Knowledge and Practice of Breast Cancer Screening Methods Among Women in Oye Ekiti, Ekiti State, Nigeria

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Abstract

Early detection through appropriate screening methods is essential to improve outcomes for breast cancer, a major public health problem. The study was conducted to assess the knowledge and practice of breast cancer screening methods among women in Oye Ekiti, Ekiti State, Nigeria. A cross-sectional survey design was employed and convenience sampling technique was used in the recruitment of 385 women aged 18 years and above in Oye Ekiti. The sample size was calculated using the Cochran formula for an unknown population at the 95% confidence level. Data were collected using a structured questionnaire that assessed knowledge of breast cancer screening methods (breast self-examination, clinical breast examination and mammography), related diagnostic procedures (breast ultrasound, magnetic resonance imaging and breast biopsy) as well as utilisation of these methods. The data obtained were analysed by IBM SPSS. Descriptive statistics (frequencies and percentages) were used in summarising demographic characteristics and level of knowledge and practice. Pearson Chi-square test was used to test the association between variables and binary logistic regression was used to identify predictors of practice at 5% level of significance (p 0.05).

The results revealed that 69.9% of the respondents were aware of at least one method of breast cancer screening. It was also found that 59.7% of them were aware specifically of breast self-examination. In total, 63.1% of the respondents practiced at least one breast cancer screening method and 56.9% practiced breast self-examination regularly. Knowledge and practice of breast cancer screening was significantly associated with educational status, employment status, religion, income level and overall knowledge of screening methods (p 0.05).

The findings point to the necessity of targeted interventions to enhance awareness, knowledge and uptake of recommended methods for breast cancer screening. Community-based health education programmes, improved access to screening services and integration of breast cancer screening into primary healthcare could help to address the gaps identified in this study.

Overcoming these barriers may help improve breast cancer outcomes and facilitate earlier detection in this population.

Keywords: *Breast cancer, Breast cancer screening, Breast self-examination, Mammography, Women's health*

Introduction

Breast cancer is the most common cancer among women worldwide, with more than 2.3 million new cases diagnosed in 2020 alone (Mascara & Constantinou, 2021). In Nigeria, breast cancer is responsible for more than 20% of cancer deaths and is the leading cause of cancer death among women (Mascara & Constantinou, 2021). Several breast cancer screening methods are available, but little is known about the knowledge level of these methods and their utilisation among women in Oye Ekiti, Nigeria.

Early diagnosis is important for effective management of breast cancer. Screening techniques include breast self-examination, clinical breast examination and mammography. Ultrasound, magnetic resonance imaging (MRI) and biopsy are diagnostic procedures that are typically used to further investigate an abnormal screening finding and are not used for routine screening at the population level. Nevertheless, knowledge and use of these methods, both screening and diagnostic, still remains generally low among women in low resource setting, such as Nigeria. Abayomi et al. (2022) revealed that knowledge of breast cancer screening among Nigerian women is still relatively low, with only 20% of Nigerian women aged 40 years and above having a mammogram in the past 24 months. Similarly, Adedoyin et al. (2022) found that access to relevant sources of information significantly influences women's screening-related behaviour in Nigeria, highlighting the need to enhance awareness of breast cancer screening methods.

Many women still opt-out of screening programmes because of cultural beliefs, fear of diagnosis and limited awareness (Abugu *et al.,* 2023). Despite the growing evidence on burden of breast cancer and barriers to screening in Nigeria, there is limited context specific evidence on how knowledge on the various breast cancer screening methods translate to actual screening practice among women in Oye Ekiti. Previous studies have looked at knowledge or practice alone or in other regions in Nigeria, thus creating a gap in the understanding of the knowledge-practice link in this population. This study bridges this gap by concurrently assessing knowledge and practice of breast cancer screening methods and the relation between the two among women in Oye Ekiti.

Specifically, the research aimed to answer the following research questions:

1. What is the extent of knowledge of breast cancer screening methods among women in Oye Ekiti?

2. What is the prevalence of practice of breast cancer screening methods among women in Oye Ekiti?

3. Is there a significant association between knowledge and practice of breast cancer screening methods among women in Oye Ekiti?

The hypothesis was tested based on the third research question:

H0: There is no significant relationship between knowledge and practice of breast cancer screening methods among women in Oye Ekiti.

The findings of this study will provide an evidence base for the current state of knowledge and practice of women on breast cancer screening in Oye Ekiti and will inform the design of targeted interventions for improving early detection and treatment outcomes in the area.

Methods

This section presents the methodology used in the study to attain the objectives of the study which are: to assess the level of knowledge of breast cancer screening methods among women in Oye Ekiti; to examine the prevalence of practice of the breast cancer screening methods and to investigate the relationship between knowledge and practice of breast cancer screening methods among women in Oye Ekiti.

The present study used cross sectional survey design with a quantitative approach. This design enabled the collection of data from a large sample of women in Oye Ekiti, thus, assessment of knowledge and practice of breast cancer screening methods. The quantitative approach was appropriate because it enabled statistical analysis of the relationship between variables. This design is acknowledged to have potentially limited the depth of understanding of individual experiences and perspectives, but was considered appropriate in relation to the research objectives and the resources available.

The target population for this study was the women in Oye Ekiti. A convenience sampling technique was used to recruit participants from various public settings in Oye Ekiti (including markets, religious centres, and community gatherings) based on availability and willingness to participate. The sample size was calculated using the Cochran formula for unknown population at 95% confidence level, which gave a minimum sample size of 385 participants.

Data were collected through a structured questionnaire prepared by the researcher based on review of relevant literature. The questionnaire was structured into sections focusing on socio-demographic characteristics of participants, knowledge of breast cancer screening methods and practice of these methods. Instrument was checked by professional; face validity was done by my supervisor. Through the questionnaire I informed the participants about the study, I followed the ethical principle of informed consent, voluntary participation and confidentiality.

The questionnaire was administered to women in Oye Ekiti at their places. Each participant gave informed consent before administration, stressing the voluntary nature of participation, the confidentiality of responses, and the right to withdraw at any time. The advantage of the questionnaire was that it collected data in a quantitative way and in a short period of time, and any doubts of the participants about the questions could be clarified on the spot.

Data were processed using SPSS (Statistical Package for the Social Sciences). We used univariate analysis (descriptive statistics) such as frequencies and percentages to describe demographic characteristics and to measure the level of knowledge on breast cancer screening methods. The prevalence of practice of these methods was determined by calculating the proportion of women who reported the use of each method. The association between knowledge and practice on breast cancer screening methods was ascertained using bivariate analysis with Pearson Chi-square test. Multivariate analysis was further done using binary logistic regression to identify predictors of practice.

Results

This section presents the analysis of the data collected for the study. Data are presented by frequency and percentage distribution tables. The Pearson Chi-square test was used to evaluate the association between variables and all decisions on the tested hypotheses were made at the 5% level of significance.

Demographic Characteristics of Respondents

Table 1: Distribution of Respondents' Demographic Characteristics

Variables	Frequency	Percentage (%)
Age of Respondent		
18-25	48	12.5
26-35	82	21.3
36-45	107	27.8
46-55	87	22.6
56 and above	61	15.8
Marital Status of Respondent		
Single	68	17.7
Married	210	54.5
Divorced	70	18.2
Widowed	37	9.6
Educational Level of Respondent		
No formal education	71	18.4

Primary education	50	13.0
Secondary education	77	20.0
Tertiary education	187	48.6
Employment Status of Respondent		
Employed	106	27.5
Unemployed	97	25.2
Self employed	126	32.7
Student	21	5.5
Homemaker	35	9.1
Ethnicity of Respondent		
Yoruba	195	50.6
Hausa	102	26.5
Igbo	82	21.3
Others	6	1.6
Religion of Respondent		
Christianity	256	66.5
Islam	100	26.0
Traditional	24	6.2
Others	5	1.3
Income Level of Respondent (Naira)		
Less than 30,000	154	40.0
30,000 - 50,000	158	41.0
Greater than 50,000	73	19.0
Knowledge of Breast Cancer Screening Methods		

Yes	269	69.9
No	116	30.1
Knowledge of Mammography		
Yes	122	31.7
No	263	68.3
Knowledge of Breast Self-Examination		
Yes	230	59.7
No	155	40.3
Knowledge of Clinical Breast Examination		
Yes	158	41.0
No	227	59.0
Knowledge of Breast Ultrasound		
Yes	118	30.6
No	267	69.4
Knowledge of Magnetic Resonance Imaging		
Yes	80	20.8
No	305	79.2
Knowledge of Breast Biopsy		
Yes	111	28.8
No	274	71.2
Practice of Breast Cancer Screening Methods		
Yes	243	63.1
No	142	36.9
Practice of Mammography		

Yes	77	20.0
No	308	80.0
Practice of Breast Self-Examination		
Yes	219	56.9
No	166	43.1
Practice of Clinical Breast Examination		
Yes	139	36.1
No	246	63.9
Practice of Breast Ultrasound		
Yes	76	19.7
No	309	80.3
Practice of Magnetic Resonance Imaging		
Yes	82	21.3
No	303	78.7
Practice of Breast Biopsy		
Yes	95	24.7
No	290	75.3
Total	385	100.0

Source: Field survey, 2024

The majority of respondents in Table 1 were within the age range of 36-45 years (27.8%), married (54.5%) and have tertiary education (48.6%). Most were self-employed (32.7%), Yoruba (50.6%), Christian (66.5%) and earned between 30,000 and 50,000 naira (41.0%). Overall, 69.9% of respondents had at least one knowledge of breast cancer screening method, but the knowledge on each method was different: 59.7% knew about breast self-examination, 41.0% knew about clinical breast examination, 31.7% knew about mammography, and less was known about breast ultrasound (30.6%), breast biopsy (28.8%), and magnetic resonance imaging (20.8%). In practice, 63.1% of respondents had practiced at least one breast cancer screening method, breast self-examination was the most practiced (56.9%), followed by clinical breast

examination (36.1%) and mammography (20.0%); the practice of the diagnostic procedures was lower, from 19.7 to 24.7%.

Bivariate Analysis

Table 2: Chi-Square Test of Association Between Respondents' Characteristics and Practice of Breast Cancer Screening Methods

Variables	No (%)	Yes (%)	χ^2 (df)	P-value
Age				
18-25	15 (31.2%)	33 (68.8%)	1.252 (4)	0.869
26-35	31 (37.8%)	51 (62.2%)		
36-45	38 (35.5%)	69 (64.5%)		
46-55	33 (37.9%)	54 (62.1%)		
56 and above	25 (41.0%)	36 (59.0%)		
Marital Status of Respondent				
Single	28 (41.2%)	40 (58.8%)	0.799 (3)	0.850
Married	74 (35.2%)	136 (64.8%)		
Divorced	26 (37.1%)	44 (62.9%)		
Widowed	14 (37.8%)	23 (62.2%)		
Educational Level of Respondent				
No formal education	47 (62.2%)	24 (33.8%)	37.515 (3)	0.000
Primary education	20 (40.0%)	30 (60.0%)		
Secondary education	28 (36.4%)	49 (63.6%)		
Tertiary education	47 (25.1%)	140 (79.9%)		
Employment Status of Respondent				
Employed	40 (37.7%)	66 (62.3%)	29.393 (4)	0.000

Unemployed	45 (46.4%)	52 (53.6%)		
Self employed	25 (19.8%)	101 (80.2%)		
Student	12 (57.1%)	6 (42.9%)		
Homemaker	20 (57.1%)	15 (42.9%)		
Ethnicity of Respondent				
Yoruba	72 (36.9%)	123 (63.1%)	1.373 (3)	0.712
Hausa	40 (39.2%)	62 (60.8%)		
Igbo	29 (35.4%)	53 (64.6%)		
Others	1 (16.7%)	5 (83.3%)		
Religion of Respondent				
Christianity	92 (35.9%)	164 (64.1%)	32.748 (3)	0.000
Islam	26 (26.0%)	74 (74.0%)		
Traditional	21 (87.5%)	3 (12.5%)		
Others	3 (60.0%)	2 (40.0%)		
Income Level of Respondent (Naira)				
Less than 30,000	99 (64.3%)	55 (35.7%)	85.447 (2)	0.000
30,000 - 50,000	35 (22.2%)	123 (77.8%)		
Greater than 50,000	8 (11.0%)	65 (89.0%)		
Knowledge of Breast Cancer Screening Methods				
Yes	35 (13.0%)	234 (87.0%)	218.554 (1)	0.000
No	107 (92.2%)	9 (7.8%)		
Knowledge of Mammography				
Yes	18 (14.8%)	104 (85.2%)	37.568 (1)	0.000
No	124 (47.1%)	139 (52.9%)		

Knowledge of Breast Self-Examination				
Yes	36 (15.7%)	194 (84.3%)	110.617 (1)	0.000
No	106 (68.4%)	49 (31.6%)		
Knowledge of Clinical Breast Examination				
Yes	18 (11.4%)	140 (88.6%)	74.797 (1)	0.000
No	124 (54.6%)	103 (45.4%)		
Knowledge of Breast Ultrasound				
Yes	6 (5.1%)	112 (94.9%)	73.904 (1)	0.000
No	136 (50.9%)	131 (49.1%)		
Knowledge of Magnetic Resonance Imaging				
Yes	5 (6.2%)	75 (93.8%)	40.706 (1)	0.000
No	137 (44.9%)	168 (55.1%)		
Knowledge of Breast Biopsy				
Yes	6 (5.4%)	105 (94.6%)	66.384 (1)	0.000
No	136 (49.6%)	138 (50.4%)		

Source: Field survey, 2024

As shown in Table 2, there was no statistically significant association between practice of breast cancer screening methods and age, $\chi2(4, N = 385) = 1.252$, $p = .869$; marital status, $\chi2(3, N = 385) = 0.799$, $p = .850$; or ethnicity, $\chi2(3, N = 385) = 1.373$, $p = .712$. However, there were significant relationships between practice and educational level, $\chi2(3, N = 385) = 37.515$, $p < .001$, employment status, $\chi2(4, N = 385) = 29.393$, $p < .001$, religion, $\chi2(3, N = 385) = 32.748$, $p < .001$, and income level, $\chi2(2, N = 385) = 85.447$, $p < .001$. Those who had tertiary education, who were self-employed and who were in the higher income bracket reported a higher practice rate.

Additionally, there were significant associations between practice and knowledge of each screening or diagnostic method assessed (all p .001): breast cancer screening methods overall knowledge, 2 (1, N = 385) = 218.554; knowledge of mammography, 2 (1, N = 385) = 37.568; breast self-examination, 2 (1, N = 385) = 110.617; clinical breast examination, 2 (1, N = 385) = 74.797; breast ultrasound, 2 (1, N = 385) = 73.904; magnetic resonance imaging, 2 (1, N = 385)

= 40.706; breast In all methods, people who reported knowledge of a method were significantly more likely to report using it.

Multivariate Analysis

Table 3: Binary Logistic Regression of Predictors of Practice of Breast Cancer Screening Methods

Variables	Odds Ratio (95% CI)	P-value
Educational Level of Respondent (Ref: Tertiary education)		
No formal education	0.136 (0.027-0.674)	0.015
Primary education	2.051 (0.452-0.674)	0.352
Secondary education	0.426 (0.110-9.311)	0.215
Tertiary education	1.000	-
Employment Status of Respondent (Ref: Homemaker)		
Employed	0.230 (0.026-2.040)	0.187
Unemployed	0.256 (0.033-1.987)	0.192
Self employed	0.550 (0.064-4.718)	0.586
Student	0.118 (0.008-1.729)	0.119
Homemaker	1.000	-
Religion of Respondent (Ref: Others)		
Christianity	0.049 (0.002-0.976)	0.048
Islam	0.348 (0.020-6.086)	0.470
Traditional	0.013 (0.000-0.493)	0.019
Others	1.000	-

Income Level of Respondent (Ref: Greater than 50,000)		
Less than 30,000	0.243 (0.063-0.933)	0.039
30,000 - 50,000	3.141 (0.601-16.424)	0.175
Greater than 50,000	1.000	-
Knowledge of Breast Cancer Screening Methods (Ref: Yes)		
No	10.455 (2.560-42.701)	0.001
Yes	1.000	-
Knowledge of Mammography (Ref: Yes)		
No	4.193 (1.056-16.648)	0.042
Yes	1.000	-
Knowledge of Breast Self-Examination (Ref: Yes)		
No	4.548 (1.340-15.434)	0.015
Yes	1.000	-
Knowledge of Clinical Breast Examination (Ref: Yes)		
No	3.220 (1.061-9.775)	0.039
Yes	1.000	-
Knowledge of Breast Ultrasound (Ref: Yes)		
No	7.991 (1.976-32.310)	0.004
Yes	1.000	-
Knowledge of Magnetic Resonance Imaging (Ref: Yes)		
No	2.134 (0.572-7.961)	0.259
Yes	1.000	-
Knowledge of Breast Biopsy (Ref: Yes)		
No	1.072 (0.284-4.049)	0.918

Yes	1.000	-

Source: Field survey, 2024

As shown in Table 3, respondents with no formal education were significantly less likely to practise breast cancer screening methods compared to respondents with tertiary education (OR = 0.136, 95% CI: 0.027-0.674, p =.015). Respondents with income less than 30,000 naira were significantly less likely to practise screening compared with those earning more than 50,000 naira (OR=0.243, 95% CI: 0.063-0.933, p=.039). Christian (OR=0.049, p=0.048) and Traditional (OR=0.013, p=0.019) respondents were significantly less likely to practise screening as compared to respondents of other religious affiliations. Respondents who had no knowledge about breast cancer screening methods were significantly less likely to practise screening than those who had knowledge of screening methods for all screening methods tested: breast cancer screening knowledge overall (OR = 10.455, p =.001), mammography (OR = 4.193, p =.042), breast self-examination (OR = 4.548, p =.015), clinical breast examination (OR = 3.220, p =.039), and breast ultrasound (OR = 7.991, p =.004). Practice was not significantly associated with knowledge of magnetic resonance imaging and breast biopsy (p>.05). None of the other variables in the model was statistically significant.

Discussion

This study is an evaluation of knowledge and practice of breast cancer screening methods and the association between them among women in Oye Ekiti. The findings revealed that the majority of respondents (69.9%) knew at least one method of breast cancer screening but the knowledge of individual methods was uneven with mammography and diagnostic procedures such as ultrasound, magnetic resonance imaging and breast biopsy being less well known than breast self-examination. This is an important distinction: ultrasound, MRI and biopsy are typically procedures to investigate an abnormal finding further, not population-level screening. Therefore, low awareness of these procedures is of less concern from a public health perspective than low awareness of the core screening methods, breast self-examination, clinical breast examination and mammography, on which early detection efforts should primarily focus.

The results also showed a significant relationship between knowledge and practice of breast cancer screening methods, women who were aware of a given method were significantly more likely to practice it. This finding is consistent with the Health Belief model that perceived susceptibility and awareness of a health threat are pre-requisites for preventive action, and is consistent with previous evidence from Nigeria. Similarly, Abayomi et al. (2022) found that poor uptake of mammography in Nigerian women was strongly associated with low knowledge of the procedure. However, Adedoyin et al. (2022) showed that the exposure of women to relevant information sources was a major determinant of screening behaviour in Lagos, Nigeria. This and the present findings suggest that knowledge is a necessary but not always sufficient pre-condition for screening practice and that health education interventions in Oye Ekiti should be targeted at closing the knowledge gap on the core screening methods.

Tertiary education and employment status were also significant predictors of practice, with women who had tertiary education or were self-employed reporting higher rates of screening.

Higher education is likely to improve health literacy and ability to access and interpret health information. Self-employment or paid work may afford women more financial autonomy and time flexibility to attend screening services, both of which have been identified as barriers to screening among Nigerian women. Income level also showed a similar trend, with women in the lowest income bracket being significantly less likely to undergo screening compared to those with higher incomes. This reflects the cost-related barriers to accessing mammography and clinical services that have been documented in other Nigerian settings (Abugu *et al.,* 2023). Religion became a more robust, but more complex, predictor of practice. Christian and Traditional respondents were significantly less likely to report screening practice compared to respondents of other religious affiliations. This may be reflective of the impact of religious or fatalistic health beliefs where illness is attributed to spiritual causation and preventive medical action is deprioritised in favour of faith-based coping, a pattern that has been observed as a cultural barrier to breast cancer screening in Nigeria (Abugu *et al.,* 2023). However, this finding should be interpreted with caution due to the low number of respondents identifying with religions other than Christianity and Islam in this sample and requires further investigation with a larger, more balanced sample.

These findings are consistent with international evidence linking breast cancer knowledge and screening behaviour. Similarly, Alshahrani et al. (2023) revealed that women's knowledge of breast cancer and its screening methods influenced their participation in screening practices. Abbas and Baig (2023) reported that increased knowledge of risk factors of breast cancer was significantly associated with increased participation in screening activities. Al-Mousa et al. (2024) and Odhiambo et al. (2023) also noted that women with a better knowledge of breast cancer were more actively involved in practising screening behaviours. This consistency of evidence across different settings highlights the importance of educational interventions to increase screening uptake, while the present study adds to this evidence in a previously under-studied Nigerian population and further identifies the importance of intersectionality factors such as education, employment, income and religion to inform the design and targeting of such interventions.

Conclusion

The study revealed that most women in Oye Ekiti had general knowledge of breast cancer screening, but awareness and practice of specific screening methods, particularly mammography, were low. Practice was significantly associated with knowledge of screening methods, as were educational attainment, employment status, income level and religion. The findings revealed that breast cancer screening education needs to be strengthened and access to screening services improved in Oye Ekiti to support earlier detection and better breast cancer outcomes among women in the community.

Recommendations

Based on the findings of this study the following recommendations are suggested:

- Community Screening Programmes: Local health authorities should establish regular community-based breast cancer screening programmes, especially clinical breast examination and mammography outreach to improve access for women in Oye Ekiti.

- Integration into primary health care Breast cancer screening and health education should be incorporated into routine primary health care services, so that screening is offered as part of women's regular health check-ups, and does not require a separate point of contact.

- Outreach by female health workers: There is a need to train and deploy community and female health workers to provide targeted breast cancer education and encourage screening practice, especially among women with lower educational attainment and income who were found to have lower rates of practice in this study.

- Subsidised Mammography Services: Government and public health stakeholders should consider subsidising the costs of mammography and other screening services. This would address the financial barriers to screening identified among lower income respondents in this study.

Limitations of the Study

The study has some limitations. First, the use of a convenience rather than probability-based sampling technique limits generalisability of the findings beyond the sampled population. Second, the cross-sectional design does not permit causal inference on the association between knowledge and practice of breast cancer screening. Third, data were self-reported and may be affected by social desirability or recall bias. Future studies should consider probability sampling and longitudinal designs to overcome these limitations.

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