

BREAST CANCER SCREENING AWARENESS AND PRACTICE AMONG WOMEN IN SAGAMU LOCAL GOVERNMENT AREA, SOUTH-WESTERN NIGERIA: A COMMUNITY BASED STUDY

ABSTRACT

Introduction: Breast cancer is the leading female malignancy in the world and the second principal cause of cancer deaths in women worldwide. It has a poorer outcome among African-American women compared with the whites due to more advanced stage at presentation. This study therefore examines the factors influencing breast cancer screening awareness and practices among women in Ogun state, Western Nigeria.

Methods: This analytical cross-sectional study was conducted between April 22nd and 13th May, 2013. A multi stage cluster sampling technique was used to select the participants into the study. One participant per each household was selected into the study. A semi- structured questionnaire was used to collect relevant information.

Results: A total of 495 women were interviewed in this study, the mean age of the respondents was 36.45 years ranging from 19 to 63 years. Only 48.5% of respondents knew the commonest age group at risk of breast cancer and 59.4% knew breast cancer can be detected early. Majority [81.0%] were not aware of mammography and none of the respondents knew the age when regular screening should commence. One hundred percent of our respondents have never had mammography done for any reason whatsoever. Majority of respondents [85.0%] have never asked anyone about mammography.

25 Predictors of awareness of mammography were marital status [O.R= 1.61,
26 C.I=1.35-3.05], tertiary education [OR= 2.14 C.I=1.13-6.08] and Nuclear family
27 structure [OR=1.83, C.I=1.13-3.74].

28 **Conclusion:** This study revealed a low level of awareness of mammography and
29 mammographic screening. None of the respondents had ever undergone
30 mammography. Public education and awareness programs should be developed
31 to promote early detection and diagnosis in the prevention of breast cancer in
32 women in Nigeria and other developing countries.

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INTRODUCTION

Breast cancer is the leading female malignancy in the world accounting for 19% of all female cancers and the leading cause of cancer related death in women [1-2]. In 2010, nearly 1.6 million women worldwide were diagnosed with breast cancer, accounting for approximately 14% of the cancer deaths in women and 35% of all cancer cases. Nowadays, the cancer is the second cause of death throughout the world [3,4]. The breast cancer is the most organ cancer among the women and the first cause of death among the women in the age of 40-45. [4].

Studies have shown increased incidence from African countries where low rates have previously been reported and an estimated world total incidence of 1.45 million would be expected by the year 2010 [5]. In the developing world, the increasing trend of disease is worrying which might be attributed to increased life expectancy, changes in lifestyle and urbanization, associated with higher breast cancer risk [1,6]. However, the detection of breast cancer in the developing countries is low in comparison to the developed countries,[7] because only 50% of cancers in such countries are detected [8-9]. The cases of breast cancer has been increasing about 2% since the year 1980. However despite its increase, the rate of the death caused by breast cancer has decreased in the past 40 years. This may be because of early detection and the existing treatments [9]. Recent global cancer statistics indicated that breast cancer incidence is rising at a faster rate in populations of developing countries [10-11]. Several studies reported that breast cancer is the most common cancer, and is the principal cause of cancer deaths in women and is therefore a world concern [12-19]. Early detection of breast cancer plays an important role in decreasing its morbidity and mortality.

The peak incidence of breast cancer in Nigerian and African women is about a decade earlier than in Caucasians, and about 57% of breast cancer cases in Nigeria occur in women under 50 years of age [20-21]. Thus, this disease remains an important public health problem. Breast cancer is increasing in incidence even in regions that have until recently had low incidences of the disease. Breast cancer incidence at the Ibadan Breast Cancer Registry was 52.0 per 100,000 while it stood at 64.6 per 100,000 at Abuja Breast Cancer Registry. The five-year breast cancer survival rate in Nigeria is less than 10%, compared with over 70% in Western Europe and North America [20].

It has been observed that breast cancer has a poorer outcome among African-American women compared with the whites due to more advanced stage at presentation and this same trend has been reported among Nigerian women, as late presentation has been reported as the hallmark of breast cancer in this population[6-8,20]. If discovered early breast cancer can usually be cured; however, early detection through screening is the only way to reduce mortality [21]. Various risk factors for breast cancer have been reported, and this include; increasing age, hormone replacement therapy (HRT), high dietary fat, excessive alcohol consumption, smoking and family history among others [8-10]. The importance of knowledge of these risk factors and the need for every woman to be aware of the need for surveillance on her breasts and the various ways to do this cannot be over emphasized [15-17, 22].

Several studies have concluded that mammograms reduce mortality from breast cancer by a relative amount of 15%. It has a false negative rate of 10%. For the average woman, it is recommended by the US Preventive Services Task Force that

mammography should be every two years in women between the ages of 50 and 74 [5,6]. The largest study of the radiation risk from mammography concluded that the risk was insignificant in women above 40 years but greater in younger women. Although mammography remains the best diagnostic tool in the detection of breast cancer it is not routinely performed in Nigeria and other developing countries in Africa because of cost, high technology equipment and expertise required [5-6].

The predominant feature of late presentation of breast cancer had been reported over three decades in Nigeria and other African countries [18-20]. This is probably due to the fact that there is no established national screening program for breast cancer. In an environment where late presentation is predominant and where most breast cancers were detected accidentally by women themselves, there is an urgent need for this study which examines the awareness of breast cancer screening and practices among women in Ogun state, Western Nigeria.

METHODOLOGY

Background of the study area

The study was conducted in Sagamu local government area (SLGA) Ogun state, which is located in the South Western part of Nigeria. Sagamu local government area is one of the 20 local government areas in Ogun state. It was carved out of the former Ijebu Remo local government in 1991 and has a total land area of 68.03 km². It is bounded on the west by the Obafemi Owode local government area, on the east by both Ikenne and Odogbolu local government areas and also shares a boundary with Ikorodu local government area of Lagos state in the south.

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107 According to the 2006 census, the area has a population of 253,412 inhabitants
108 which consists of mainly remo-speaking people of Ogun state. Other ethnic
109 groups like the Hausas, Igbos and the Benue people are well represented. Most of
110 the towns are either semi-urban or rural. Other major towns in the local
111 government besides Sagamu include Ogijo, Sotubo, Ode-lemo, Emuren and
112 Simawa. The local government has 15 political wards, 12 of which fall within the
113 Sagamu metropolis. This area is a major transit region between the southwest,
114 southeast and the northern part of Nigeria [22-23].

115

116 **Study design**

117 This analytical cross-sectional study was conducted between April 22nd and 13th
118 May, 2013. A multi stage cluster sampling technique was used to select the
119 participants into the study. One participant per each household was selected into
120 the study. A semi- structured questionnaire was used to collect relevant
121 information.

122

123 **Sampling size**

124 The minimum sample size required for the study was 444 based on
125 mammography awareness rate of 40.5%, using the formula for sample size
126 determination for a cross-sectional descriptive study.

$$127 \quad N = \frac{Z^2 pq}{d^2}$$

$$128 \quad d^2$$

129 **Where**

130 **N= minimum sample size required**

131 $Z = \text{constant; a confidence level of } 95\% = 1.96$

132 $p = \text{measure of prevalence or proportion of event in } \% = 40.5\% = 0.405$

133 $q = \text{opposite of } p = 1 - p = 1 - 0.405 = 0.595$

134 $d = \text{precision value (95\% confidence interval)} = 0.05$

$$\text{Therefore, } N = \frac{1.96 \times 1.96 \times 0.405 \times 0.595}{0.05 \times 0.05} = 370.3$$

$$20\% \text{ non-respondent value} = \frac{20 \times 370.3}{100} = 74.1$$

$$\text{Add } 20\% \text{ non-respondent value; } 370.3 + 74.1 = 444.4$$

Hence, minimum sample size = **444**

143 Sampling procedure

144 Multistage cluster sampling technique was used to obtain a representative
145 sample of the communities in Ogun State [21-23].

146 • Stage 1: Using a sampling frame of all the local government in Ogun State,
147 Sagamu local government area was selected by simple random sampling.

148 • Stage 2: Sampling frame of all the communities in Sagamu local government
149 areas was drawn. The community where the study was carried out was selected
150 by simple random sampling (balloting). The community selected was Ilaye
151 community.

152 • Stage 3: Using the major road the community was divided into 4 clusters and
153 one cluster was selected among the 4 clusters identified. All houses in the cluster
154 selected were visited.

• Stage 4: Any resident aged 18 years and above available at the time of visit who has resided in the area for at least 6months in each household was interviewed in the houses selected.

Data collection

One participant per household who consented to take part in the study were interviewed using a structured questionnaire, which was administered by a trained interviewer. The interviewers were all medical students rotating through the Community Medicine and primary health care department of the Olabisi Onabanjo University Teaching Hospital during the period of the study and one resident doctor. All participants were interviewed individually over a 10 to 15minute period in a language they can understand. Completed questionnaires were scrutinized on the spot and at the end of the daily field sessions for immediate correction of erroneous entry. Similar methods have been used in previous researfhches by the author [22-24]

The instrument used was a structured questionnaire consisting of 2 parts, namely sociodemographic section (Section A), and factors associated with breast cancer screening (Section B). Section A includes information on socio-demographic data such as age, marital status, religion, employment status, ethnic group and educational status. While section B includes information on detailed past medical history, family and social history and reproductive health issues and issues on awareness, attitude and practice regarding mammography for breast cancer screening.

The questionnaire was pretested among 20 individuals in Ikenne local government, a nearby local government to the study area. Appropriate adjustments were then made to the questionnaire to improve its internal validity.

Ethical consideration

Ethical clearance was obtained from the Olabisi Onabanjo Teaching Hospital Ethics Board. Confidentiality on respondents' information was maintained. The purpose, general content and nature of the study were explained to each respondent to obtain verbal and written consent before inclusion into the study.

Data analysis

The data were coded and entered into a computer database using SPSS 15 statistical software. Percentages or means and standard deviation were computed for baseline characteristics of women interviewed. The data analysis focused on univariate frequency table and bivariate cross tabulations that identify important relationships between variables. Respondents were categorized into low and high socioeconomic status using location of resident as cut off.

The relationships between variables were examined through bivariate analysis, by computing odds ratio at 95% confidence level and chi squared and t-tests where appropriate. Predictor variables were restricted to outcome measures that were statistically significant. A $p\text{-value} \leq 0.05$ or confidence limits which did not embrace unity (1) was considered as statistical significance.

204

205 **RESULTS**

206 **Socio-demographic Characteristics of Respondents**

207 A total of 495 women were interviewed in this study, there was 100% response.
208 The mean age of the respondents were 36.45 ± 5.12 years, ranging from 19 to 63
209 years. Half [57.5%] of the respondents had tertiary education, 5.4% had no formal
210 education, 12.8% had only primary education, while 24.3% had secondary
211 education.

212 Those employed in unskilled settings were 49.4%, semi-skilled 12.1%, skilled
213 25.4%, unemployed 10.0% , and 3.2% of respondents were professionals.
214 Majority [68.0%] were married, 26.3% were never married, 1.0% were divorced
215 and 4.7% were separated. Furthermore, 85.3% were in a monogamous marriage
216 while 14.7% in a polygamous marriage. Most [71.1%]of the respondents were
217 Christians, 27.3% were Muslims while 1.6% were traditional religion
218 worshippers. Multiparous women made up 48.1% of the respondents,
219 Primiparous women 35.2% and nulliparous women 16.8% . This is shown in Table
220 1 & 2.

221 **Breast Cancer Knowledge of Respondents**

222 Most of our respondents [63.0%] agreed that breast cancer is the leading female
223 cancer, 8% disagreed while 27% didn't know. About half [54.6%] of the
224 respondents didn't know if both male and females were affected, 25.7%
225 disagreed both sexes were affected while only 19.6% knew that both sexes were
226 affected. Of the respondents that agreed that both sexes were affected, 97.6%

227 rightly said females were more affected compared with 2.4% that said males were
228 more affected.

229 Only 48.5% of respondents knew the commonest age group at risk of breast
230 cancer [45-55yrs], 9.3% disagreed while 42.2% didn't know. On early detection
231 59.4% knew breast cancer can be detected early, 33.3% didn't know while 7.3%
232 said it cannot be detected early. 77.4% didn't know if contraceptive use was a risk
233 factor for breast cancer, 11.3% agreed it was a risk factor while 11.3% disagreed it
234 was a risk factor. Breast feeding is protective against breast cancer but majority
235 65% didn't know this while only 23.7% were aware and 11.4% disagreed.

237 **Breast Cancer Screening Awareness of Respondents**

238 Majority at 81.0% were not aware of mammography, while 19.0% were aware. Of
239 the respondents that were aware of mammography, another majority 66.6%
240 didn't know on what principles it was based, only 28.6% correctly knew it was
241 based on X-rays while 4.8% wrongly said it was based on ultrasonography. None
242 of the respondents knew the age when regular screening should commence
243 which is 50 years and above, 42.9% thought it was between the ages 30-39 years,
244 28.6% replied as below 30 years, 19.0% didn't know while 9.5% thought it was
245 between ages 40-49 years.

246 Only 4.8% of the respondents correctly knew that mammography should be
247 performed every 2-3 years, 52.4% reported annually, 28.6% twice a year while
248 14.2% didn't know. Majority [71.4%] correctly knew it was used to detect cancer,
249 23.8% thought it was used to prevent cancer while 4.8% didn't know what it was

used for. About 65.0% of respondents didn't know if the procedure was painful, 20.0% reported that it was painful while 15% reported that it was not painful. Mammography is both a screening and diagnostic tool and 45.0% agreed to this, 30.0% reported that it was only a screening tool, 20.0% reported that it was only a diagnostic tool while 5.0% didn't know.

Breast Cancer Screening Practices

One hundred percent of our respondents have never had the procedure done for any reason whatsoever. Majority [85.0%] of the respondents have never asked anyone about the procedure and only 15.0% have ever asked someone.

Most [85.0%] of the respondents didn't know the cost of the screening while 15.0% thought the procedure was too expensive. No exact amount was asked from our respondents. Half [52.6%] of the respondents didn't know any center where the procedure was carried out while 47.4% knew where the service was offered. Most [90%] of the respondents believe mammography was necessary while only 10% believe it was not.

Mammography is not harmful when carried out on the appropriate age group and right interval, but 50.0% of respondents thought mammography was harmful, 30.0% didn't know if it was harmful while only 20.0% knew it wasn't harmful. Also of those aware of the procedure, only 25.0% have ever given a talk about it while 75.0% of those aware of the procedure have never given a talk to anyone about it. The mass media was the source of information for 75.0% of the respondents, 20.0% got their information from seminars while only 5.0% read about it in books.

Factors Influencing Awareness of Mammography Screening

There was a statistically significant difference in the awareness of mammography among respondents with high educational level [$\chi^2=24.16$, $p=0.0001$], Monogamy family background [$\chi^2=6.29$, $p=0.04$] and marital status [$\chi^2=44.95$, $p=0.0001$] and the occupation of the respondent [$\chi^2=23.4$, $p=0.0001$]. The gravidity of the respondent [$\chi^2=2.28$, $p=0.32$], age [$\chi^2=10.65$, $p=0.60$], religion [$\chi^2=0.52$, $p=0.77$] and smoking status [$\chi^2= 3.99$, $p=0.14$] were not statistically significantly associated with the awareness and use of mammography. This is shown in Table 1 & 2.

In the multiple logistic regression models, three variables were found to be independently associated factors for awareness of mammography. Predictors of awareness of mammography were marital status [O.R= 1.61, C.I=1.35-3.05], tertiary education [OR= 2.14 C.I=1.13-6.08] and Nuclear family structure [OR=1.83, C.I=1.13-3.74]. This is as shown in Table 3

DISCUSSION

This study revealed a low level of awareness of mammography and mammographic screening. In many findings, practice of awareness of early detection measures of breast cancer such as clinical breast examination (CBE), mammography and breast self-examination (BSE) was determined by the awareness of women having information about diagnostic methods of breast cancer [14,17,26-30]. The fact that the facility is not readily available or accessible could be the reason for the low awareness of mammography. Even where it is available, the high cost of the procedure may be a barrier particularly for women in resource-poor setting like Nigeria.

The knowledge of the respondents about breast cancer and its prevention in the study is inadequate with only 59.4% knowing that breast cancer can be detected early. This knowledge will affect the care seeking behaviour of the women and their attitude towards screening programmes. There have been many studies in Africa concerning clinical presentation of breast cancer among African women and late presentation has been observed in all the reports [5-6, 20]. This late presentation is directly related to the level of awareness about breast cancer, the risk factors and practice of the screening methods among these women. Government hospitals will need to establish breast imaging units and it would be necessary to include screening mammography in the national health insurance scheme as is practiced in developed countries. The participation of non-governmental and charitable organizations in creating awareness about breast cancer will also be helpful in solving these problems.

Predictors of awareness of mammography were level of education, marital status, and Nuclear family structure. Several studies have found out that Schooling and socioeconomic situation are among the factors that have been most strongly associated with the awareness or performance of mammography [31-32]. Although the discussion regarding the efficacy of the mammography has been constant in recent decades, the prevention programs for breast cancer should stimulate the initiation of mammographic screening in those at an appropriate age, and should promote measures to establish increased rates of adherence and repetition of the examinations. These study findings may serve as a useful source of information for researchers and those involved in public health programs.

None of our respondents ever had the procedure done for any reason whatsoever. This is in line with previous studies where an extremely low mammography practice of only 3.1% & 7.8% among health workers was found in similar studies in Nigeria, but in contrast with similar studies in Saudi Arabia (42.7%) and Singapore (35%) [33-36]. It has been noted in several studies that in terms of feasibility, the mammography screening method is inaccessible for many countries for financial reasons [37-38] and that most breast tumor has been diagnosed by breast self examination at the late stages of the disease [39-40]. This underutilization of mammography most likely results from a lack of awareness, financial constraints, scarce mammographic equipment and trained technicians to operate it and ineffective national breast health awareness programs. Although mammography remains the best diagnostic tool in the detection of breast cancer it is not routinely performed in Africa. Regular update courses for health workers on health maintenance practices are also recommended.

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342 The predominant feature of late presentation of breast cancer had been reported
343 over three decades in Nigeria and Africans [20-22]. This is probably due to the fact
344 that there is no established national screening program for breast cancer in most
345 of these countries. In an environment where late presentation is predominant
346 and where most breast cancers were detected accidentally by women themselves
347 there is an urgent need for awareness of breast cancer and its early detection
348 measures. Early diagnosis of breast cancer is known to be vital to the treatment of
349 the disease and the reduction in cancer deaths [41]. Breast self examination (BSE),
350 clinical breast examination and mammography has been recommended to reduce
351 breast-cancer-related deaths and diagnoses. Mammography is regarded as the
352 best method for the early diagnosis of breast cancer; however, it also may fail to
353 diagnose a tumor approximately 10% of the time, or it may give false positives
354 [42].

355

356 This study concludes that there is a low level of awareness of mammography and
357 mammographic screening in Nigeria. None of the respondents had ever
358 undergone mammography. Public education and awareness programs should be
359 developed to promote early detection and diagnosis in the prevention of breast
360 cancer in women in Nigeria and other developing countries.

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363 **Competing interests**

364 The authors declare that they have no competing interests.

365 **Authors' contributions**

366 AOE conceived the study theme, participated in the study design, conducted data
367 collection and prepared the final manuscript. TTO participated in the study design
368 and supervised data collection. FOK were involved in Data collection and analysis.
369 All authors read and approved the final manuscript.

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505 **Table 1: Socio-demographic Characteristics and awareness of Breast cancer**
506 **screening**

	Total No [%]	Awareness screening No[%]	of p-value
Age of Respondents			
<30 yrs	91 [18.2]	18 [19.1]	
31-40 yrs	211 [42.6]	31 [33.0]	0.60
41-50 yrs	127 [25.7]	29 [3.9]	
51-60 yrs	48 [9.7]	15 [16.0]	
>60 yrs	18 [3.6]	1 [1.1]	
Total	495 [100.0]	94 [19.0]	
Level of Education			
Nil	26 [5.4]	0 [0.0]	0.0001
Primary	62 [12.8]	5 [5.4]	
Secondary	118 [24.3]	14 [15.2]	
Tertiary	279 [57.5]	73 [79.3]	
Occupation			

Professional	15 [3.2]	1 [1.2]	0.0001 507
Semi- skilled	57 [12.1]	6 [7.0]	508
Skilled	135 [25.4]	15 [17.4]	509
Unskilled	233 [49.4]	62 [72.1]	510
Unemployed	47 [10.0]	2 [2.3]	511
Marital Status			
Single	131[26.3]	13 [13.7]	0.0001 512
Ever Married	364 [73.7]	81 [84.3]	513
Religion			514
Christainity	352 [71.1]	70 [73.7]	0.77 515
Islam	135 [27.3]	24 [25.3]	516
Traditional	8 [1.6]	1 [1.1]	517

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520 **Table 2: Other factors influencing the awareness of Breast cancer Screening**

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	Total	Awareness of	p-value
	No [%]	screening	
		No[%]	
Gravidity			
Nulliparous	83 [16.8]	11 [11.6]	0.319 ⁵²⁸
Primiparous	174 [35.2]	35 [36.8]	
Multiparous	238 [48.1]	49 [51.6]	
Family history			
Positive	58 [11.2]	16 [16.2]	0.098 ⁵³⁴
Negative	424 [86.2]	79 [83.8]	
Smoking			
Yes	22 [5.4]	6 [7.2]	0.13 ⁵³⁸
No	473 [94.6]	89 [92.8]	
Structure of family			
Monogamous	424 [85.3]	87 [91.6]	0.043 ⁵⁴²
Polygamous	73 [14.7]	8 [8.4]	

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546 **Table 3: Multivariate logistic Regression**

	Odds Ratio [C.I]
Level of Education	
Nil	1.00
Primary	1.34 [0.23-4.54]
Secondary	1.85 [1.02-2.30]
Tertiary	2.14 [1.13-6.08]
Occupation	
Unskilled	1.00
Semi- skilled	1.23 [0.65-2.11]
Skilled	0.87 [0.43-1.72]
Professional	1.25 [0.35-2.42]
Type of family	
Monogamy	1.83 [1.13-3.74]
Polygamy	1.00
Marital Status	

Ever Married	1.61 [1.35-3.05]	547
Never Married	1.00	