

Awareness and practice of breast screening and its impact on early detection and presentation among breast cancer patients attending a clinic in Lagos, Nigeria

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Abstract

Background: Breast cancer is the most common malignancy among females in Nigeria. The concept of breast screening (BS) is that it would result in presentation at earlier stages. We evaluated the impact of BS on early detection and presentation of breast cancer and determined the aspects BS need improvement.

Patients and Methods: All patients with a diagnosis of malignant breast lump attending clinics at a tertiary hospital in Nigeria were recruited into the study over a 2-year period. Self-administered questionnaires were given to patients. Data collected were demographics, knowledge about BS, practice of BS, the motivation to practice BS and the source of information on BS.

Results: Of 218 patients seen, 147 (67.4%) patients presented at the surgical outpatient clinic and 71 (32.6%) at the radiotherapy clinic, with age 48.01 ± 0.80 years. A total of 156 (71.6%) were aware of BS, while 62 (28.4%) were not aware. A logistic regression analysis showed that only the level of formal education predicted awareness of BS, $P = 0.001$ Nagelkerke's $R^2 = 0.126$. Awareness of BS was mainly from electronic media 87 (55.7%). There was no significant difference in the ages of those aware and practicing BS 48.03 ± 1.05 years, and those not practicing BS 46.32 ± 1.94 years, $P = 0.446$. There was no significant difference in presentation for those practicing BS 7.41 ± 1.30 months, and those not practicing BS 11.38 ± 2.91 months, $P = 0.175$, with 64% practicing BS presenting late, while 77% not practicing BS presenting late, $\chi^2 = 2.432$, $P = 0.488$. A logistic regression analysis did not show any demographic or clinical parameters as predictive $P = 0.225$ Nagelkerke's $R^2 = 0.126$.

Conclusion: The high level of awareness and practice of BS was not translated into the presentation with early breast cancer.

Key words: Breast screening, mammography, physician clinical examination, self-breast examination

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Introduction

In Nigeria, breast cancer is the most common malignancy among females with age-standardized rate of 38.7/100 000 per year.^[1,2] Survival from cancer is poor in developing countries because of poor diagnostic and treatment facilities, late stage

at presentation resulting from a lack awareness of the breast screening (BS) methods when available.^[2] The peak age for breast cancer in Nigerian women is about a decade earlier than in Caucasians, with most presenting late.^[2-4]

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Breast screening aims to detect early disease with resultant improved prognosis and quality of life from less radical treatment.^[5] The BS offered will depend on the age, family history and other risk factors. Components of BS are breast self-examination (BSE), clinical breast examination (CBE), risk evaluation, screening mammography (SM), and, in selected cases, screening magnetic resonance imaging (SMRI).^[6] Many of the methods are not readily available or accessible, while BSE and CBE are cheap methods of screening that can be easily taught.^[7]

In Nigeria, there are no sustained programs for BS.^[8] However, there have been BS campaigns in the media on BSE and CBE by many nongovernmental organizations (NGOs) and government agencies.^[8] The aim of this paper is to assess the knowledge, attitude, and practice of BS. We also wanted to see if the knowledge and practice of BS has affected the patient presentation.

Materials and Methods

Patients

This study was done at study institution from December 22, 2010 to February 17, 2013. Included are all females attending surgical outpatient clinic and radiotherapy and oncology clinics with a diagnosis of breast cancer.

Methods

At the first visit self-administered structured questionnaires with both open and close-ended questions were given to patients who were literate, while patients who were illiterate used an interpreter. Data collected are demographics, knowledge of BS and components of BS, practice of BSE, CBE, and SM. They were also evaluated for their ability to describe a BSE. The motivation to practice BS and the source of information on BS was documented.

Exclusion

Any patient who admitted to have received any information on BS after finding the breast lump was excluded from the study.

Statistics

The data were entered into an access database and cross validated. The relevant information was exported into the SPSS version 19 statistical package (Statistical Package for Social Sciences, version 19.0 developed by SPSS Inc. Chicago, Illinois). Continuous data is presented as mean \pm SEM, while categorical data is presented as median. The data are also presented as tables and graphs. Statistical inference used Student's *t*-test and for discontinuous categorical variable Chi-square.

A comparison of the dependent variables, between patients who knew of BS and those ignorant with demographic

variables was done with binary logistic regression. Another comparison in patients who were aware of BS was between patients practicing BS and those not practicing BS were done using a logistic regression analysis of factors that would predict whether a patient who is aware of BS would practice BSE. A third multiple logistic regression analysis was done to determine factors contributing to delay in presentation in the patients practicing BS. For the purpose of this study, a delay was defined as patient presenting to the referring physician for assessment >30 days after discovering abnormal breast findings on BS. Also, in this study early presentation is Stages 1 and 2 BC, while late presentation is Stages 3 and 4.

All regression analyses were performed in steps. In the first step, all the parameters were evaluated in univariate regressions and those having $P \leq 0.10$ were included in subsequent forward stepwise logistic multiple regressions. The predictors that remained were further tested in the final regression models. Here, adjusted R^2 was used to explain the variance in the multiple regression models and Nagelkerke's R^2 was used as an approximation of this measure in logistic regressions.

Results

A total of 218 patients were seen, 147 (67.4%) at the surgical outpatient, while 71 (32.6%) were referred to the radiotherapy clinic. The age range is 19-84 years, with a mean age of 48.01 ± 0.80 . Most of the patients 190 (87.2%) were married, 12 (5.5%) were single, and 3 (1.4%) were divorced. For the purpose of further study, widowed and single patients were grouped into patients without partners, while married patients were grouped into patients with partners. Forty-seven (21.6%) were illiterate, 28 (12.8%) were educated to primary school, 77 (35.3%) had some secondary schooling, while 66 (30.3%) had some tertiary education. Majority of the patients were of the religious persuasion of Pentecostal faith 113 (51.8%), 64 (29.4%) were of orthodox Christian faith, 28 (12.8%) of the patients were Muslims and 13 (6%) of the patients did not indicate any faith. In the belief system, all patients admitted that there were spiritual factors involved in BC and miracle healing and alternative care are options of treatment.

Most of them, 156 (71.6%), mean age 47.02 ± 1.05 years knew of BS, while 62 (28.4%) 48.32 ± 1.55 years mean age were ignorant of BS. The Levene's test for variance did not show any difference in variance $P = 0.806$; there was no significant difference in the ages of the two groups $P = 0.501$ [Table 1]. Those who knew of BS knew about early detection, however, none was aware that early detection could result in breast conservation surgery as all expressed the fear of breast loss resulting from surgical treatment of breast cancer. The logistic regression show

that the only factor that can predict whether a patient is aware of BS is the level of formal education; this group being more educated in terms of secondary and tertiary education schooling $P = 0.004$ and patients who had no formal education are more likely not to be aware of BS $P = 0.001$ [Table 2] ($\chi^2 = 6.302, P = 0.613$ with $df = 8$). Nagelkerke's $R^2 = 0.126$.

For the 156 patients who knew of BS, the source was from the media in 89 (57.1%) of the patients [Table 3] mainly radio and television programs in 87 patients and newspapers in 2. While the education was from a health worker in 31 (19.9%), the majority in this group 30 were educated by a medical doctor after consultation for breast symptoms; only one patient was educated on BSE by a nurse during routine antenatal visit. NGO campaigns accounted for 15 (9.6%) of patients. When the patients were questioned about their knowledge of all aspects of BS, all 156 patients who knew of BS knew of BSE, only 3 of the 156 patients knew of the importance of an annual CBE in BS. It was found that 16 had done one diagnostic

mammogram, and 5 had done a diagnostic breast ultrasound scan (BUS) in the past. These 16 patients belong to the subsets that were taught BSE by a medical doctor. Though, the importance of repeated investigations was emphasized to these patients none were on screening with imaging on cost consideration. None of the patients knew that SMRI can be used in the early detection of breast cancer. Of the 156 patients that knew of BS, 122 (56.0%) were practicing BSE, in these patients 98 (45.0%) admitted to regular BSE monthly. On further enquiry on their level of proficiency and knowledge of BSE, 116 (53.2%) were found to be able to accurately describe the procedure. In this group, 47 patients were not sure of the duration that they had been practicing BSE while the remaining had been on BSE for 1-156 months with a mean 17 ± 1.92 months [Table 4].

The mean age of the patients who knew and practiced BS was 48.03 ± 1.05 years, while the age of the patients that knew and did not practice BS was 46.32 ± 1.94 years. There was no significant difference in the ages of these two groups $P = 0.446$. The duration from discovery of the lump to presentation at a medical facility for those practicing BS was 7.41 ± 1.30 months, while the duration of presentation for those not practicing BS was 11.38 ± 2.9 months $P = 0.175$ [Table 4]. Most 94 (77%) of 122 patients that were on BSE presented with Stages 3 and 4 disease while 22 (64%) of patients not on BSE presented with Stages 3 and 4 disease, $\chi^2 = 2.432, P = 0.488$ [Table 5].

A logistic regression analysis to determine which variables will determine whether a woman who knew about BSE will practice BSE using age, marital status, educational status, religion, method of education for BSE and history of cancer in a relative was used as predictive variables. A test of the full model against a constant only model was not statistically significant, indicating that the predictors as a set cannot reliably distinguish between those that practiced BSE and those who did not practice BSE ($\chi^2 = 11.884, P = 0.225$ with $df = 9$). Nagelkerke's $R^2 = 0.126$ indicated a weak relationship between prediction and grouping, that is, 57.6% between predictors and prediction. Prediction success overall was 12.6%, which was weak. The Wald's criterion demonstrated that none of the tested factors made a significant contribution to prediction ($P \geq 0.05$) [Table 6].

Table 1: Demographic information of patients aware of screening and those not aware of screening

Variables	Awareness		Total	P value
	Yes	No		
Patients				
n (%)	156 (71.6)	62 (28.4)	218 (100)	
Age				
Mean	47.02±1.049	48.32±1.559	48.01±0.80	P=0.501
Marital status n (%)				
With partners	136 (62.3)	54 (24.8)	190 (87.1)	$\chi^2=0.000$
Without partners	20 (9.2)	8 (3.7)	28 (12.9)	P=0.987
Educational status n (%)				
None	28 (12.8)	19 (8.7)	47 (21.5)	$\chi^2=13.285$
Primary	16 (7.3)	12 (5.5)	28 (12.8)	P=0.004
Secondary	55 (25.2)	22 (10.1)	77 (35.3)	
Tertiary	57 (26.2)	9 (4.1)	66 (30.3)	
Religion n (%)				
Pentecostal	78 (35.779)	35 (16.055)	113 (51.834)	$\chi^2=5.502$
Orthodox	52 (23.85)	12 (5.504)	64 (29.357)	P=0.139
Muslim	19 (8.715)	9 (4.128)	28 (12.844)	
None	7 (3.211)	6 (2.752)	13 (5.963)	

Table 2: Logistic regression analysis of predictive factors for predicting awareness of BSE

Predictive factor	β	SE	Wald	Odds ratio	95% CI	P value
Age (years)	0.014	0.014	1.025	1.015	0.987-1.043	0.311
Married or with partner	0.105	0.473	0.049	1.110	0.440-2.803	0.825
Educational level (overall)			13.217			0.004
No formal education	-1.614	0.492	10.777	0.199	0.076-0.522	0.001
Primary	-1.723	0.550	9.803	0.179	0.061-0.525	0.002
Secondary	-0.964	0.443	4.748	0.381	0.160-0.908	0.029
Constant	1.215	0.706	2.961	3.370		0.085

β =Estimated coefficient for independent variables; SE=Standard error; CI=Confidence interval; BSE=Breast self-examination

Table 3: Cross tabulation of source of information of breast screening with patients practicing breast screening

Source of information	Practicing breast screening n (%)		
	No	Yes	Total
Media	16 (10.3)	73 (46.8)	89 (57.1)
Health worker	7 (4.5)	24 (15.4)	31 (19.9)
NGO campaigns	5 (3.2)	10 (6.4)	15 (9.6)
Internet	0 (0)	2 (1.3)	2 (1.3)
Family member/friend	4 (2.5)	9 (5.8)	13 (8.3)
Not sure	2 (1.3)	4 (2.5)	6 (3.8)
Total	34 (21.8)	122 (78.2)	156 (100)

$\chi^2=3.584, P=0.611$. NGO=Nongovernmental organizations

Table 4: Comparison of patients on breast screening with patients not on breast screening

Variables	Screening status		Total	P value
	Yes	No		
Number	122	34	156	
Age				
Mean	48.03±1.049	46.32±1.936	47.66±0.92	0.446
Presentation				
Months	7.41±1.30	11.38±2.91	17±1.92	0.175
Marital status n (%)				
With partners	105	31	136	
Without partners	17	3	20	$\chi^2=0.621$ 0.431
Educational status				
None	18	10	28	
Primary	11	5	16	
Secondary	48	7	55	
Tertiary	45	12	57	$\chi^2=6.694$ 0.082
Religion				
Pentecostal	62	16	78	
Orthodox	42	10	52	
Muslim	14	5	19	
None	4	3	7	$\chi^2=2.326$ 0.508
Cancer in first degree relative				
No	116	34	150	
Yes	6	0	6	$\chi^2=1.739$ 0.187

Table 5: Cross tabulation of patients' awareness of breast cancer screening with stage at presentation

Stage	Awareness of breast cancer screening n (%)		Total n (%)
	No	Yes	
1	1 (0.6)	2 (1.2)	3 (1.8)
2	11 (7.1)	26 (16.6)	37 (23.7)
3	19 (12.2)	85 (54.5)	104 (66.7)
4	3 (1.9)	9 (5.8)	12 (7.7)
Total	34 (21.8)	122 (78.2)	156 (100)

Fishers exact test applied

Discussion

In this study, majority of the patients were aged between 40 and 60 years, one patient was under 20, very few under 30 or above 70 years of age. This is similar to findings in other studies worldwide where it had been shown that breast cancer is not common in women under 20.^[3,4] The peak age of presentation of the fifth decade in this study was similar to findings in previous publications from Nigeria.^[3,4] This corroborates the finding that breast cancer in women presents a decade earlier than in the western societies.^[3,4] For this reason, BS should be started a decade earlier in our environment.

The dissemination of information on BS in the developed countries varies widely. It may include organized national programs, opportunistic screening or both. These programs are managed at national or regional levels.^[9] However, in Nigeria and other developing countries there are no organized national or regional BS programs. Breast cancer screening awareness in Nigeria as presently organized is *ad-hoc*, by many NGOs using public service programs, the media and campaigns in the form of lectures and demonstration.^[8] Many of these NGOs received funding from government and religious bodies.^[8] This is why the major source of information on BS was from sponsored public service programs on the television in this study. The use of electronic media such as television and radio has also been found to be the most important tool for education on BS in Iran.^[10]

The level of awareness of BS of 71.6% of respondents and level of practice of BSE of 56.0% is similar to the finding in a population study 74.17% of women in Buea, Cameroon being aware of BSE with 60% practicing BSE^[11] and 61% awareness of BS and BSE in Iran.^[10] It is high when compared with a study of 238 women between the ages of 20 and 65 years from Abakaliki, Nigeria that show 38.9% have heard of BSE, 13% aware of CBE and 13.4% being aware of SM. While 23.9% have been taught how to perform BSE, only 21.8% had done BSE in the past with only one knowing the correct frequency and practicing it regularly.^[12] However, this study was carried out on market traders who were less likely to be formally educated. Indeed in the study from Cameroon^[11] where awareness and practice of BS was high, 70.83% of the respondents had completed high school.

In this study, it was also found that single predictive factor on whether a patient would have practiced BS or BSE was the level of formal education of the patient. This was also confirmed by the study from Iran^[10] which showed that respondents aged 40-59 years, married, with higher education were more informed about breast cancer and were more likely to perform BSE. This was not surprising as all patients who were aware and had been educated on BS

Table 6: Logistic regression analysis of predictive factors for predicting practice of BSE

Parameters	β	SE	Wald	Odds ratio	95% CI	P value
Married or with partner	0.925	0.727	1.620	2.522	0.607-10.484	0.203
Age (years)	0.034	0.020	2.769	1.034	0.994-1.076	0.096
Educational level (overall)			6.760			0.080
No formal education	-1.029	0.606	2.889	0.357	0.109-1.171	0.089
Primary	-0.663	0.680	0.950	0.515	0.136-1.954	0.330
Secondary	0.608	0.535	1.288	1.836	0.643-5.245	0.256
Religion (overall)			0.452			0.929
Pentecostal Christian	0.365	0.891	0.168	1.441	0.251-8.251	0.682
Orthodox Christian	0.245	0.949	0.067	1.278	0.199	0.796
Muslim	-0.011	1.030	0.000	0.989	0.131-7.452	
Presence of cancer in a relative	-19.306	16140.507	0.000	0.000	0.000	
Constant	18.716	16140.507	0.000	134405067.642		

β =Estimated coefficient for independent variables; SE=Standard error; CI=Confidence interval, BSE=Breast self-examination

in this study admitted that the programs were conducted in English. There is a need to conduct the BS awareness programs in local languages and translate the instruction manuals into the local languages. This will make the programs more acceptable and effective when conducted in rural populations with a higher number of women without formal education. Their awareness level of 71.6% for BS and BSE is good for a system that is not organized. Awareness level greater than this, will be achieved with an organized BS awareness program.

Analysis of the result showed that there was no significant difference in ages, and there was no predictive factor on whether a patient would or would not practice BS after attending or viewing a BS education program. Though, it has been reported that the most important motivation for a woman to commence BS is her primary physician or other health worker. Other studies have also shown that one of the strongest incentives for women to obtain a SM is the recommendation of their physician.^[7-9] However, in this study, there was no statistically significant difference among woman taught BS by physicians and women receiving such training from other sources to performing a BSE or SM.

Most of the patients on BS 71 (58.2%) knew only about BSE while only 3 (2.5%) were aware of SM. None was aware of CBE as a component of BS. This is because the focus of BS from the sources where the patients received their education was on early detection by BSE, followed by biopsy. The other components of BS such as CBE, SM, and BUS need to be included and emphasized in the BS education. Furthermore, female patients seeing their doctors for nonbreast related conditions should be empowered by BS education to demand a breast examination and have CBE and appropriate referral for SM from their physicians. One important limitation to the widespread adoption of a SM is cost. It was noted that 16 patients who have had a diagnostic mammogram

in the past and were encouraged by their physicians to commence SM could not comply because of cost. In this group, 47 patients were not sure of the duration that they had been on BSE while the remaining had been on BSE for 1-156 months with a mean 17 ± 1.92 months. This shows that most of the patients commenced BS in the last 3 years. This shows that the awareness programs are beginning to be more effective. A very important finding in this study is that there was no difference in the presentation time among patients that were practicing BS and BSE and those who were not. There was delayed presentation in the two groups with most of the patients in the two groups presenting at Stages 3 and 4. The probable reason for this is the finding that most patients were practicing BS with the motivation of detection of BC not for the fact for early detection to reduce morbidity of therapy and cure. Most of the BS educational programs do not emphasize these advantages. It was found that all patients on BS still had fear of breast loss and death from cancer. In addition, the belief system of the patients that the disease is spiritual and amenable to miracle healing resulted in fatalistic outlook with many of patients seeking alternative treatments. This is similar to the belief system of patients reported from Cameroun^[11] with 50% of respondents believing that BC can be cured by spiritual and alternative care.

Conclusion

There was a high level of awareness of BS; however, this was not translated into early presentation. Breast cancer screening awareness was found to be mainly acquired through the electronic media. Women should also be empowered in BS education programs to demand a CBE whenever they consult their physicians. However, for BS to be effective in reducing late presentations, we believe that education on the advantages of early detection such as breast conservation, potential cure and reduction in the morbidity of treatment will encourage patients to present early.

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