure 1: Distribution of treatment outcomes categorized into good and poor among the study population

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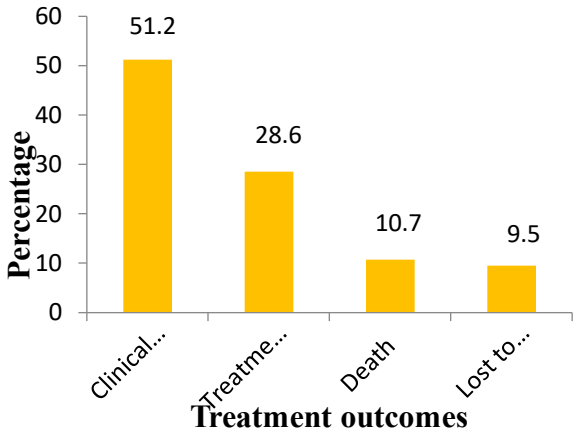

Figure 2: Distribution of treatment outcomes among the study population

Figure 2 shows that 51.2% of patients showed clinical improvement. This was defined as reduction in tumour burden and pain as well as improvement of appetite and general affect.
28.6% of patients involved in the study suffered complications of treatment as outlined in Table 3 below.

Table 3-Complications associated with surgery and chemotherapy.

Treatment Modality	Associated complications	Frequency	Percentage
Surgery	Arm Lymphoedema	02	2.4
	Seroma	04	4.8
	Flap necrosis	01	1.20
Chemotherapy	Anaemia	10	12.0
	Agranulocytosis presenting as fever	02	2.4
	Thrombocytopenia	03	3.6

7 patients suffered post-surgical complications while 15 had complications arising from chemotherapy. In addition, some patients had a combination of complications from surgery and chemotherapy (seroma + anaemia, lymphoedema + anaemia)

Table 4: Relationship between some characteristics and treatment outcome.

Variables	Treatment Outcome		Total
	Good	Poor	
	n (%)	n (%)	n (%)
Age (years)			
<50 years	25 (48.1)	27 (51.9)	52 (100.0)
≥50 years	18 (56.2)	14 (43.8)	32 (100.0)
	Chi-square =0.530; p-value =0.467		
Positive family history of breast cancer			
Yes	10 (47.6)	11 (52.4)	21 (100.0)
No	33 (52.4)	30 (47.6)	63 (100.0)
	Chi-square =0.143; p-value =0.705		
Use of alcohol			
Yes	7 (43.8)	9 (56.2)	16 (100.0)
No	36 (52.9)	32 (47.1)	68 (100.0)
	Chi-square =0.438; p-value =0.508		
Use of tobacco			
Yes	3 (50.0)	3 (50.0)	6 (100.0)
No	40 (51.3)	38 (48.7)	78 (100.0)

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Variables	Treatment Outcome		Total
	Good n (%)	Poor n (%)	n (%)
	Fisher's Exact p-value =1.000		
Duration of symptoms at time of presentation			
≤6 months	21 (65.6)	11 (34.4)	32 (100.0)
>6 months	22 (42.3)	30 (57.7)	52 (100.0)
	*Chi-square =4.311; p-value =0.038**		
Surgery			
Yes	39 (53.4)	34 (46.6)	73 (100.0)
No	4 (36.4)	7 (63.6)	11 (100.0)
	Chi-square =1.114; p-value =0.291		
Chemotherapy			
Yes	38 (70.4)	16 (29.6)	54 (100.0)
No	5 (16.7)	25 (83.3)	30 (100.0)
	*Chi-square =22.261; p-value =0.001**		

*Statistically significant

Table 3 shows 70.4% good outcome with chemotherapy and just 16.7% without chemotherapy (p<0.001). Early presentation (≤6 months) resulted in 65.6% good outcomes as against 42.3% for late presentation (>6 months)-p=0. 038. Apart from these 2 significant factors other indices like family history, age and use of alcohol and tobacco did not contribute significantly to outcome.

Table 5: Logistic regression analysis showing the relationship between treatment outcome (dependent variable) and demographic/clinical characteristics (independent variables)

Variables	Dependent Variable – Treatment outcome				
		Test Statistics	95% CI		
	B	Odds Ratio	Lower	Upper	p-value
Duration of symptoms at time of presentation					
≤ 6 months	1.102	3.01	1.01	9.00	0.049*
> 6 months [R]		1			
Chemotherapy					
Yes	2.547	12.77	3.95	41.25	0.0001*
No [R]		1			

R-Reference category; CI- Confidence Interval *Statistically Significant, Regression model performance: Hosmer-Lemeshow test p= 0.62 (good fit).

Logistic regression analysis depicted in table 5 also supported the findings earlier documented in Table 4 for the influence of chemotherapy and early presentation.

DISCUSSION

The findings in our study showed that chemotherapy is a key factor in determining survival, thus aligning with global evidence.[7] However, only 64.3% of the patients received chemotherapy which is far below the 85-90% rates in high-income countries.[8] Factors mitigating against adequate chemotherapy coverage include cost and access to proper care. On average a full cost of chemotherapy will cost about 1,100 US dollars[9] which is about 1.8 million naira, an amount far beyond the capacity of the average citizen. Some studies have showed that ignorance and cultural beliefs are major contributors to delay in seeking treatment.[10] The 2.6-fold better outcomes with early presentation (≤6 months) underscore the need for community education and evidence from Rwanda shows that mobile clinics and outreaches into the community can reduce delays by 40%.[11] There were some unexpected findings from this study. Firstly, surgery showed no significant benefit (p=0.291). This runs counter to normal trends[12] and

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could be explained by high rates of advanced disease at presentation, as 78.6% of patients presented with palpable lumps. Suboptimal tumour free margins during surgery could also be a factor in the poor contribution of surgery to patient survival. This can be improved by providing oncoplastic surgical training to more surgeons and thus help development of better surgical margin assessment protocols.

It was also noted that age was not a reliable predictor of outcome, unlike Western studies[13] which showed that increased age at first birth and increased age at menopause were associated with increased rate of HR^+ breast cancers. This may reflect Nigeria's younger patient population (mean age 47 years vs 62 years in high income countries).

Recommendations for mitigation of some of the issues identified in this study include expansion of chemotherapy access by subsidizing treatment costs, local production of relevant medications as well as training of more oncologists. Community awareness can be improved by institution of awareness campaigns by governmental and non-governmental organisations. Mobile screening units, which have made a significant impact in other African countries can be introduced to ensure more significant community penetration, especially in rural and low-income areas.[15]

CONCLUSION

This study identifies chemotherapy access and early diagnosis as critical factors in improving breast cancer outcomes in Nigeria. While challenges persist, targeted investments in treatment infrastructure and community education could significantly narrow survival disparities.

Declarations

Conflict of Interest Declaration: The authors declare there are no conflicts of interest.

Ethical Conformity Statement: Ethical approval for this study was obtained from the Research Ethics Committee of the Federal Medical Centre Yenagoa (Approval Reference No FMCY/REC/045/2025). The study was conducted in accordance with the ethical standards of the Helsinki Declaration of 1975, as revised in 2000. As this was a retrospective study involving review of existing clinical records with no direct patient intervention, the Ethics Committee granted a waiver of individual informed consent. All patient data were anonymised prior to analysis, and no identifying information is presented in this report.

Acknowledgement: The authors acknowledge the kind support of the Departments of Surgery of the Federal Medical Centre Yenagoa and the Bayelsa Medical University Yenagoa.

REFERENCES

1. Joko-Fru WY, Miranda-Filho A, Soerjomataram I, Egue M, Akele-Akpo MT et al Breast cancer survival in sub-Saharan Africa by age, stage at diagnosis and human development index: A population-based registry study. Int J Cancer. 2020 146(5):1208-1218. doi: 10.1002/ijc.32406.
2. Atoyebi SB, Awodutire PO, Igbalajobi MM, Anifowose OO. Survival times of breast cancer patients in Nigeria. Asian J Immunol. 2023;6(1):209-23.
3. Jedy-Agba E, McCormack V, Olaomi O, Badejo W, Yilkudi et al Determinants of stage at diagnosis of breast cancer in Nigerian women: sociodemographic, breast cancer awareness, health care access and clinical factors. Cancer Causes Control. 2017 28(7):685-697. doi: 10.1007/s10552-017-0894-y.
4. Olaogun JG, Agodirin OS, Idowu DB. Patient delay in initiating treatment after breast cancer diagnosis: A cause for concern. J Health Sci Res. 2024; 9:55-9. doi: 10.25259/JHSR_48_2023
5. Olayide AS, Halimat AJ, Samuel OA, Ganiyu RA, Soliu OA. Level of awareness and knowledge of breast cancer in Nigeria. A systematic review. Ethiop J Health Sci. 2017 Mar 15;27(2):163-74. doi: 10.4314/ejhs.v27i2.9.
6. Adeniji AA, Dawodu OO, Habeebu MY, Oyekan AO, Bashir MA et al. Distribution of Breast Cancer Subtypes Among Nigerian Women and Correlation to the Risk Factors and Clinicopathological Characteristics. World J Oncol. 2020 Aug;11(4):165-172. doi: 10.14740/wjon1303.
7. Ginsburg O, Yip CH, Brooks A, Cabanes A, Caleffi M et al. Breast cancer early detection: A phased approach to implementation. Cancer. 2020 May 15;126 Suppl 10(Suppl 10):2379-2393. doi: 10.1002/cncr.32887.
8. Cardoso F, Kyriakides S, Ohno S, Penault-Llorca F, Poortmans P, Rubio IT, et al. Early breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2019 Aug 1;30(8):1194-1220. doi: 10.1093/annonc/mdz173.
9. Saldaña-Téllez M, Meneses-Navarro S, Cano-Garduño L, Unger-Saldaña K. Barriers and facilitators for breast cancer early diagnosis in an indigenous community in Mexico: voices of Otomí

Print ISSN: 0189-9287 Online ISSN: 2992-345X

women. BMC Womens Health. 2024 Jan 13;24(1):33. doi: 10.1186/s12905-023-02875-2.
10. George TO, Allo TA, Amoo EO, Olonade O. Knowledge and Attitudes about Breast Cancer among Women: A Wake-Up Call in Nigeria. Open Access Maced J Med Sci. 2019 May 25;7(10):1700-1705. doi: 10.3889/oamjms.2019.221.
11. Uwimana A, Dessalegn S, Vianney Dusengimana JM, Stauber C, Fata A, Hagenimana M et al. Integrating breast cancer early detection into a resource-constrained primary health care system: health care workers' experiences in Rwanda. JCO Global Oncol. 2022 Dec;8: e2200181.
12. 12.Riis M. Modern surgical treatment of breast cancer. Annals of medicine and surgery. 2020 Aug 1; 56:95-107.
13. Anderson KN, Schwab RB, Martinez ME. Reproductive risk factors and breast cancer subtypes: a review of the literature. Breast Cancer Res Treat. 2014 Feb;144(1):1-10. doi: 10.1007/s10549-014-2852-7.
14. Folorunso SA, Abiodun OO, Abdus-Salam AA, Wuraola FO. Evaluation of side effects and compliance to chemotherapy in breast cancer patients at a Nigerian tertiary hospital. Ecancermedicalscience. 2023 Apr 21; 17:1537. doi: 10.3332/ecancer.2023.1537.
15. Omisore AD, Olasehinde O, and Wuraola FO, et al (2023) Improving access to breast cancer screening and treatment in Nigeria:the triple mobile assessment and patient navigation model (NCT05321823): a study protocol PLoS One 18(6) e0284341 https://doi.org/10.1371/journal.pone.0284341
16. Azubuike SO, Muirhead C, Hayes L, McNally R. Rising global burden of breast cancer: the case of sub-Saharan Africa (with emphasis on Nigeria) and implications for regional development: a review. World J Surg Oncol. 2018 Dec;16(1):189. doi: 10.1186/s12957-018-1489-x
17. Kantelhardt EJ, Zerche P, Mathewos A, Trocchi P, Addissie A et al. Breast cancer survival in Ethiopia: a cohort study of 1,070 women. Int J Cancer. 2014 Aug 1;135(3):702-9. doi: 10.1002/ijc.28691.
18. Vanderpuye V, Grover S, Hammad N, Prabhakar P, Simonds H, Olopade F, et al. An update on the management of breast cancer in Africa. Infect Agent Cancer. 2017 14; 12:13. doi: 10.1186/s13027-017-0124-y.
19. Ofuya M. Overcoming barriers to early breast cancer presentation in Nigeria. Lancet Oncol. 2024 Jul;25(7):840. doi: 10.1016/S1470-2045(24)00319-X.

Print ISSN: 0189-9287 Online ISSN: 2992-345X