Journal of Cancer Policy 20 (2019) 100179

Contents lists available at ScienceDirect

Journal of Cancer Policy

journal homepage: www.elsevier.com/locate/jcpo

Original Research

Breast cancer awareness, knowledge and screening practice among women resident in an urban local government area of Oyo State, Nigeria

Ajibola Idowu[a,*], Samuel Anu Olowookere[b], Aderonke Olumide[a], Gbenga Omotola Popoola[c], Adeola Abiodun[a], Ayotemi Oluwagbemi[a], Damilola Olawuyi[a], Olayinka Fakorede[a], Olagoke Folorunsho[a], David Ibitokun[a], Chiamaka Chigbu-Jonah[a], Philip Adegboye[a], Olaoluwa Adebayo[a], Oluwafemi Akin-Adigun[a], Idowu Omidoyin[a]

[a] Department of Community Medicine, Bowen University Teaching Hospital, Ogbomoso, Nigeria
[b] Department of Community Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria
[c] Department of Pysichiatry, Federal Teaching Hospital, Ido, Ekiti State, Nigeria

ARTICLE INFO

Keywords:
Awareness
Knowledge
Practice Breast cancer screening
Nigerian women

ABSTRACT

Background: Breast cancer has emerged as the most common female malignancy globally and in Nigeria in the past few decades. Little is currently known at the household level about breast cancer screening practices of the Nigerian women.

Study objectives: The study assessed awareness, knowledge and practice of women in Ogbomoso South Local Government Area (LGA) on breast cancer screening.

Methodology: The study employed Community-based cross-sectional design and multi-stage sampling technique was used to recruit 332 consenting women. Interviewer-guided, self-administered, semi-structured questionnaire was used for data collection. Data collected were analysed using descriptive and inferential statistics.

Results: The mean age of the respondents was 40.8 ± 13 years; 44.9% of the women had ever screened for breast cancer. Factors that were significantly associated with practice of breast cancer screening included having tertiary education ($p < 0.001$), ever use of family planning methods ($p = 0.018$), ever heard of breast cancer ($p < 0.001$), ever heard of breast examination ($p < 0.001$), having relatives who had died of breast cancer ($p = 0.018$) and having good knowledge of the disease ($p < 0.001$). Women who were aware of screening were eight times more likely to have practised breast cancer screening compared to those who had no knowledge (aOR 7.6, 95%CI 4.1–14.2).

Conclusion: Knowledge and practice of breast cancer screening were low among community based women. There is urgent need to intensify breast cancer awareness campaigns among this population in Nigeria.

1. Background

Cancer is now the second leading cause of death globally; responsible for 8.8 million deaths in 2015 and accounting for about 1 in 6 deaths worldwide. Approximately 70% of cancer deaths occur in low and middle income countries including Nigeria [1]. More than 14 million people develop cancer every year, and this figure is projected to rise to over 21 million by 2030 [2]. Moreover, the economic impact of cancer has been hugely alarming in the recent past; the total annual economic cost of cancer in 2010 alone was estimated at approximately US$ 1.16 trillion [3].

In the last two decades, breast cancer has emerged as the most common female malignancy globally [4]. In 1996, Solanke and Adebamowo revealed that breast cancer has overtaken cervical cancer as the leading female malignancy in Nigeria [5]. More recent data of the World Health Organization (WHO) also buttress this trend; breast cancer currently accounts for 34.2% of cancer mortalities among Nigerian women [6]. Ekanem and Parkin also reported that both breast and cervical cancers accounted for 60.4% of all cancers among Nigeria women, with breast cancer having age-standardized rate (ASR) of 35 per 100,000 almost twice as common as cervical cancers which has 21 per 100,000 [7]. Moreover, Jedy-Agba et al. reported a higher ASR of breast cancer among Nigerian women; this ranged from 52.0 per 100,000 in Ibadan to 64.6 per 100,000 in Abuja [8].

Cancer prevention and control plans and strategies are currently weak in Nigeria; only a few population-based cancer registries exist and cancer reporting system is poorly structured [9]. The most cost-effective breast cancer control strategy remains early detection through screening; this has been observed to be one of the keys to meeting

* Corresponding author.
E-mail address: idajibola@yahoo.com (A. Idowu).

https://doi.org/10.1016/j.jcpo.2018.11.001
Received 19 August 2018; Received in revised form 1 November 2018; Accepted 21 November 2018
Available online 01 February 2019

global health and development goals, including the Sustainable Development Goals (SDGs) [3].

In developed countries, cancer burden has been drastically reduced through well-coordinated screening programmes. In fact, Smith et al. recommended that every at risk woman in America must undergo annual breast cancer screening through mammography [10]. Although mammography has proven to be a reliable and valid breast cancer screening method, awareness about this tool, its accessibility and affordability to women has been low in resource-poor countries such as Nigeria where health spending is predominantly through out-of-pocket expenditure. Thus, other cost-effective screening methods such as Breast Self-Examination (BSE) and Clinical Breast Examination (CBE) come handy in such countries. Studies have shown that 40% of diagnosed breast cancers are detected through BSE, thus validating the usefulness of the procedure in breast cancer screening [11].

Indeed, studies have been conducted in Nigeria on breast cancer, yet the burden of the disease has remained monumental as cases are often detected late, thus warranting increased researcher efforts towards its prevention and control. Moreover, most of the previous studies on breast cancer have been institutional-based, often focusing on educated and professional women. Information from such studies may not reflect the true breast cancer situation in the Nigerian communities. Studies such as the current one become imperative. The study sought to assess awareness of women in Ogbomoso South Local Government Area (LGA), their knowledge on breast cancer and breast cancer screening practices. The study aimed to provide useful information to guide policy makers in designing implementable breast cancer prevention program in Nigeria.

2. Materials and methods

2.1. Description of study area

The study was conducted in Ogbomoso South LGA, Oyo State, Nigeria which has ten electoral wards and a projectected population size of 118,980 as of 2012 [12]. The predominant religions include Christianity, Islam and Traditional religion. Most inhabitants are farmers but civil servants and traders also constitute a large proportion of the people. Yoruba is the preponderant ethnic group but people from Igbo and Hausa extractions are also living in various communities of the LGA.

2.1.1. Study design

The study employed cross-sectional design.

2.1.2. Study participants and sampling

The sample size was calculated using the Leslie Kish formula for estimating single proportion [13]. Reviewing the results of a similar study in Nigeria [14], authors assumed that 18% of our study participants would have been practising regular BSE. A standard relative deviate of 1.96 and a precision of 5% were used. A 10% non-response rate was envisaged among study participants and correction for this was made. Also, correction for possible cluster effect was made by multiplying the estimated sample size by 1.3; thus, the minimum sample size was 328.

Study participants were recruited using multi-stage sampling method over a period of one month (June 2018). Firstly, three out of the ten electoral wards in Ogbomoso South LGA were selected using simple random sampling method (Balloting); the selected electoral wards included Arowomole, Ijeru I and Ijeru II respectively. Secondly, two communities in the selected electoral wards were chosen using simple random method (Balloting). Allocation of respondents was proportional to the population sizes of the selected communities as obtained from the National Population Census office of the LGA. Next, simple random method (Balloting) was employed to pick two streets from each of the selected communities. Systematic sampling technique was used to select households with eligible respondents from each of the two streets selected; sampling interval was calculated by dividing our estimated sample size by the number of respondents that have been allotted to a community. The first household in a street was selected using simple random method (balloting); in houses with more than one households, one was selected using simple random method (balloting).

2.1.3. Inclusion criteria

Women who were at least 18 years of age and who gave their written consents were recruited to participate in the study.

2.1.4. Exclusion criteria

Women who had not been consistently living in the selected communities for at least six months were not allowed to participate in the study.

2.1.5. Data collection method

Data were obtained using semi-structured interviewer guided questionnaire developed by reviewing extant literatures on breast cancer awareness, knowledge and screening. Data were collected on socio-demographic characteristics of the respondents, awareness and knowledge on breast cancer/screening and practices of breast cancer screening. The questionnaire was translated to Yoruba language and back translated to English language for Yoruba speaking respondents. The back translation was neccessary to preserve the original meanings of the questions asked. The questionnaire was pre-tested among 50 women at Oke-Elerin community in Ogbomoso North LGA. Ambiguous questions observed during pre-testing were either re-phrased or removed. Ten clinical students of Bowen University Teaching Hospital, Ogbomoso were trained and they assisted in data collection.

2.1.6. Data analysis

The data were field-edited daily and Statistical Package for Social Sciences (SPSS) version 21 was used for analysis. Descriptive statistics was carried out. Chi-square test was used to compare categorical variables and a stepwise logistic regression model was built to identify factors which were significantly associated with breast cancer screening practices. Independent variables in the model were selected based on whether they were significant at bi-variate level and/or on whether they had been reported in literatures as significant predictors of uptake of breast cancer screening. The level of statistical significance was set at p-value < 0.05. Potential confounders such as age and level of education of respondents were controlled for by analysing the variables in different categories. Adjusted odds ratio (aOR) and 95% confidence interval (C.I) were obtained to identify predictors of breast cancer screening practices among our respondents.

2.2. Key variables and measurements

2.2.1. Respondents' awareness about breast cancer and screening methods

Respondents were asked if they had heard about breast cancer and breast cancer screening methods. The response to each of the questions was "Yes" or "No". Those whose responses were "Yes" to either one or both questions were further asked the sources of their information.

2.2.2. Respondents' knowledge on breast cancer

Four questions were asked on common symptoms of breast cancer, four questions on common risk factors and three questions on its prevention. The responses were scored; correct answers attracted two points while wrong answers attracted zero point. Respondents were rated over a total score of 22points.Those who scored less than 12points were classified as having poor knowledge.

2.2.3. Respondents breast cancer screening practices

Respondents who had ever carried out either SBE or CBE or both were deemed to have been practising breast cancer screening.

2.2.4. Ethical consideration

Ethical approval for this study was sought from the Bowen

Table 1
Socio-demographic characteristics of respondents.

Variable	Frequency N = 332	Percent
Age (years)		
< 20	8	2.4
20 – 39	152	45.8
40 – 59	133	40.1
≥ 60	39	11.7
Mean ± SD	40.8 ± 13.0	
Marital status		
Single/Never married	59	17.8
Married	232	69.9
Divorced	9	2.7
Widowed	31	9.3
Separated	1	0.3
Level of education		
No formal education	37	11.1
Primary school	81	24.4
Secondary	116	34.9
Tertiary level	98	29.5
Religion		
Christianity	253	76.2
Islam	76	22.9
Traditional	3	0.9
Tribe		
Yoruba	278	83.7
Igbo	48	14.5
Hausa	2	0.6
Others	4	1.2

Table 2
Selected breast cancer risks factors among respondents.

Variable	Frequency	Percent
Age at menarche (years)		
< 10	4	1.2
10 – 19	319	96.1
≥ 20	9	2.7
Currently still experiencing menstrual flow		
Yes	232	69.9
No	100	30.1
Age at cessation of menses (n = 100)		
< 45	33	33.0
≥ 45	67	67.0
Ever used Family planning		
Yes	137	41.3
No	195	58.7
Ever used oral contraceptive pills (n = 137)		
Yes	36	26.3
No	101	73.7
Ever consumed alcohol		
Yes	117	35.2
No	215	64.8
Ever smoked cigarette		
Yes	3	0.9
No	329	99.1
Currently smoking		
Yes	0	0.0
No	3	100.0
No	319	96.1
Had relative who died of breast cancer		
Yes	27	8.1
No	305	91.9

University Teaching Hospital's Research and Ethics Committee. Permissions to conduct the study were obtained from leaders of the various communities used for the study. Written consents were obtained from all respondents. Participation of women was voluntary and confidentiality of their responses was guaranteed by making the questionnaire anonymous. Also, data obtained were saved in a passworded computer. Eligible respondents who had never gone for screening were counselled to do so at the Bowen University Teaching Hospital, Ogbomoso.

Table 3
Awareness, knowledge and practice of respondents on Breast cancer.

Variable	Frequency	Percent
Ever heard of breast cancer		
Yes	258	77.7
No	74	22.3
Ever heard of breast examination		
Yes	122	36.7
No	210	63.3
Confident of knowing what to look for during self-breast examination (n = 122)		
Yes	90	73.8
No	32	26.2
Sources of knowledge on self-breast examination (n = 122)		
Health worker	90	73.8
Husband	10	8.2
Friend	12	9.8
Overall knowledge on breast cancer		
Good	129	38.9
Poor	203	61.1
Conduct regular(monthly) self-breast examination (n = 122)		
Yes	75	61.5
No	47	38.5
Ever had clinical breast examination		
Yes	105	31.6
No	227	68.4
Findings from the last clinical breast examination (n = 105)		
Nothing	99	94.3
Lump	4	3.8
Rash	2	1.9
Other methods of breast cancer screening known		
Breast ultrasound	18	5.4
Mammography	9	2.7
Both	2	0.6
Don't know	303	91.3

3. Results

A total of 350 questionnaires were administered but 332 of them were returned satisfactorily completed by the respondents giving a response rate of 95.0%. Table 1 shows that most (45.8%) of them were 20–39 years old while the mean age (SD) was 40.8 (13.0) years. Majority (69.9%) were married while only 29.5% of them attained tertiary education. Majority of the respondents were Christians (76.2%) while Yoruba constituted the largest ethnic group (83.7%).

Table 2 reveals that 41.3% of the respondents had ever used modern family planning methods; 26.3% of such women had ever used oral contraceptive pills. Also, 35.2% of the women had ever consumed alcoholic drinks. Only 3 (0.9%) of the women had ever smoked cigarette, none of them were current smokers. There was positive family history of breast cancer among 3.9% of the women interviewed.

Table 3 shows that 77.7% of the women were aware of breast cancer with mass media being the commonest sources of information (46.9%; Fig. 1). Only 38.9% of the respondents had good knowledge of breast cancer. Less than half (36.7%) of the respondents had ever heard about BSE; health workers were the sources of information in 73.8% of instances. Almost three-quarter (73.8%) of the women who were aware of BSE said that they had been given sufficient information on how to carry out the exercise appropriately while BSE was being practised regularly (monthly) in 61.5% of such women. Only 31.6% of the

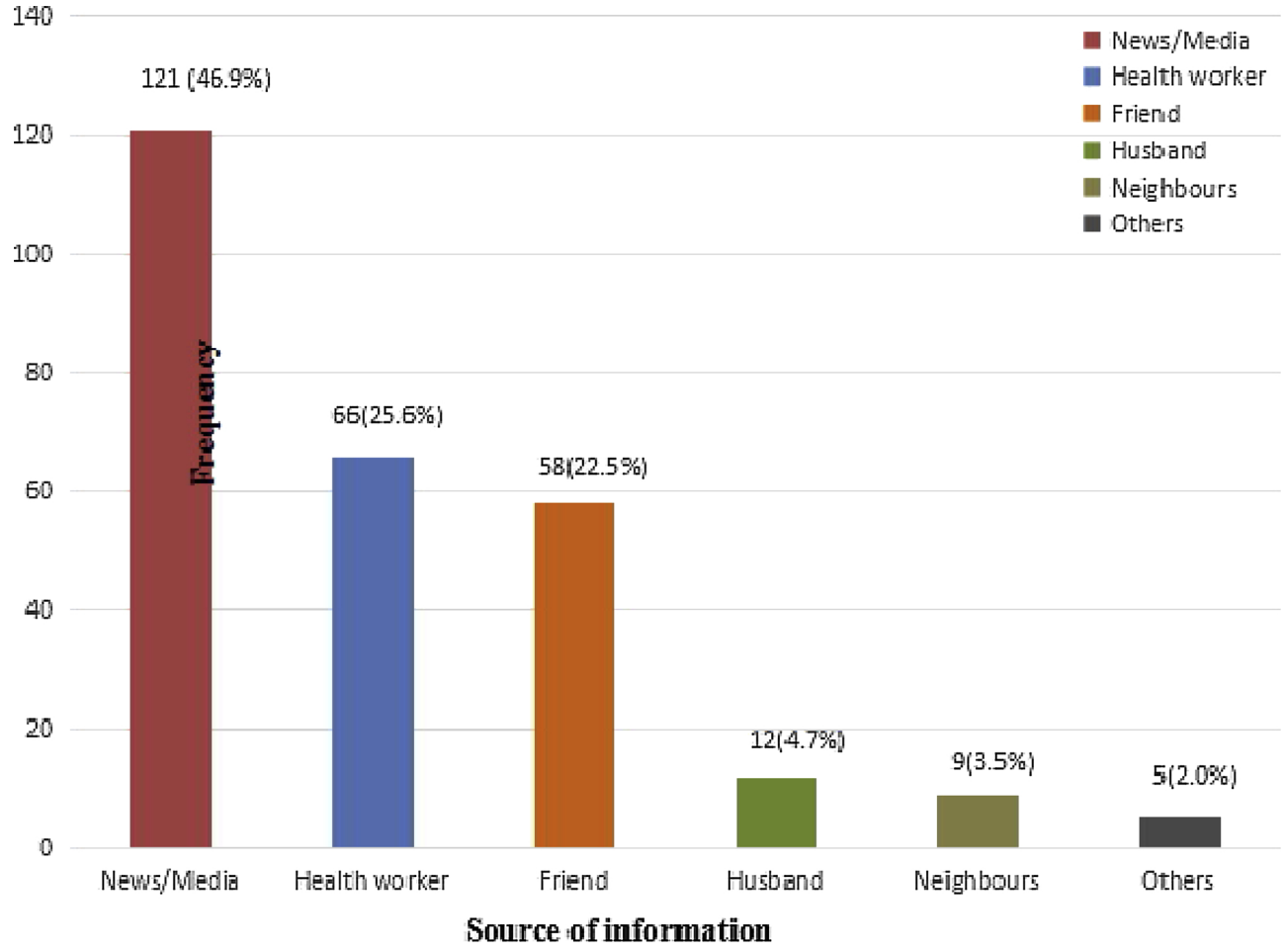

Fig. 1. Respondents' source of information about Breast cancer.
NB: Multiple responses allowed.

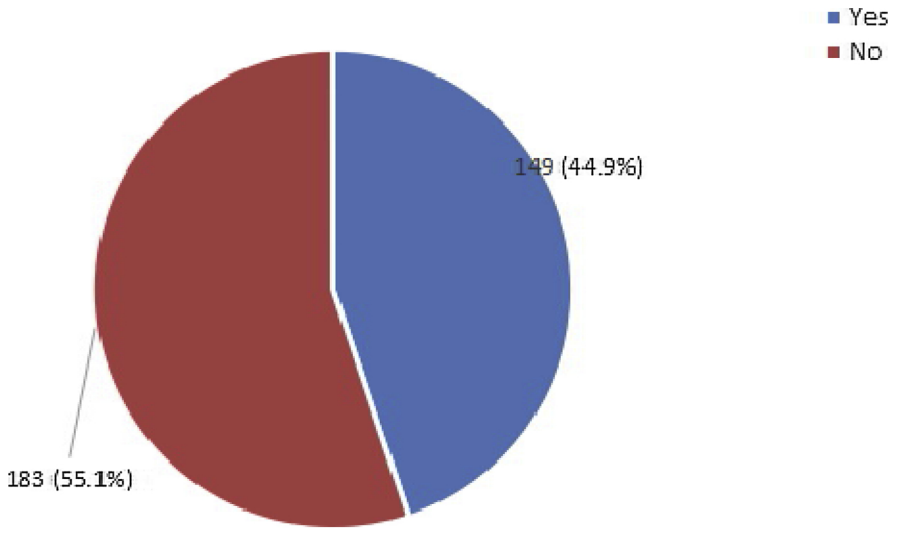

Fig. 2. Practice of breast cancer screening among the respondents (either SBE, CBE or both).

respondents had ever gone for CBE; breast lumps were found in 3.8% of such women. Only 5.4% of the respondents were aware of breast ultrasound while 2.7% were aware of mammography as breast cancer screening tests.

In Fig. 2, 44.9% of the study participants had ever practised breast cancer screening (either SBE, CBE or both). Table 4 shows that the proportion of women who practised breast cancer screening was significantly higher among respondents with tertiary education (61.2%, $p < 0.001$), women who had ever used family planning methods (52.6%, $p = 0.018$), those who had ever heard of breast cancer (95.0%, $P < 0.001$), those who were aware of breast examination (76.2%, $p < 0.001$), those whose relatives had died of breast cancer (66.7%,

Table 4
Factors associated with respondents' breast cancer screening practice.

Variable	Practice of screening			χ^2	*p* value
	Yes n (%)	No n (%)	Total N		
Age (years)					
< 20	2 (25.0)	6 (75.0)	8	4.194 Y	0.241
20 – 39	66 (43.4)	86 (56.6)	152		
40 – 59	68 (51.1)	65 (48.9)	133		
≥ 60	13 (33.3)	26 (66.7)	39		
Marital status					
Single/Never married	18 (30.5)	41 (69.5)	59	6.003	0.050
Married	111 (47.8)	121 (52.2)	232		
Divorced/Widowed/ Separated	20 (48.8)	21 (51.2)	41		
Level of education					
No formal education	9 (24.3)	28 (75.7)	37	20.566	< **0.001***
Primary school	38 (46.9)	43 (53.1)	81		
Secondary	42 (36.2)	74 (63.8)	116		
Tertiary level	60 (61.2)	38 (38.8)	98		
Religion					
Christianity	118 (46.6)	135 (53.4)	253	1.577 Y	0.455
Islam	31 (40.8)	45 (59.2)	76		
Traditional	0 (0.0)	3 (100.0)	3		
Tribe					
Yoruba	125 (45.0)	153 (55.0)	278	0.823 Y	0.844
Igbo	21 (43.8)	27 (56.3)	48		
Hausa	2 (100.0)	0 (0.0)	2		
Others	1 (25.0)	3 (75.0)	4		
Age at menarche (years)					
< 10	0 (0.0)	4 (100.0)	4	1.813 Y	0.404
10–19	145 (45.5)	174 (54.5)	319		
≥20	4 (44.4)	5 (55.6)	9		
Attained Menopause					
Yes	105 (45.3)	127 (54.7)	232	0.045	0.832
No	44 (44.0)	56 (56.0)	100		
Ever use family planning method					
Yes	72 (52.6)	65 (47.4)	137	5.555	**0.018***
No	77 (39.5)	118 (60.5)	195		
Ever heard of breast cancer					
Yes	129 (950.0)	129 (50.0)	258	12.268	< **0.001***
No	20 (27.0)	54 (73.0)	74		
Ever heard of breast examination					
Yes	93 (76.2)	29 (23.8)	122	76.629	< **0.001***
No	56 (26.7)	154 (73.3)	210		
Family history of breast cancer					
Yes	9 (69.2)	4 (30.8)	13	3.243	0.072
No	140 (43.9)	179 (56.1)	319		
Relatives who died of breast cancer					
Yes	18 (66.7)	9 (33.3)	27	5.640	**0.018***
No	131 (43.0)	174 (57.0)	305		
Knowledge of symptoms					
Yes	79 (61.2)	50 (38.8)	129	22.829	< **0.001***
No	120 (59.1)	83 (41.9)	203		

χ^2: Chi square test; Y: Yates' Chi square.
* Significant at *p* value < 0.05.

p = 0.018) and respondents with good knowledge of the disease (61.2%, p < 0.001).

At the multivariate level (Table 5), women who were aware of breast examination were eight times more likely to have had breast cancer screening compared to those who had no knowledge of screening (aOR;7.6, 95%CI;4.1–14.2).

4. Discussion

The current study revealed that 77.7% of the women in the study population were aware of breast cancer. This finding is not surprising as several studies have shown high awareness level on breast cancer in Nigeria [14–17]. Omotara et al. [18] however reported a lower awareness level (58.2%) among women in the Northern part of Nigeria. The disparity could have been due to the fact that the said study was conducted in the rural areas whereas the current study was urban-based. In Nigeria, women living in urban areas tend to have better access to health-related information compared to those in rural areas.

In spite of the relatively high breast cancer awareness level, only 38.9% of our respondents possessed good knowledge of the disease. This finding is in consonance with results from previous Nigerian studies. In 2016, Ojewusi et al. [17], reported that 86.3% of teachers in the urban city of Ibadan, Nigeria had poor knowledge of breast cancer. Secondary school teachers are expected to be better informed on health issues, yet they possessed poor knowledge of breast cancer in the study. In fact, more than half (55.0%) of Nigerian female health workers were reported by Akhigbe and Omuemu [19] to have possessed poor knowledge on risk factors of breast cancer and knowledge of SBE was low among them.

Less than half (36.7%) of our respondents were aware of BSE as a method of breast cancer screening. Our finding is lower than what Osime [20] reported as the awareness level of BSE among women in Benin City, Nigeria. The discrepancy may be due to the fact that the Benin study was carried out among civil servants who are more likely to be better educated and having enhanced access to health-related information for positive decision making. Only 9 (2.7%) of our respondents were aware of mammography. In contrast, Akhigbe and Omuemu [19] reported that 80.7% of their study participants knew about the screening tool; however, the study was conducted among health workers who are expected to demonstrate excellent breast cancer-related knowledge.

Overall, 31.6% of the women had ever conducted SBE. The same proportion of women had ever carried out CBE. These findings agree with reports from previous studies. The study by Omotara et al. [18] revealed that only 24% of the women who participated in their study had ever carried out SBE. Azubike et al. [14] revealed that only 17.7% of women in Benin City practised breast cancer screening while Okobia et al. [21] revealed that only 43.2% of female healthcare workers carried out SBE in the preceding year. In Rivers State, Nigeria, barely 21.1% of women had ever carried out SBE [22].

The proportion of women who practised breast cancer screening was significantly higher among respondents with tertiary education in the current study. Our result is consistent with that of Amoran et al. [23] which revealed that tertiary education was the only predictor of breast cancer screening in a Nigerian rural community. Family planning

Table 5
Predictors of practice of breast cancer screening among the respondents.

Variable	B	*p* value	aOR (95% CI)
Level of education			
No formal education REF			
Primary school	0.67	0.17	1.95 (0.76–5.03)
Secondary	0.14	0.78	1.14 (0.45–2.89)
Tertiary level	0.40	0.42	1.49 (0.56–3.97)
Ever use family planning method No REF	0.44	0.09	1.55 (0.93–2.59)
Ever heard of breast cancer No REF	0.21	0.53	1.24 (0.64–2.39)
Ever heard of breast examination No REF	2.03	< **0.001***	7.58 (4.05–14.19)
Relatives who died of breast cancer No REF	0.72	0.18	2.05 (0.73–5.74)
Knowledge of breast cancer Poor REF	0.001	0.10	1.00 (0.54–1.85)

B: Coefficient of Binary logistic regression; OR: Odds ratio; 95% CI: 95% Confidence Interval.
Predictive value: 74.4%; R^2: 0.313.
Model Chi square: 88.343; *p* value: < 0.001*.

practice was equally significantly associated with breast cancer screening in the current study. This is not an unexpected finding since women who attended family planning clinics and embraced modern contraceptive methods must have at one time or the other been exposed to information which can positively influence their breast cancer screening practices. Our study also showed that awareness and knowledge of breast cancer were significantly associated with screening practices. In fact, awareness of breast cancer screening was the only significant predictor of breast cancer screening practice in our study population. This is in agreement with finding from a study by Azubike et al. [14] which showed that breast cancer screening was significantly influenced by knowledge of the study participants. Our finding is however in contrast to that of a systematic review by Olajide et al. [15] which showed that awareness and knowledge did not influence performance of breast cancer screening. Knowledge has been widely documented in medical literatures as a major determinant of health-related behaviour including cancer screening practices. The proportion of women who had gone for breast cancer screening was also significantly higher among respondents who had lost their relatives to breast cancer. Women with relatives who had died of breast cancer must have been adequately educated about risk factors and preventive strategies of the disease by healthcare workers while taking care of their loved ones in the hospital. The information accessed during such periods of care could have positively influenced our respondents to access breast cancer screening.

5. Conclusion

Breast cancer awareness level is relatively high in the study population but this did not translate to good knowledge about the disease. The proportion of women who had ever carried out any form of breast cancer screening was also low among the respondents. Awareness of BSE was the only significant predictor of breast cancer screening. Authors recommend a paradigm shift in the breast cancer awareness campaigns in Nigeria. While campaigns among elites, civil servants and female healthcare workers should be sustained, it is high time programme implementers began to package robust community-based campaigns to capture the less educated and unemployed women. Such campaign efforts should be done in local languages using effective health communication strategies such social drama and group discussions among homogeneous categories of women in various communities. Mass media should equally be positively engaged in the awareness campaign efforts. Governments at all levels should ensure that the existing primary healthcare facilities are well equipped and staff adequately trained to educate and teach women on BSE. Healthcare staff should further be trained on how to conduct CBE and to refer any woman with breast lumps to hospitals where comprehensive care can be obtained. Non-governmental organizations working to reduce the burden of breast cancer could assist in ensuring that breast cancer information and services in such healthcare facilities are highly subsidized to make them more affordable to women. This will enhance easy access to information and increase uptake of breast cancer screening among Nigerian women.

6. Study limitation

Due to lack of funding, the study was conducted among 332 respondents, this could have reduced the precision of the study. However, due to the fact that multi-stage sampling method was employed, the external validity of the study would have been greatly enhanced.

Conflict of interest

Authors declared no conflict of interest in the conduct of this study.

Acknowledgement

Authors wish to acknowledge the heads of the communities in Ogbomosho South LGA, Oyo State for allowing this study to be conducted in their domains.

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