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Mixed-Methods Analysis of Breast Self-Examination among 300 Women in Ilorin, Nigeria: Logistic Regression Modelling and Thematic Analysis of Screening Practice

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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

Aim: Breast cancer remains the leading malignancy among Nigerian women, with late-stage diagnosis contributing to high mortality rates. Breast self-examination (BSE) is a crucial early detection strategy in resource-limited settings, such as Nigeria, where access to mammography is

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limited. This study assessed the knowledge, attitudes, and practices of BSE among women in Ilorin, Kwara State, to identify barriers and predictors of regular screening.
Study Design: A community-based, cross-sectional mixed-methods study combining quantitative surveys (n=250) with qualitative in-depth interviews (n=50) was conducted.
Place and Duration of Study: The study was conducted in Ilorin Metropolis, Kwara State, Nigeria, between March and May 2025.
Methodology: A multistage random sampling technique selected 250 women for quantitative surveys, while purposive sampling recruited 50 participants for qualitative interviews. Data were collected using structured questionnaires and interview guides, focusing on socio-demographic factors, BSE knowledge, attitudes, practices, and barriers. Quantitative data were analysed using SPSS version 25, while thematic analysis was applied to qualitative transcripts.
Results: Only 34.0% of participants correctly defined BSE, and 18.8% practised it monthly. Tertiary education (OR: 2.45, p = 0.004) and contact with health workers (OR: 2.12, p = 0.012) significantly predicted regular BSE. While 68.4% of participants recognised a painless lump as a potential symptom, 18.8% of them performed BSE monthly, with forgetfulness (36.8%) and lack of knowledge (45.6%) cited as major barriers. Qualitative insights highlighted structural challenges such as lack of privacy and limited access to healthcare professionals; and also cultural misconceptions, forgetfulness, and lack of privacy as key barriers.
Conclusion: Despite moderate awareness, BSE practice remains low among the 300 women studied in Ilorin due to cultural, educational, and structural barriers. Interventions should prioritise community health worker training, low-literacy education tools, and culturally sensitive campaigns to improve early detection.

Keywords: Breast self-examination; breast cancer, early detection; Nigeria; health literacy; community health workers; cultural barriers.

1. INTRODUCTION

Breast cancer remains a formidable global health challenge, disproportionately affecting women in low- and middle-income countries (LMICs), where late-stage diagnosis and limited healthcare infrastructure contribute to poor survival rates (Afaya et al., 2022). In Nigeria, breast cancer is the most common malignancy among women, accounting for approximately 22.7% of all cancer cases and 18.9% of cancer-related deaths (Fatiregun et al., 2021; Agodirin et al., 2023). Despite advances in screening and treatment modalities in high-income countries, Nigeria continues to grapple with low awareness, cultural barriers, and systemic inefficiencies that hinder early detection and effective management (Ezebuiro et al., 2024). The absence of a structured national screening programme compounds the burden, leaving breast self-examination (BSE) as one of the few viable strategies for early detection in resource-constrained settings (Johnson, 2019).

The global discourse on breast cancer screening has long emphasised mammography and clinical breast examination (CBE) as gold standards, yet these remain largely inaccessible to most Nigerian women (Olasehinde et al., 2019). While high-income nations report significant reductions in mortality due to routine mammographic screening, Nigeria faces a starkly different reality, where fewer than 5% of women have ever undergone mammography (Eseigbe et al., 2024). The prohibitive cost, scarcity of functional mammography machines, and geographical barriers further limit its feasibility (Légaré et al., 2018). Consequently, BSE emerges as a pragmatic alternative, requiring no specialised equipment and empowering women to take an active role in their health (Kruk et al., 2018). However, the effectiveness of BSE hinges on adequate knowledge, positive attitudes, and consistent practice, factors that remain suboptimal in Nigeria (Oboli et al., 2025; Ogunmodede et al., 2022).

Existing research on breast cancer awareness in Nigeria paints a troubling picture of inadequate knowledge and poor screening practices among women. A 2023 population-based study conducted in Ogun State assessed the level of breast self-examination (BSE) awareness and practice among women of reproductive age. The findings revealed that only 31.2% of respondents could accurately describe the correct procedure for BSE, indicating a significant knowledge gap. Even more concerning was the finding that just 14.8% of women performed BSE on a monthly basis as recommended by global health

guidelines (Olayinka et al., 2022). This low adherence to regular self-examination suggests that most women in the region remain vulnerable to late-stage breast cancer detection, which carries far worse prognosis and survival outcomes. The situation is further complicated by deep-rooted sociocultural factors that influence health-seeking behaviours. Research conducted in South Africa, which shares similar cultural dynamics with many Nigerian communities, demonstrated how traditional beliefs shape perceptions of breast cancer (Malope et al., 2024). Many women in the study attributed breast lumps and other abnormalities to supernatural causes such as witchcraft or divine punishment rather than recognising them as potential medical issues requiring professional attention. This mindset frequently leads to delays in seeking proper diagnosis and treatment, as women may first consult spiritual healers or rely on herbal remedies before considering hospital care. Such delays contribute to the high proportion of advanced-stage breast cancer cases seen in clinical settings across sub-Saharan Africa. These findings underscore a critical public health challenge that extends beyond mere knowledge dissemination. While educational campaigns on breast cancer symptoms and screening methods remain necessary, they alone cannot overcome the cultural barriers that prevent women from taking proactive steps. There is an urgent need for interventions that are carefully designed to resonate with local belief systems while still promoting evidence-based medical practices. Community engagement strategies must involve trusted figures such as religious leaders, traditional birth attendants, and female elders who can help bridge the gap between modern medicine and cultural perceptions of illness.

Education plays a significant role in shaping breast cancer screening behaviours. Evidence suggests that women with higher educational attainment are more likely to recognise symptoms and engage in preventive practices (Tavakoli et al., 2024; Damiani et al., 2015). However, Nigeria's literacy rate stands at 62%, with significant regional disparities, further complicating public health messaging (Mangvwat & Meshak, 2022; Olabanji, 2023). Community-based health education programmes have shown promise in improving BSE uptake, yet their scalability remains constrained by funding and logistical challenges (Chan et al., 2007). Furthermore, misinformation propagated through social media and informal networks often undermines formal health promotion efforts (Kbaier et al., 2024; Suarez-Lledo and Alvarez-Galvez 2021). The Nigerian healthcare system's structural weaknesses further compound the problem. A 2024 assessment of primary healthcare centres (PHCs) revealed that fewer than 20% were equipped to provide basic breast cancer education, let alone clinical screening (National Institute for Cancer Research and Treatment, 2023). The shortage of trained healthcare professionals, particularly in rural areas, means that even when women detect abnormalities, access to diagnostic confirmation and treatment is severely delayed (Getachew et al., 2020). This systemic failure perpetuates a cycle of late-stage presentations, where over 70% of breast cancer cases in Nigeria are diagnosed at advanced stages (III or IV), and drastically reducing survival prospects (Agodirin et al., 2025). Given these challenges, there is an urgent need for innovative, culturally adapted strategies to enhance BSE practice in Nigeria. Previous interventions, such as church- and mosque-based health talks, have demonstrated moderate success but require further refinement to ensure sustained impact (Padela et al., 2018; Abu-Ras et al., 2024). Mobile health (mHealth) technologies, including SMS reminders and educational apps, present a viable solution, particularly for younger, tech-savvy populations (Mccool et al., 2022). However, their effectiveness in older and rural demographics remains understudied.

This study thereby intends to critically examine the knowledge, attitudes, and practices of Nigerian women in Ilorin, Kwara State, Nigeria regarding BSE, identifying key predictors of adherence and barriers to uptake. By situating findings within the broader context of Nigeria's healthcare limitations and sociocultural dynamics, this research aims to inform targeted interventions that can bridge existing gaps. The findings will contribute to ongoing policy discussions on integrating BSE education into existing maternal and reproductive health programmes, ensuring wider reach and sustainability.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This study employed a community-based, cross-sectional design to assess the knowledge, attitudes, and practices (KAP) of breast self-examination (BSE) among women in Ilorin,

Kwara State, Nigeria. The selection of a cross-sectional approach was appropriate for capturing a snapshot of BSE awareness at a specific point in time, allowing for the identification of associations between demographic factors and screening behaviours (Wang & Cheng, 2020). Ilorin was chosen as the study location due to its urban and semi-urban mix, providing a representative sample of women with varying socioeconomic and educational backgrounds. The city's healthcare infrastructure, which includes both tertiary and primary health facilities, also offered a suitable setting for evaluating how healthcare access influences BSE practices. Data collection took place between March and May 2025 across selected communities, ensuring seasonal consistency in responses.

2.2 Study Population and Sampling Strategy

2.2.1 Study population

The target population consisted of women aged 18 years and above residing in Ilorin, Kwara State. This age group was selected because breast cancer risk increases from early adulthood, and BSE is recommended for women from the age of 20 (Memon et al., 2015; Qaseem et al., 2019; Cathcart-Rake et al., 2021). The inclusion criteria required participants to be female, permanent residents of Ilorin, and willing to provide informed consent. Exclusion criteria included women with a previous breast cancer diagnosis, those who were critically ill at the time of data collection, and non-residents who were temporarily visiting the area.

2.2.2 Sampling strategy

This study employed a mixed-methods sampling approach to comprehensively evaluate breast self-examination awareness among women in Ilorin. The quantitative component involved 250 participants selected through a multistage random sampling technique, while the qualitative arm included 50 purposively selected respondents for in-depth interviews. This dual approach allowed for both broad generalizability and deep understanding of cultural and behavioural factors influencing BSE practices.

For quantitative sampling, the study first stratified Ilorin into its three main local government areas (Ilorin East, Ilorin West, and Ilorin South) to ensure geographical representation. Within each LGA, five communities were randomly selected using the state's ward register. Household enumeration was conducted in selected communities, with every fourth household visited to identify eligible women aged 18 years and above. When multiple eligible women were present in a household, simple random selection was performed using a lottery method to prevent selection bias (Makwana et al., 2023; Tashakkori & Teddlie, 1998). This systematic approach helped achieve a sample that reflected the city's demographic distribution across age, education, and socioeconomic status.

The qualitative component employed purposive sampling to select 50 information-rich participants from the quantitative sample. Selection criteria focused on maximising variation across key demographic characteristics, including age (18-25, 26-35, 36-45, 46+ years), educational attainment (none, primary, secondary, tertiary), and marital status. Particular attention was given to including women who reported both regular and irregular BSE practices to capture diverse perspectives. Community health workers assisted in identifying potential interviewees who met these criteria and were willing to participate in detailed discussions. In-depth interviews were conducted until thematic saturation was achieved, where no new substantive information emerged from subsequent interviews (4). The interview guide explored personal experiences with BSE, perceived barriers, cultural beliefs, and suggestions for improving awareness. All interviews were conducted in participants' preferred language (Yoruba or English) by trained female researchers in private settings to ensure comfort and confidentiality.

This mixed-methods sampling strategy provided methodological rigour by combining the statistical power of quantitative data with the contextual depth of qualitative insights. The approach was particularly suited to examining health behaviours like BSE that are influenced by both individual knowledge and sociocultural factors (Tashakkori & Teddlie, 1998). The sample sizes for both components were determined based on established guidelines for mixed-methods research in public health studies.

2.3 Data Collection Instrument and Procedures

The study employed a mixed-methods approach to comprehensively assess breast self-examination (BSE) awareness among women in

Ilorin. Quantitative data were gathered using a structured questionnaire, while qualitative insights were obtained through in-depth interviews (IDIs) with key informants. This dual approach ensured a robust examination of both statistical trends and underlying behavioural motivations.

2.3.1 Structured questionnaire

A validated, interviewer-administered questionnaire was adapted from previous studies on breast cancer screening in sub-Saharan Africa. The tool consisted of four sections:

1. Sociodemographic characteristics: Age, marital status, education level, occupation, and household income were recorded to assess socioeconomic influences on BSE awareness.
2. Knowledge assessment: Questions evaluated awareness of BSE, correct techniques, recommended frequency, and knowledge of breast cancer warning signs. Responses were scored, with higher values indicating better knowledge.
3. Attitude evaluation: Likert-scale items measured perceptions of BSE usefulness, confidence in performing it, and perceived barriers.
4. Practice assessment: Participants reported whether they performed BSE, how often, and reasons for non-compliance.

The questionnaire was pretested among 30 women in Offa, a neighbouring town with similar sociocultural characteristics to Ilorin. Adjustments were made to ambiguous questions to improve clarity. Internal consistency was confirmed using Cronbach's alpha ($\alpha = 0.79$ for knowledge items, $\alpha = 0.74$ for attitude scales), indicating good reliability.

2.3.2 In-depth interviews (Qualitative component)

To complement the quantitative findings, in-depth interviews were conducted with purposively selected participants, including:

1. Women with varying levels of BSE practice (regular, occasional, never)
2. Community health workers
3. Traditional birth attendants
4. Local healthcare providers
5. An interview guide was developed, focusing on:
   a) Cultural beliefs influencing BSE practice
   b) Personal experiences with breast health awareness
   c) Perceived barriers to regular self-examination

Each interview lasted 30-45 minutes, was audio-recorded with consent, and later transcribed verbatim. Field notes captured nonverbal cues and contextual observations.

2.3.3 Data collection procedures

Six trained female research assistants with backgrounds in public health and nursing conducted the fieldwork. Training covered ethical considerations, proper questionnaire administration, and interview techniques to minimise bias.

1. Quantitative data collection: Research assistants visited selected households, explained the study objectives, and obtained written consent before administering the questionnaire. Interviews were conducted in Yoruba or English, depending on participant preference.
2. Qualitative data collection: IDIs were held in private settings (homes, health centres) to ensure confidentiality. Open-ended questions encouraged detailed responses, and probes were used to explore emerging themes.

2.4 Method of Data Analysis

The study employed a rigorous analytical approach to examine both quantitative and qualitative data, ensuring a comprehensive interpretation of findings. Quantitative data from the structured questionnaires underwent multiple stages of statistical processing. The Statistical Package for Social Sciences (SPSS) version 25 facilitated all numerical analyses. Descriptive statistics, including frequencies and percentages, were computed for all variables to summarise the distribution of responses. The logistic regression was used to identify key predictors that were significantly associated with regular breast self-examination practice among the study participants.

Qualitative data from in-depth interviews underwent systematic thematic analysis following the framework method. Audio recordings were transcribed verbatim in the original language before translation to English, where necessary.

Transcripts were repeatedly reviewed to ensure accuracy. Analytical memos documented emerging patterns and relationships between themes. Constant comparison techniques ensured themes remained grounded in the data.

3. RESULTS

3.1 Quantitative Findings

The study surveyed 250 women across Ilorin metropolis to assess their knowledge, attitudes, and practices regarding breast self-examination (BSE). Table 1 presents the socio-demographic characteristics of respondents. The sample represented diverse age groups, educational backgrounds and marital statuses, providing a comprehensive profile of the target population. It was revealed that most respondents (34.0%) fell within the 36-45 age bracket, representing the demographic most vulnerable to breast cancer. Educational attainment was relatively high, with 42.0% possessing tertiary education, though 21.2% had only primary education or less. Married women constituted the majority (61.6%), reflecting the typical marital distribution in the study area. Finally, it was revealed that traders constituted the largest occupational group (39.6%).

The findings presented in Table 2 reveal significant gaps in women's understanding of breast self-examination and breast cancer symptoms in Ilorin. While 59.2% of respondents reported having heard of BSE, only 34.0% could accurately define what the procedure entails. The data further show that 41.6% of participants knew the recommended monthly frequency for performing BSE, indicating that more than half of the women surveyed were either misinformed or unaware of this crucial aspect of breast cancer prevention. This finding is particularly concerning because irregular or infrequent self-examination reduces the likelihood of early cancer detection, which is the primary benefit of BSE.

Regarding symptom recognition, the results demonstrate varying levels of awareness about warning signs of breast cancer. While a majority (68.4%) correctly identified a painless lump as a potential symptom, less than half (42.8%) recognised nipple discharge as concerning. Even fewer women (24.8%) were aware that skin dimpling could indicate breast cancer. This pattern suggests that public health messages about breast cancer symptoms may be overly focused on lumps while neglecting other important warning signs.

Table 3 revealed significant gaps between awareness and actual practice of breast self-examination among participants. Only 47 women (18.8%) reported performing BSE monthly as recommended, while a substantial majority (136 women, 54.4%) admitted to never having practised BSE at all. Among those who practised occasionally (67 women, 26.8%), irregular timing suggests inconsistent adherence to screening guidelines.

Table 1. Socio-demographic characteristics of respondents

Age	**Frequency**	**Percentage (%)**
18-25 years	42	16.8
26-35 years	78	31.2
36-45 years	85	34.0
> 45 years	45	18.0
Educational level		
No formal education	18	7.2
Primary	35	14.0
Secondary	92	36.8
Tertiary	105	42.0
Marital Status		
Single	68	27.2
Married	154	61.6
Divorced/Widowed	28	11.2
Single	68	27.2
Occupation		
Trader	99	39.6
Civil Servant	45	18.0
Artisans	38	15.2
Unemployed	68	27.2

The barrier analysis presents multiple factors contributing to low BSE uptake. Nearly half of the respondents (114 women, 45.6%) cited lack of knowledge as their primary obstacle, indicating deficiencies in community health education. Forgetfulness emerged as the second most common challenge (92 women, 36.8%), pointing to the need for reminder systems or structured screening schedules. A notable proportion (70 women, 28.0%) reported fear of detecting abnormalities as their reason for avoidance, reflecting underlying anxieties about breast cancer diagnosis that may require psychological support components in intervention programs.

Table 4 revealed the logistic regression analysis, which identified key predictors of regular breast self-examination (BSE) practice among women in Ilorin. Education level demonstrated a strong dose-response relationship with BSE adherence. Women with tertiary education were 2.45 times more likely to perform BSE regularly compared to those with primary education or less (95% CI: 1.32-4.56, P = 0.004). Similarly, secondary education showed a significant association, with 1.68 times higher odds of regular practice (95% CI: 1.02-2.76, P = 0.041). These findings align with the earlier descriptive results showing knowledge gaps among less-educated participants.

Table 2. Knowledge of BSE and breast cancer symptoms

Statements	Response	Frequency (n)	Percentage (%)
Have you heard of BSE?	Yes	148	59.2
	No	102	40.8
Do you know the correct definition of BSE?	Yes	85	34.0
	No	165	66.0
Know BSE frequency?	Monthly	104	41.6
	Incorrect/Don't know	146	58.4
Recognised symptoms:	Painless lump	171	68.4
	Nipple discharge	107	42.8
	Skin dimpling	62	24.8

Table 3. BSE practice and reported barriers

Variable	Category	Frequency (n)	Percentage (%)
BSE Practice	Regular (monthly)	47	18.8
	Occasional	67	26.8
	Never	136	54.4
Barriers (multiple responses)	Forgetfulness	92	36.8
	Fear of findings	70	28.0
	Lack of knowledge	114	45.6

Table 4. Predictors of regular breast self-examination practice

Variable	Category	Adjusted OR	95% CI	*P-value*
Education				
Primary or less	(Reference)	1.00	-	-
Secondary		1.68	1.02-2.76	0.041
Tertiary		2.45	1.32-4.56	0.004
Age Group				
18-25 years	(Reference)	1.00	-	-
26-35 years		1.32	0.87-2.01	0.189
36-45 years		1.89	1.05-3.41	0.034
Family Health Worker Contact	Yes vs No	2.12	1.18-3.81	0.012
Marital Status	Married vs Single	1.62	0.92-2.85	0.094
Model fit statistics:				
Hosmer-Lemeshow $\chi^2 = 4.32$ ($p = 0.827$)				
Nagelkerke $R^2 = 0.28$				

Age exhibited a non-linear association with BSE practice. Women aged 36-45 years had 1.89 times higher odds of regular BSE compared to the youngest cohort (18-25 years) (95% CI: 1.05-3.41, *P* = 0.034). This may reflect increased health consciousness in middle adulthood. No significant difference emerged between the 26-35 and 18-25 age groups (OR: 1.32, *P* = 0.189).

Contact with family health workers more than doubled the odds of regular BSE (OR: 2.12, 95% CI: 1.18-3.81, *P* = 0.012), underscoring the importance of community health outreach. Marital status showed a marginal positive association (married women: OR: 1.62, *P* = 0.094), though this did not reach statistical significance. The model showed good fit (Hosmer-Lemeshow *P* = 0.827) and explained 28% of variance in BSE practice (Nagelkerke R^2 = 0.28), suggesting additional unmeasured factors influence screening behaviour.

3.2 Qualitative Findings

The qualitative component of this study involved in-depth interviews with 50 women selected purposively to capture diverse perspectives on breast self-examination (BSE). Thematic analysis of the transcripts revealed three major themes that shape BSE practices in Ilorin: (i) Cultural beliefs and misconceptions, (ii) Structural and logistical barriers, and (iii) Sources of health information. These themes provide context to the quantitative findings and highlight why knowledge often fails to translate into practice.

3.2.1 Theme 1: Cultural beliefs and misconceptions

Many participants held deep-seated cultural beliefs that discouraged proactive breast health monitoring. Several women associated breast abnormalities with supernatural causes, such as witchcraft or divine punishment. One 36-year-old trader stated:

"*When my neighbour found a lump, she went to her pastor first. She believed someone had cursed her. By the time she went to the hospital, it was too late*."

Others viewed BSE as unnecessary for asymptomatic women, with a 36-year-old hair stylist remarking:

"*Why should I check myself when nothing is hurting me? It's like inviting trouble*."

These narratives reveal how cultural narratives foster complacency and delay early detection efforts.

3.2.2 Theme 2: Structural and logistical barriers

Participants identified practical challenges that hindered regular BSE practice. Forgetfulness was common, especially among women with caregiving responsibilities. A 29-year-old mother of four explained:

"*Between cooking, cleaning, and the children, I hardly remember to check. Even if I do, there's no private space in our one-room apartment."*

Limited access to healthcare professionals compounded these issues. A 47-year-old widow shared:

"*The nurse at the primary health centre told me to do BSE, but she didn't show me how. I tried once but wasn't sure if I did it right*."

Such accounts highlight the need for hands-on demonstrations and reminder systems.

3.2.3 Theme 3: Sources of health information

Women's understanding of BSE largely depended on their information channels. Those who received guidance from healthcare workers demonstrated better technique, while others relied on unreliable sources. A 24-year-old university student said:

"*I learned about BSE on Instagram, but the video didn't explain how often to do it. Later, a nursing student friend of mine corrected me*."

Community health workers emerged as trusted figures. A 55-year-old respondent noted:

"*The woman who vaccinates children in our area taught us using a plastic breast model. Now, even my daughters check themselves."*

This theme highlights the role of accurate, localised health education.

These findings contextualise the low BSE rates observed quantitatively and suggest that interventions must address cultural, environmental, and educational factors simultaneously. Community health workers are important in bridging these gaps, as evidenced

by their positive influence on participants who received direct training.

4. DISCUSSION

The findings of this study reveal critical insights into breast self-examination (BSE) awareness among women in Ilorin, Kwara State. The results align with existing literature while highlighting context-specific barriers that must be addressed to improve early detection of breast cancer in Nigeria. The discussion integrates quantitative and qualitative findings to propose actionable recommendations for policymakers and healthcare providers.

The study confirmed a persistent gap between knowledge and practice of BSE, consistent with prior research in Nigeria (Maitanmi et al., 2023). While 59.2% of women had heard of BSE, only 34.0% could define it correctly, and a mere 18.8% practised it monthly. This disparity mirrors findings from similar studies in Enugu State, where awareness rarely translates to action (Abugu et al., 2023). The qualitative data shed light on this gap, revealing that cultural beliefs and structural barriers often override knowledge. For example, women who feared detecting abnormalities or attributed lumps to supernatural causes avoided BSE entirely, despite knowing its importance. This suggests that educational campaigns must move beyond mere information dissemination to address deep-rooted misconceptions. In addition, education emerged as the strongest predictor of regular BSE practice, corroborating evidence from other low-resource settings. Women with tertiary education were 2.45 times more likely to perform BSE than those with primary education or less. This aligns with global data linking higher education to better health literacy and proactive screening behaviours (Park et al., 2018; You & Ahn, 2025; Raghupathi & Raghupathi, 2020; Alabi et al., 2020). However, Nigeria's literacy rate of 62% means nearly half of the women may lack the foundational skills to comprehend BSE guidelines. The qualitative interviews reinforced this; participants with limited education often misunderstood techniques or frequencies, relying instead on informal sources like social media. Targeted interventions should prioritise low-literacy populations, using visual aids and local languages to bridge this gap.

Furthermore, contact with family health workers doubled the odds of regular BSE (OR: 2.12, P = 0.012), highlighting their significant role in grassroots health promotion. Qualitative respondents who received hands-on training from community health workers demonstrated better technique and adherence. This finding supports the Nigerian National Cancer Control Plan's emphasis on task-shifting to community-based providers (Okoroafor & Christmals, 2023). Scaling up programs like the WHO's PEN-Plus strategy, which trains frontline workers in non-communicable disease prevention (Adler et al., 2024; World Health Organization, 2023), could significantly improve BSE uptake in Ilorin and similar settings. Thematic analysis further identified cultural resistance and logistical challenges as major impediments to BSE. Many women avoided screening due to fatalistic beliefs or fear of diagnosis, consistent with studies in Cameroon (Moukam et al., 2021). Structural issues like overcrowded living spaces and forgetfulness further hindered practice. These barriers are not unique to Nigeria but are compounded by the country's healthcare system weaknesses. Interventions must address these systemic gaps by integrating BSE training into routine maternal health services and leveraging mobile health reminders to combat forgetfulness.

5. CONCLUSION

This study demonstrates that while awareness of breast self-examination (BSE) exists among women in Ilorin, significant gaps persist in knowledge translation to regular practice. Only 18.8% of respondents performed BSE monthly, with educational attainment emerging as the strongest predictor of adherence. The qualitative findings reveal that cultural beliefs, fear of diagnosis, and structural barriers like limited privacy and forgetfulness further hinder BSE uptake. Importantly, contact with community health workers doubled the likelihood of regular practice, highlighting their potential as change agents in breast cancer prevention efforts.

These findings highlight the need for targeted, culturally sensitive interventions that address both knowledge gaps and systemic challenges. Integrating BSE education into existing community health programs, leveraging trusted local leaders, and developing low-literacy educational materials could improve early detection rates. Given Nigeria's constrained healthcare resources, scaling up such community-based approaches represents a cost-effective strategy to reduce breast cancer mortality. Future research should explore the long-term impact of these interventions on screening behaviours and stage-at-diagnosis patterns in similar low-resource settings.

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 the writing or editing of this manuscript.

ETHICAL APPROVAL AND CONSENT

The study strictly adhered to the ethical principles, ensuring that all participants were treated with respect and dignity. Participation was entirely voluntary, with no coercion or incentives that could unduly influence consent. Each participant received a detailed explanation of the study's purpose, procedures, potential benefits, and risks in either English or Yoruba, depending on their preference. Written informed consent was obtained from all respondents, while those unable to read or write provided thumbprint consent in the presence of an impartial witness. Participants were explicitly informed of their right to withdraw from the study at any point without facing penalties or consequences. Given the sensitive nature of breast health discussions, trained research assistants monitored participants for signs of distress during interviews.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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