Assessment of Pre-Diagnosis Awareness and Practice of Mammography Screening among Women with Breast Cancer at Medserve-Luth Cancer Centre (MLCC)

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DOI: https://dx.doi.org/10.51244/IJRSI.2025.1215PH000198

Received: 04 November 2025; Accepted: 11 November 2025; Published: 21 November 2025

ABSTRACT

Background: The most common malignancy and leading cancer-related death in women globally is breast cancer, including Sub-Saharan Africa. Over 60% of Nigerian patients present late due to lack of awareness and utilization of mammography screening. This study assessed prediagnosis awareness and practice of mammography screening in breast cancer patients at the MEDSERVE-LUTH Cancer Centre.

Methods: A cross-sectional descriptive study was conducted among 196 breast cancer patients at the MEDSERVE-LUTH Cancer Centre. Structured questionnaires for socio-demographic factors, awareness about mammography, knowledge and practice of BSE, and health-seeking attitudes were employed for data collection. Data analysis was done using SPSS v27, and descriptive statistics was employed.

Results: Participant's mean age was 43.6 ± 10.2 years. Mammography screening awareness before diagnosis was known to only 10.1%, the most common sources being family/friends (3.5%) and social media (4%). Only 2% had undergone mammography before diagnosis, whereas most patients (93.4%) knew BSE. The most common source of discovering the breast lumps was by BSE in 66.2% of patients, and only 8.1% by mammography. Cultural and religious opinions (7.1%), expense (1.5%), and distance (1%) were some of the barriers to the use of mammography. Despite low awareness, 89.4% believed it would have made detection possible earlier, and 97.5% expressed a willingness to persuade others to undergo screening.

Conclusion: Awareness and use of mammography among Nigerian breast cancer patients remain very low, despite the major usage of breast self-examination as the first and only method of detection. There is a need for intervention involving health education, utilization of health professionals, cost control, and increased access to mammography to enhance earlier diagnosis and survival.

Keywords: Breast cancer, Mammography, Awareness, Prediagnosis, Early detection, Nigeria

INTRODUCTION

Breast cancer is the most frequently diagnosed cancer and a primary cause of cancer-related fatalities among women globally, with its impact growing rapidly in sub-Saharan Africa (SSA), where patients often present with more advanced stages of the disease and have worse survival rates compared to high-income regions (1,2). More than a million women are diagnosed with breast cancer each year, leading to approximately 410,000 deaths from the disease (3–5). Some research indicates that breast cancer is the most significant cause of cancer-related deaths

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV October 2025 | Special Issue on Public Health

among women in Nigeria (6). The rising incidence of breast cancer in developing nations is attributed to increased life expectancy, urbanization, and the adoption of Western lifestyle habits (4). There exists considerable variation in breast cancer incidence rates across regions, ranging from 19.3 per 100,000 women in Eastern Africa to 89.7 per 100,000 women in Eastern Europe (4). The late diagnosis and high mortality rates in SSA are partly due to inadequate early detection systems, limited access to screening services for the population, and a lack of awareness regarding screening options like mammography (1,7).

Mammography is the recognized imaging technique for breast cancer screening and has been linked to earlier diagnoses and decreased mortality where organized screening programs are in place. Nonetheless, in many low- and middle-income countries (LMICs), including Nigeria, organized mammography initiatives are few, and the uptake of opportunistic mammography is low due to various obstacles such as lack of awareness, cost, limited equipment availability, shortage of trained staff, and sociocultural factors hindering participation (7,8). Research conducted in Nigeria and other SSA locations consistently identifies a lack of awareness about mammography as a significant barrier, even if geographic access is available, highlighting a crucial gap between availability and utilization (9).

Crucially, the awareness and previous use of mammography among women ultimately diagnosed with breast cancer—who could have benefited from earlier screenings—remains low in several hospital-based studies within SSA. For instance, hospital groups in Ethiopia and similar regions report extremely low levels of prediagnosis awareness and past mammography usage among breast cancer patients, indicating missed chances for early detection within the populations that later present with the disease (10). Furthermore, recent cross-sectional studies and surveys in Nigeria reveal ongoing deficiencies in knowledge, willingness, and practical obstacles regarding mammography among women in both community and clinical contexts (8,11).

Gaining insight into the levels of awareness, information sources, and barriers present before diagnosis among patients attending MEDSERVE-LUTH will aid in identifying missed opportunities for earlier detection and inform targeted interventions, which may include healthcare provider training, community awareness campaigns, and policy initiatives to enhance affordable access to screening. Assessments at the population level suggest that enhancing facility capabilities must be complemented by demand-side initiatives aimed at improving knowledge and acceptance of screening to facilitate earlier diagnosis and better outcomes.

This study seeks to assess the pre-diagnosis awareness and practice of mammography screening among women diagnosed with breast cancer at the MEDSERVE-LUTH, explore the sources of information and understanding about mammography, and identify perceived and structural barriers that hindered prior participation.

METHODOLOGY

Study Area

The study area was the MEDSERVE-LUTH Cancer Centre, which was established in 2019. The MEDSERVE -LUTH Cancer Centre was a specialized cancer treatment centre that offered cutting-edge therapies and a modern approach to cancer care in Africa. Situated within the site of Lagos University Teaching Hospital, it possessed the largest and most experienced oncology team in Nigeria. The treatment centre was equipped with high-quality modern technology, such as linear accelerators, brachytherapy machines, and treatment planning systems. Several treatments were also available at the cancer centre, which included internal and external beam radiation therapy, chemotherapy, and pharmacy treatments.

Study Design

A descriptive cross-sectional study was conducted to assess levels of awareness of mammography screening among breast cancer patients at the MEDSERVE -LUTH Cancer Centre before diagnosis.

Study Population

The study population was conducted among female breast cancer patients at the Department of Clinical and

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV October 2025 | Special Issue on Public Health

Radiation Oncology in the MEDSERVE-LUTH Cancer Centre.

Participants and Eligibility Criteria

Inclusion Criteria

All patients diagnosed with histologically proven breast cancer.

Patients who gave consent and were willing to participate in the study.

Patients receiving treatment at MEDSERVE-LUTH Cancer Centre.

Exclusion Criteria

Male breast cancer patients.

Patients with incomplete medical records regarding their breast cancer diagnosis.

Sample Size

The sample size was determined using Cochrane formula

$n = z^2pq/d^2$

Where;

n = Sample size

z = Standard deviation (1.96 for 95% confidence interval)

p = best estimate of the population prevalence (10% = 0.1)

q = 1-p

d = Tolerable error $(0.05)^2$

$$\frac{1.96^2 \text{ x } 0.1 \text{ x } 1 - 0.1}{0.05^2} = 138.30$$

The addition of 40% attrition rate was 55.32 + 138.30

Sample size = 194

Sampling Technique

A purposive sampling technique was used to select respondents who met the inclusion criteria.

Research Instrument and Procedure for Data Collection

Data were collected with the aid of a structured questionnaire, and information was obtained from the patients. The study questionnaire was based on the research objectives and contained important information about the patients, which included socio-economic and demographic characteristics, awareness of mammography screening. Knowledge and practice of breast self-examination (BSE), diagnosis and treatment seeking behaviors, family history and risk factors, and lifestyle and hormonal factors.

Statistical Analysis

Prior to data analysis, the data were collected with the aid of the questionnaire and manually entered into

Microsoft Excel Office. They were imported into Statistical Package for Social Science (SPSS) version 27 for data analysis. The Kolmogorov–Smirnov test was utilized to check for normally distributed data. Data were presented in frequency, percentage, mean, and standard deviation (SD).

Ethical Consideration

Ethical approval was obtained from the Lagos University Teaching Hospital (LUTH) Human Ethics Research Committee. Informed consent was obtained from all the study participants, ensuring they knew the nature of the study, their rights, and the process involved. Participants had the liberty to take part in and withdraw from the study at any time without consequences. The privacy and confidentiality of the participants were strictly adhered to throughout the study and beyond.

RESULTS

The mean age of the breast cancer patients was 43.63 ± 10.19 years. The largest proportion of patients was within the 30–39 years age group (33.2%), followed by those aged 50–59 years (31.2%) and 40–49 years (24.6%), while only 3% were within the 60–69 years group. Regarding religion, most patients were Christians (62.1%), while 36.9% were Muslims and 0.5% practiced traditional religion. Regarding ethnicity, Yoruba patients constituted the majority (75.8%), followed by Igbo (15.2%), with Hausa (1%) and other ethnic groups (8.1%) making up the remainder. Regarding occupation, most patients were self-employed or engaged in business (42.4%), 39.4% were classified under other forms of occupation, 12.6% were civil servants, and 4.5% were private employees. Educational attainment showed that 46% had secondary education, 36.9% had tertiary education, 13.6% had primary education, and 3% had no formal education. Considering the duration of diagnosis, 68.4% of patients had been diagnosed for less than six months, 24.8% between 7 months and one year, while 5.5% had lived with the diagnosis for more than one year.

Table 1: Socio-economic and Demographic Characteristics of BC Patients

Variables	Frequency	Percentage
Age (43.63 ± 10.19)		
20 – 29 years	15	7.5
30 – 39 years	66	33.2
40 – 49 years	49	24.6
50 – 59 years	62	31.2
60 – 69 years	6	3
Religion		
Christianity	123	62.1
Islam	73	36.9
Traditional worshipper	1	0.5
Ethnicity		
Yoruba	150	75.8
Igbo	30	15.2
Hausa	2	1
Others	16	8.1
Occupation		
Civil Servant	25	12.6

Private Employees	9	4.5
Self-employed/Business	84	42.4
Others	78	39.4
Education Level		
None	6	3
Primary	27	13.6
Secondary	91	46
Tertiary	73	36.9
Duration of diagnosis		
< 6 months	136	68.4
7 months – 1 year	49	24.8
More than 1 year	11	5.5

Only a small proportion of breast cancer patients reported awareness and practice of mammography screening before diagnosis, with 20 patients (10.1%) indicating awareness, while the majority (88.9%) had no prior knowledge. Among those who were aware, the most common sources of information were social media (4%), followed by family and friends (3.5%) and mass media (2%). Despite this awareness, only 4 patients (2%) had undergone mammography screening, while 17 patients (8.6%) did not, citing religious and cultural beliefs (7.1%), cost (1.5%), distance (1%), and other reasons (1%). Of those who had screening, only 1 patient (0.5%) reported doing so one year before diagnosis. Knowledge regarding mammography guidelines was also very low, as only 2 patients (1%) knew the recommended age for screening, with both incorrectly identifying it as 20 years. Furthermore, none of the patients knew how often mammography screening should be carried out, as all respondents (11.1%) reported no knowledge.

Table 2: Awareness and Practice of Mammography Screening of BC Patients

Variables	Frequency	Percentage
Awareness of mammography screening before diagnosis		
Yes	20	10.1
No	176	88.9
If yes, source of awareness		
Family/Friends	7	3.5
Mass media	4	2
Social media	8	4
Mammography screening after awareness		
Yes	4	2
No	17	8.6
If no, reasons for not undergoing mammography screening		
Cost	3	1.5
Distance	2	1
Religious/Cultural beliefs	14	7.1
Others	2	1
If yes, how many years before diagnosis did you undergo mammography screening?		
1 year	1	0.5

Do you know at what age a woman should start mammography screening?		
Yes	2	1
No	20	10.1
If yes, at what age?		
20 yes	2	1
Do you know how often a woman should undergo mammography screening?		
Yes	0	0
No	22	11.1

The majority of breast cancer patients (93.4%) reported knowledge of breast self-examination (BSE), while only 6.6% had no prior awareness. Among those who were aware, the most common source of information was social media (35.4%), followed by hospitals (26.8%), family and friends (12.1%), and religious gatherings (12.1%). Mass media accounted for 6.1% as a source of awareness.

Table 3: Knowledge and Practice of Breast Self-Examination (BSE) of BC Patients

Variables	Frequency	Percentage
Do you know about breast self-examination?		
Yes	185	93.4
No	13	6.6
If yes, what are your source of awareness?		
Family/Friends	24	12.1
Mass media	12	6.1
Religious gathering	24	12.1
Hospital	53	26.8
Social media	70	35.4

Most patients (66.2%) discovered their breast mass through breast self-examination, while 33.8% did not. In addition, 41.4% reported that a relative observed the mass. Clinical detection methods were less common, with 14% identifying the mass through ultrasound scan and 8.1% through mammography. Regarding initial symptoms, the most frequently reported abnormality was a breast lump (57.6%), followed by ulceration or wound (51%), skin changes (35.9%), breast pain (26.8%), swelling in the armpit (24.7%), and nipple discharge (11.6%). In terms of health-seeking behavior, the vast majority of patients (89.4%) consulted a doctor within a few months of noticing abnormal breast changes, while only 9.1% presented within a few weeks, and 1.5% delayed for a few years. Most patients (89.4%) believed regular mammography screening could have facilitated earlier detection, and almost all (97.5%) indicated they would encourage other women to undergo regular mammography screening for early detection of breast cancer. Regarding treatment history, 12.6% of patients had undergone previous surgery, 94.4% had received radiotherapy, and 98.5% had received chemotherapy. Targeted therapy had been administered to 39.4% of patients, immunotherapy to 14.1%, and hormonal therapy to 12.1%.

Table 4: Diagnosis and Treatment Seeking Behaviors of BC Patients

Variables	Frequency	Percentage
How do you discover your breast mass?		
Breast Self-examination		
Yes	131	66.2

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV October 2025 | Special Issue on Public Health

No	67	33.8
Observed by a relative		
Yes	82	41.4
No	116	58.6
USS Scan		
Yes	28	14.
No	170	85.9
Mammography		
Yes	16	8.1
No	182	91.9
What did you first observe?		
Lump		
Yes	114	57.6
No	84	42.4
Skin changes		
Yes	71	35.9
No	127	64.1
Nipple discharge		
Yes	23	11.6
No	175	88.4
Pains in the breast		
Yes	53	26.8
No	145	73.2
Ulceration/Wound		
Yes	101	51
No	96	48.5
Swelling in the armpit		
Yes	49	24.7
No	149	75.3
How soon did you see a doctor after noticing an abnormal breast change?		
Within a few weeks	18	9.1
Within a few months	177	89.4
After a few years	3	1.5
Do you believe regular mammography screening could have helped detect your breast cancer earlier?		
Yes	177	89.4
No	10	5.1

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV October 2025 | Special Issue on Public Health

Not sure	11	5.6
Would you encourage other women to undergo regular mammography screening for early detection of breast cancer?		
Yes	193	97.5
No	3	1.5
Not sure	1	0.5
Have you done surgery previously?		
Yes	25	12.6
No	172	86.9
Have you received radiotherapy previously?		
Yes	187	94.4
No	10	5.1
Have you received chemotherapy previously?		
Yes	195	98.5
No	3	1.5
Have you received targeted therapy previously?		
Yes	78	39.4
No	120	60.6
Have you received immunotherapy previously?		
Yes	28	14.1
No	170	85.9
Have you received hormonal therapy previously?		
Yes	24	12.1
No	174	87.9

Most patients (91.9%) were aware that breast cancer could be hereditary, while 7.6% did not know. A positive family history of cancer was reported in 67.7% of patients, with affected relatives including mothers (25.3%), aunts (21.7%), and sisters (19.7%). Regarding reproductive history, the age of menarche was most commonly 13 years (44.9%), followed by 12 years (30.8%) and 14 years (19.7%), while very few experienced menarche at 11, 15, or 16 years. The majority of patients (96%) had children, with the age at first childbirth most frequently between 21–25 years (49.6%), followed by 26–30 years (32.4%) and 16–20 years (12.6%). Most patients (65.7%) had between 3 and 4 children, while 15.1% each had 1–2 children or 5–6 children. Breastfeeding practices were also common, as 94.9% of patients reported breastfeeding their children. Among them, the majority breastfed for 7 months to 1 year (65.1%), followed by 1–2 years (29.3%), while only 0.5% breastfed for less than 6 months.

Table 5: Family history and Risk factors of BC Patients

Variables	Frequency	Percentage
Do you know that breast cancer can be hereditary?		
Yes	182	91.9
No	15	7.6

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV October 2025 | Special Issue on Public Health

Family history of cancer		
Yes	134	67.7
No	64	32.3
If yes, relationship to the affected relative		
Aunt	43	21.7
Mother	50	25.3
Sister	39	19.7
Others	1	0.5
Age of first menstrual period		
11 years	4	2
12 years	61	30.8
13 years	89	44.9
14 years	39	19.7
15 years	4	2
16 years	1	0.5
Do you have children?		
Yes	190	96
No	8	4
If yes, age of your first child		
16 – 20 years	25	12.6
21 – 25 years	98	49.6
26 – 30 years	64	32.4
31 years and above	4	2
How many children do you have?		
1 – 2	30	15.1
3 – 4	130	65.7
5 – 6	30	15.1
Do you breastfeed your children?		
Yes	188	94.9
No	2	1
If yes, for how long did you breastfeed?		
0 - 6 months	1	0.5
7 months – 1 year	129	65.1
1 - 2 years	58	29.3

More than half of the patients (57.1%) reported a history of oral contraceptive use, while 42.9% had never used them. Among those who had used oral contraceptives, the majority (47.9%) reported use for more than one year, while smaller proportions used them for less than six months (4.5%) or between seven months and one year (4.5%). With respect to menopausal status, 33.8% of patients had stopped menstruating, whereas 65.7% were

still menstruating. Among those who had reached menopause, 13.1% reported cessation before the age of 50 years, while 19.7% stopped menstruating after 50 years.

Table 6: Lifestyle and Hormonal factors of BC Patients

Variables	Frequency	Percentage
Have you used oral contraceptives?		
Yes	113	57.1
No	85	42.9
If yes, for how many years did you use oral contraceptives?		
< 6 months	9	4.5
7 months - 1 year	9	4.5
More than 1 year	95	47.9
Have you stopped menstruating?		
Yes	67	33.8
No	130	65.7
If yes, at what age did you stop?		
< 50 years	26	13.1
> 50 years	39	19.7

DISCUSSION

This study highlights with concern the extremely low prediagnosis awareness and mammography uptake among breast cancer patients in the Lagos University Teaching Hospital. Fewer than a limited percentage of patients were aware of mammography, and fewer still had ever undergone screening before diagnosis, the results mirroring historic patterns in Nigeria and across sub-Saharan Africa (SSA) of late diagnosis of breast cancer and poor survival (2,11). The ability of these findings to remain robust after decades of campaign activity underscores system-wide weaknesses that go beyond practice at the individual level and require structural health system reform.

Our findings concur with several Nigerian studies that have reported mammography awareness and practice rates of 10–25% among hospital and community women (1,8,12). Another study in Ibadan showed that only 12% of women had ever heard of mammography, and fewer than 5% had been screened before diagnosis (9). In a systematic review of existing literature in Sub-Saharan Africa, Omisore et al. (7) indicated that generally, awareness of mammography is low, and the rate of screening never exceeds 10%, except in specific pilot projects or research studies. In contrast, structured screening programs in developed countries have over 60% uptake, resulting in earlier detection and significantly improved survival rates (8). These disparities indicate variations in access to diagnostic resources, health education, and systemic support for cancer prevention.

The finding in our study was that most participants who were aware of mammography had learned it from mass media, social networks, or social media websites, but not from health care providers. Such a pattern has already been recorded in Nigeria, where doctors and nurses are barely cited as sources of first-hand information on breast cancer screening (2,13). Conversely, in high-resource countries, healthcare providers are the most authoritative and efficient supporters of uptake of screening (14,15). This suggests a missed opportunity for Nigerian healthcare providers, especially primary care providers, to integrate cancer education into routine patient care.

Nearly two-thirds of patients in this research had BSE noted as the means by which they identified their breast lump. While BSE has been highly promoted throughout Nigeria because of its ease and low cost, evidence suggests that it is not a suitable substitute for mammography or clinical breast examination (CBE) for early detection and survival rates (16,17). Prioritization of BSE in health campaigns without concurrent investment in mammography can inadvertently promote late detection because women will report only upon discovering palpable lumps that typically indicate advanced disease.

The hindrances found in this research were cost, distance to health centers, cultural and religious views, stigma, and not knowing screening intervals. These are consistent with hindrances reported in other SSA settings (7,13). For instance, cultural myths regarding cancer as well as fatalistic attitudes in Ethiopia and Ghana were key discouragements to screening uptake, with cost and geographic hindrances being similarly salient (10,18). In Nigeria, where out-of-pocket health expenditure prevails, the affordability of mammography is a major challenge for women of low- and middle-income backgrounds (8,9). Additionally, inequities are further worsened by the absence of organized national screening programmes, with access for rural women disproportionately limited to urban tertiary hospitals. Although prediagnosis awareness was low, our study found that most women were willing to persuade others to have mammography if provided with the chance. This means that acceptability of screening is not the primary issue, but the issues are awareness, affordability, and accessibility.

This study provides hospital-based data in women later diagnosed with breast cancer, which indicates a different perspective on prediagnosis knowledge and utilization gaps, and mammography use. The findings from the study are diminished by having a single-center design and cannot be extrapolated to all of Nigeria, especially rural areas, where awareness and availability are likely even poorer.

CONCLUSION

This study showed persistent low prediagnosis awareness and utilization of mammography screening among breast cancer cases in this region. Even when access to the mammography facility is available, only 10.1% of the respondents had ever heard of the screening tool, and only 2% had ever been exposed to mammography before diagnosis. However, breast self-examination was the most widely used lump detection practice, and this points to the lack of organized, system-level approaches to early breast cancer detection in Nigeria. Health policy-makers and stakeholders need to focus on incorporating awareness of mammography into primary health and community programs, subsidize screening expenses, and build health system infrastructure for early detection. In the absence of such directed interventions, Nigerian women will remain exposed to late presentation and compromised survival rates of breast cancer.

Statements and Declarations

This study is an original work and is the fruit of various researchers contributing in various capacities.

Funding

No funds, grants, or other financial support were received in the preparation of this manuscript.

Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

Authors Contribution

All authors contributed to the study's conception and design. Emmanuel Andero and Samson Ezekiel performed material preparation, data collection, and analysis. Andero wrote the first draft of the manuscript, and all other authors commented on previous versions. Everyone read and approved the final manuscript.

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