Breast Cancer Awareness, Knowledge and Screening Uptake among Female Secondary Schools Teachers in Owerri, Nigeria

Chinomnso C. Nnebue[1,2*], Uche M. Umeh[3], Prince C. Ekezie[4], Gift O. Ekeh[4], Augustine I. Ekpe[4] and Emmanuel C. Okodo[4]

[1]*Department of HIV Care, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria.*
[2]*Department of Community Medicine, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria.*
[3]*Department of Community Medicine, College of Health Sciences, Chukwuemeka Odumegwu Ojukwu University, Awka, Nigeria.*
[4]*Department of Community Medicine Madonna University, Elele, Nigeria.*

Authors' contributions

Article Information

Original Research Article	

ABSTRACT

Background: Teachers as key stakeholders play vital roles in the prevention and control of diseases and health-related conditions in schools and communities. Assessment of breast cancer awareness, knowledge and screening practices among them could improve intervention strategies.
Objective: To determine the breast cancer awareness, knowledge and screening practices among female secondary schools teachers in Owerri,, Nigeria.
Materials and Methods: This was a descriptive cross-sectional study of 284 female secondary

---

Corresponding author: Email: nnebnons@yahoo.com;

schools teachers in Owerri Nigeria selected by a multi-stage sampling technique. Data were collected using a pre-tested semi-structured self-administered questionnaire and were analysed with a statistical package for social sciences version 22.0. Statistical significance were identified using Fisher Exact and Chi-square tests at p value ≤ 0.05.

Results: Majority of respondents, 273 (96.1%) were aware of breast cancer. The key sources of information include: 111 (39.1%) health workers, 87 (30.6%) TV/Radio, The level of knowledge of breast cancer was poor, thus: 3(7.7%) aged 50-59; 8(3.3%) tertiary education attainment (p=0.000); 9(4.3%) currently married. Then, 236(90.1%) of them were aware of BSE, 199(70.1%), CBE and 120(42.3%), mammography. About 209(71.5%) reported ever practiced BSE (mostly the currently married (p= 0.021); 79 (27.8%), CBE and 45 (15.8%), mammography.

Conclusions: This study found overall high awareness, poor knowledge of breast cancer and poor screening uptake. We recommend periodic but sustained quality health education programs targeted at improving awareness, knowledge of breast cancer and screening uptake among these teachers.

1. INTRODUCTION

Carcinoma of the breast is the commonest malignancy in women worldwide and the second most prevalent cancer overall [1,2,3,4]. It accounts for 12% of all new cancers as well as a quarter (about 1.67 million) of all female cancers as at 2012 [2,5]. Breast cancer is also ranked the fifth most common cause of fatalities from cancer in women [1,2,4]. Recent data from the Ibadan cancer registry (IBCR) and the Abuja cancer registry (ABCR) both in Nigeria, suggest substantial increase in the incidence of breast cancer [6]. The age-standardised rate (ASR) for all invasive cancers from the IBCR was 130.6 per 100,000 women [6]. In the ABCR, it was 138.6 per 100 000 women. Generally, the Nigerian national incidence by ASR per 100,000 for breast cancer was 52 in IBCR and 64.6 in ABCR [6].

The etiology of breast cancer is multifactorial [7]. These risk factors include [7]: increasing age, female gender, race- more in Caucasian women, family history and genetic factors, personal health history, menstrual and reproductive history and certain genome changes. Also reported are environmental and lifestyle risk factors such as frequent consumption of alcohol, sedentary lifestyle with little physical activity, poor diet, having radiation therapy to the chest before the age of 30 years, taking combined hormone replacement, as prescribed for menopause, overweight or obesity, [7]. It should be noted that 60-70% of breast cancer cases have no link to these risk factors at all, while other people with risk factors will never develop breast cancer [7]. This underscores the need for early detection of cancer cases.

Breast cancer screening refers to examinations and tests used in presumptive detection of breast cancer in people who apparently do not have any symptoms [8,9]. Breast self-examination (BSE), clinical breast examination (CBE) and mammography are the most commonly known and used breast cancer screening methods in the world [8,10]. The American Cancer Society new guidelines for early detection of breast cancer recommend that women with an average risk of breast cancer- most women -should begin yearly mammograms at the age of 45 years. The guideline also states that women should be able to start the screening as early as age 40, if they want to [11]. It also recommends that women should see it as a good idea at age 40, to start talking to their health care providers about when they should commence screening; while at age 55, women should have mammograms every other year. However, women who want to keep having yearly mammograms should be able to do so for as long as they are in good health [11]. Breast exams, either from a medical provider or self-exams, are no longer recommended [11]. The guidelines are for women at average risk for breast cancer. Women at high risk- because of family history, a breast condition, or another reason – need to begin screening earlier and/or more often [11].The BSE had been recommended for women starting in their 20s [9]. Nonetheless, it remains the most readily available method of screening to women especially in rural areas where sophisticated screening methods like mammography are not easily available and also based on cost implications [12,13]. In Nigeria, there is no organized government screening policy, screening is thus offered at the request of patient/ client or health personnel.

Reports of recent studies have ignited intense discuss on whether the benefits of breast cancer screening programs are outweighed by the risks [14,15]. Even if mammogram is done routinely, once in every three years, it is also possible for a breast cancer to develop within the duration between one uptake and another (interval cancer) [16]. Breast screening cannot prevent breast cancer, but leads to early diagnosis, which is vital in the treatment of the disease as well as in determining prognosis [17,18]. Thus it is important to continue to be breast aware.

It is worrisome that though incidence rates of breast cancer are still highest in more developed climes (more than double the rates in Africa in 2012.), but as survival from the disease in less developed countries is poor, mortality is greater in sub-Saharan Africa [2,19]. Key factors linked to this disparity in incidence of breast cancer between these populations include: awareness, availability of organised and effective early detection programs and access to facilities for accurate and timely diagnosis and treatment of the disease [19,20,21]. These factors are lacking, while the time of detection is late in developing countries.

Stage at diagnosis is a key determinant of overall cancer outcome such as cancer mortality, prognosis, etc. [22,23] In sub-Saharan Africa, early-stage disease is associated with a better prognosis than late-stage disease [24,25]. Nonetheless, most patients with breast cancer in this region present with late-stage disease [22,26,27,28]. Though incidence increases with screening particularly in screening naïve populations, reductions in mortality may be most effectively achieved by diagnosing breast cancers before they progress to stage 4 [22], Also, with the double burden of diseases, developing countries are transiting through rapid societal and economic changes towards western lifestyles with a resultant rise in cancer rates [29]. Notwithstanding, there is a focus on competing health priorities such as HIV/AIDS, tuberculosis and malaria. [8,11]. Thus, strategies for early diagnosis of breast cancer should be regarded as a major priority by cancer control programs in sub-Saharan Africa.

In Nigeria, about two-thirds of women with breast cancer are diagnosed late [30], with mean ages of cancer diagnosis of 49.1 years in IBCR and 45.4 years in ABCR [6]. This has been linked to poor utilisation of screening facilities [30]. Studies have reported possible reasons for low participation in breast cancer screening among women. These include lack of knowledge about breast cancer [31,32] lack of awareness of the existence of such a screening test, its importance, cost and centers where such services are obtainable [20,21,33, 34,35]. Socio-demographic factors (age, educational level) [31], health behavioural factors (smoking, alcohol), psychological factors (fear, anxiety), religion, culture, forgetfulness and feeling of discomfort at touching the breast affect the uptake of breast cancer screening [33,34,35]. However, the knowledge and screening practices of this group in our study area have not been fully explored. Therefore this study was designed to determine the breast cancer awareness, knowledge and screening practices among female secondary schools teachers in Owerri, Imo state, Nigeria.

2. METHODOLOGY

2.1 Description of Study Area

This study was carried out in Secondary Schools in Owerri Municipal, one of the three local government areas (LGAs) that constitute Owerri the Capital of Imo State in South East Nigeria. The LGA had a land mass of 8km^2 and a population of 127,213 (males, females, adolescent girls) as at the 2006 census [36]. Owerri is a metropolitan city hosting several educational institutions ranging from the primary to the tertiary level. There are 14 registered private schools and 11 public secondary schools in the Municipality.

2.2 Study Design and Period

This was a cross-sectional descriptive study, conducted from August to October, 2017.

2.3 Study Population

This comprised female teachers in the registered secondary schools in Owerri municipal, Nigeria.

2.3.1 Inclusion criteria

Female teachers who were aged 20 years and above, teaching in the select registered secondary schools in Owerri municipal and those who gave consent to participate in the study were enrolled.

2.3.2 Exclusion criterion

Female teachers who were absent from school during the study period were excluded.

2.4 Sample Size Determination

The sample size was determined using the Leslie Kish's formula for single proportions which stated: [36] where, Z = standard normal deviate set at 1.96 which corresponds to 95% confidence interval., $n=Z^2pq/d^2$=150, p= percentage of awareness of breast cancer and breast self-examination among female secondary schools teachers in Enugu metropolis South-eastern, Nigeria by Aniebue and Aniebue [34] = 89% = 0.89, q= complementary prevalence (1-p) =1-0.89 =0.11, d= level of precision usually set at 0.05.

Then a conversion was done using the formula for the calculation of minimum sample size in populations less than 10,000 [37], nf= n /1+n/N, where N = target population= size of female secondary schools teachers in Owerri Municipal = 1200. Therefore, nf = 133 female teachers.

Anticipating a response rate of 90%, an adjustment of the sample size estimate to cover for non- response rate was made by dividing the sample size estimate with a factor f, i.e. n/f, where f is the estimated response rate [37]. Thus the calculated sample size =133/0.90 = 148 female teachers. However, to increase the statistical power of the sample size, we multiplied 148 by 2= 296 female teachers

2.5 Sampling Technique

Our study participants were selected in multi stages. The first stage involved the selection of Owerri municipal LGA out of the three LGAs in Owerri (Owerri West, Owerri North, and Owerri Municipal), using simple random sampling technique by balloting. The second stage involved grouping of the secondary schools based on ownership status into private and public secondary schools (10 private and 10 public) using stratified sampling technique and each selected school was considered a cluster, Thirdly, there was proportionate allocation of the sample size calculated to private (148 respondents) and public (148 respondents) secondary schools. Then, with the staff emolument register as the sampling frame and via simple random sampling technique by balloting, the eligible schools were picked and

every consenting female teacher was selected for the study until the required sample size was obtained.

2.6 Data Collection Technique

Data collection in this study was done using pre-tested, self-administered, semi-structured questionnaires developed from a review of relevant literatures. The questionnaire is divided into three sections (A-C) to obtain data on: A) socio- demographic characteristics of the respondents; B) awareness and knowledge of breast cancer, its risks, screening tests and barriers to the screening tests and C) uptake of breast cancer screening tests. All questions were written in English language and pre-tested on similar set of respondents at a Secondary School in Orlu, another Urban LGA in Imo state Nigeria. This was done, to check for the reliability, validity, appropriateness of format, wording and time needed to fill the questionnaire. Thereafter the instruments were reviewed by colleagues, necessary adjustments and corrections were effected before administering the questionnaire to the study participants. To ensure data quality, the data collection team was trained, and there was field monitoring of data collection. The study instruments were made available on time, while data collection team met at the end of every day to share experiences, submit completed forms and solve field problems.

2.7 Data Management and Analysis

The data were entered into the computer. Data cleaning was done by carrying out range and consistency checks. Knowledge of Breast cancer was measured by calculating the total score for positive responses on questions assessing knowledge with a total score of 18. Scores were graded on three levels: Good (15-18), Fair (11-14) and Poor (0-10). Data analysis was carried out using International Business Machine/ statistical package for social sciences (IBM/SPSS) Windows version 22.0. [38]. Descriptive data were presented as charts, simple frequencies and percentages. Statistical significance were identified using Fisher Exact and Chi square tests for proportions. A p value of $\leq$ 0.05 was considered significant.

3. RESULTS

Table 1 shows the sociodemographic charac-teristics of respondents. Two hundred and ninety six questionnaires were administered, out of

which 284 were returned and analysed, giving a response rate of 95.95%. The ages of respondents ranged from 20-62 years with a mean age of 39.1±9.1 .The modal age group (38%) was 30-39 years. Majority of them 266 (93.7%) attained tertiary level of education, 211 (74.5%) were married and 162 (57%) Christians of the Ronan catholic denomination.

Table 2 shows awareness, knowledge, risk factors and symptoms of breast cancer among respondents. Most of the respondents 273 (96.1%) were aware of breast cancer. The key sources of information on breast cancer include: 111 (39.1%) health workers, 87 (30.6%) TV/Radio, 46(16.5%) Friends. On general knowledge of breast cancer, 280 (98.6) posited thus: disease of young girls only, 259 (91.2%) abnormal growth of tissue in the breast, 245 (86.3%) breast cancer can be cured if diagnosed early. Only 111(39.1 %) had good knowledge. on risk factors, 172 (60.6%) cited smoking, 176 (62%) family history, while on symptoms of breast cancer 269 (94.7%), 157 (56.3%) and 138 (48.6%) cited breast lump, bloody nipple discharge and breast ulceration respectively.

Table 3 shows association between socio-demographic variables and level of knowledge of breast cancer among respondents. The level of knowledge of breast cancer was highest 3(7.7%) among those aged 50-59, 8(3.3%) among those that have attained tertiary level of education, 9(4.3%) among the currently married, and 7(4.3%) among the Roman Catholics. There was a statistically significant association between level of education and level of knowledge of Breast cancer (F=28.952, p=0.000).

Fig. 1 shows the awareness of BSE, CBE and mammography among respondents. Two hundred and thirty six (90.1%) of respondents had heard of BSE, 199(70.1%) were aware of CBE, while only 120(42.3%) had ever heard of mammography.

Fig. 2, shows uptake of breast cancer screening methods among respondents Two hundred and nine (71.5%) of respondents had ever performed BSE, 79 (27.8%) CBE and 45 (15.8%) mammography.

Table 1. Socio-demographic characteristics of respondents

Variables	Frequency(N=*284*)	Percent (%)
Age		
20-29	34	12
30-39	108	38
40-49	100	35.2
50-59	39	13.7
60 ABOVE	3	1.1
Highest level of education attained		
Primary	0	0
Secondary	17	6.
Tertiary	266	93.7
None	1	0.4
Marital status		
Never married	61	21.5
Currently married	211	74.5
Separated	5	1.7
Divorced	2	0.6
Widowed	5	1.7
Religion		
Roman catholic	162	57.0
Pentecostal	95	33.5
Islam	1	0.4
Others*	26	9.1

Others - Anglican, Methodist*

Table 2. Awareness, knowledge, risk factors and symptoms of breast cancer

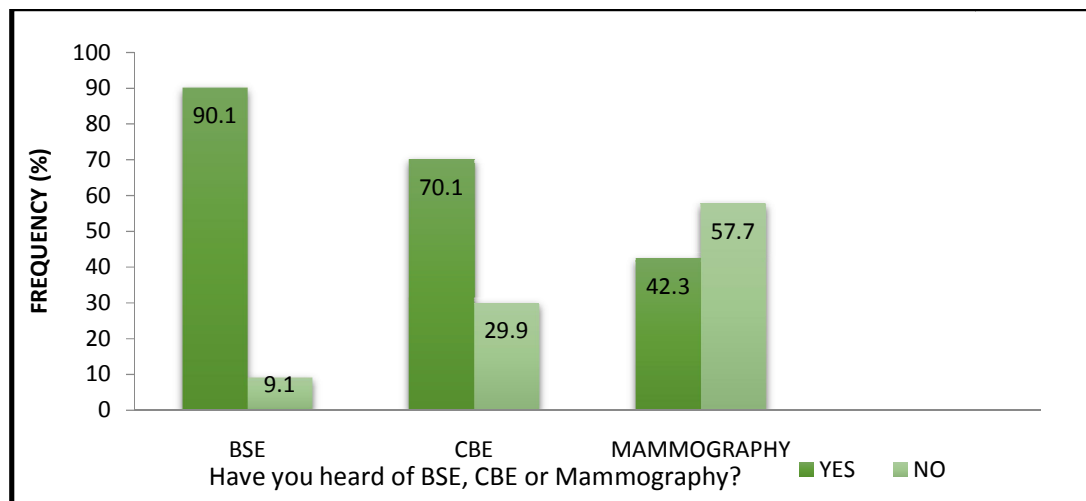| Variables		Yes Frequency (%)	No Frequency (%)
Awareness of breast cancer		273 (96.1)	11(3.3)
Source of information			
Health worker	111(39.1)		
Friends	46(16.5)		
Tv/radio	87(30.6)		
Print	12 (3.9)		
Internet	28 (9.9)		
General knowledge of Breast cancer			
Abnormal growth of tissue In the breast		259 (91.2)	25 (8.8)
Illness caused by ancestral curses		11 (3.9)	273 (96.1)
Disease of young girls only		280 (98.6)	4 (1.4)
Disease of old women only		9 (3.2)	274 (96.5)
Breast cancer can be cured if diagnosed early		245 (86.3)	39(13.7)
Breast cancer cannot be cured		28 (9.9)	256 (90.1)
Level of knowledge of Breast cancer			
Good	111(39.1)		
Fair	115 (40.5)		
Poor	158 (55.6)		
Risk factors of breast cancer			
Smoking		172 (60.6)	79 (27.8)
Family history of breast cancer		176 (62.)	75 (26.4)
Advanced age		63 (22.2)	187 (65.8)
Early age of menstruation(<12 years)		26 (9.9)	222 (78.2)
Women who have given birth		32 (11.3)	219 (77.1)
Late age at menopause (>55 years)		26 (9.2)	224 (78.9)
Symptoms of breast cancer			
Breast lump		269 (94.7)	1 (0.4)
Breast ulceration		138 (48.6)	136 (47.9)
Headache		71(25.)	203 (71.5)
Bloody nipple discharge		157 (56.3)	115 (40.5)
Inversion, pulling on the breast		105 (37.)	167 (58.8)
Abdominal pain		103 (36.3)	169 (59.5)

Fig. 1. Bar chart showing the awareness of BSE, CBE and mammography

Table 3. Association between socio-demographic variables and level of knowledge of breast cancer

Variables	Level of knowledge of breast cancer frequency (%)			Test statistic	p-value
	Good	Fair	Poor		
Age					
20-29	0(0)		16(41)	18(59)	F=8.538	0.383
30-39	6(5)		46(42.6)	56(51.9)		
40-49	2(2.0)		42(42.0)	56(56.0)		
50-59	3 (7.7)		10(25.6)	26(66.7)		
60 above	0(0)		1 (33.3)	2 (66.7)		
Level of education					
None	1 (100)		0(0)	0(0)	F=28.952	0.000*
Secondary	2 (11.8)		8 (47.1)	7 (41.2)		
Tertiary	8 (3.0)		107(40.2)	151(56.8)		
Marital status					
Never married	2 (3.3)		19 (31.1)	40 (65.6)	F=5.510	0.700
Currently married	9 (4.3)		91 (43.1)	111(52.6)		
Separated	0(0)		1 (20.0)	4 (80.0)		
Divorced	0(0)		1 (50.0)	1 (50.0)		
Widowed	0(0)		3 (6	2 (40.0)		
Religion					
Catholic	7 (4.3)		66 (40.7)	89 (84.9)	F=3.998	0.677
Pentecostal	4 (4.2)		35 (36.8)	56 (58.9)		
Islam	0(0)		0(0)	1 (100)		
Others	0(0)		14(53.8)	12 46.2)		

statistically significant; F=Fisher Exact Test

Table 4 shows association between socio-demographic variables and practice of BSE among respondents. The 30-39 years is the modal age group with respect to the practice of BSE 79(73.1). One hundred and ninety four (72%) of respondents had attained tertiary level of education, and there is statistically significant association between practice of BSE. Majority of the respondents who practiced BSE were the currently married 159(75)) and there is a statistically significant association between practice of BSE and marital status; (F= 11.595, p= 0.021). Though the Roman Catholics are the predominant religion, 120(74.) of them still formed the largest proportion of religious group that practiced BSE.

Table 5 shows association between level of knowledge and practice of BSE, CBE and mammography among respondents. There is no statistically significant association between level of knowledge of respondents and practice of BSE, CBE and Mammography (χ^2=5.427, p= 0.066: (χ^2= 0.669, p=0.716 and (χ^2= 3.757, p=0.153) respectively.

4. DISCUSSION

This was a cross sectional descriptive study that determined breast cancer awareness, knowledge and its screening practices among female secondary schools teachers in Owerri, Imo state. From this study, most (96.1%) of the respondents were aware of breast cancer. This finding is similar to those noted in studies done by Aniebue and Aniebue (88.8%) in Enugu, Nigeria [34] as well as Tobin and Okeowo (100%) in Okada Edo state Nigeria [39]. This finding is however contrary to that of a study by Omotara among rural women in Northeast Nigeria [40], which showed a low level of awareness of about 58.2%. This low awareness recorded in Northeast Nigeria, could be hinged on the differences in study methodologies as well as the socio- cultural differences where these females in the North are denied autonomy, contrary to their Southern counterparts.

From the index study, the key sources of information on breast cancer include: health workers, TV/Radio, Friends, which agrees with the findings of a study on breast cancer knowledge and screening practices among a similar population in Lagos Southwestern Nigeria [41]. This could be because the index study group reported high literacy level and are more likely to access health facilities and other sources of health information readily. Contrary to the findings by Aniebue and Aniebue [41], and Khadiga [42], where internet and print media
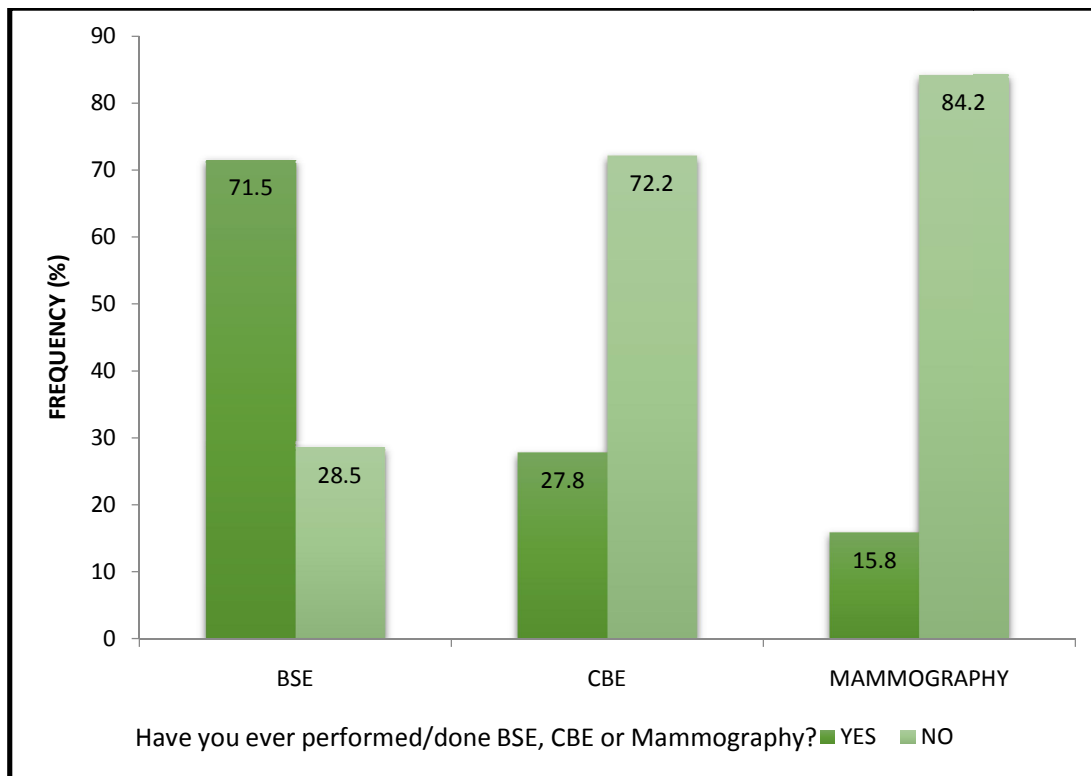
Fig. 2. Uptake of breast cancer screening methods

Table 4. Association between socio-demographic variables and practice of BSE

Variables	Practice of BSE frequency (%)		Test statistic	P-value
	Yes	**No**		
Age				
20-29	22(64.7)	12(35.3)	F= 2.978	0.561
30-39	79(73.1)	29 (26.9)		
40-49	69(69.0)	31 (31.0)		
50-59	30(76.9)	9 (23.1)		
60 above	3 (100)	0(0)		
Level of education				
None	1 (100)	0(0)	F=5.647	0.059
Secondary	8 (471)	9 (52.9)		
Tertiary	194(72)	72 (27.1)		
Marital status				
Never married	34(55.7)	27 (44.3)	F-11.595	0.021*
Currently married	159(75)	52 (24.6)		
Separated	5 (100)	0(0)		
Divorced	1 (50.1	1 (50.0)		
Widowed	4 (80.0)	1 (20.0)		
Religion				
Catholic	120(74.)	42 (25.9)	F=3.381	0.277
Pentecostal	64 (57.4)	31 (32.6)		
Islam	0(0)	1 (100)		

statistically significant; F=Fisher Exact Test

Table 5. Association between level of knowledge and practice of BSE, CBE and mammography

Variables level of knowledge	Frequency (%)		Test statistic	P-value
	Yes	No		
Practice of breast self-examination				
Good knowledge	10(4.9)	1(1.2)	$\chi2$=5.427	0.066
Fair knowledge	88(43.3)	27(33.3)		
Poor knowledge	105(51.7)	53(65.4)		
Practice of clinical breast examination				
Good knowledge	3 (3.8)	8(3.9)	$\chi2$=0.669	0.716
Fair knowledge	35(44.3)	80(39)		
Poor knowledge	41(51.9)	117(57.1)		
Practice of mammography				
Good knowledge	1 (2.2)	10(4.2)	$\chi2$=3.757	0.153
Fair knowledge	24(53.3)	91(38.1)		
Poor knowledge	20(44.4)	138(57.7.)		

were reported as the major sources of information, the current study noted these as the least reported sources. This could imply that there is a poor access of the internet or print media for health information, among teachers in our study area. Therefore, future health programs should aim at addressing possible hindrances to accessing the internet or print media for health information.

It has been documented that knowledge about breast cancer is an important determinant of uptake of breast cancer screening by women [32]. Lack of knowledge about breast cancer further causes delay in presentation, treatment and by extension morbidity and mortality. In this study only (39.1%) showed good knowledge on breast cancer. This could be attributed to the limited source of information (mainly health workers) reported, and would restrict information to only when the respondents come in contact with these health workers, probably to access care. Other major sources of information like Television; where health educational programs (soap operas and documentaries) might have been regularly displayed to them would have greatly improved their knowledge. This finding was similar to that of studies by Khadiga [42] and Ojewusi [43]. This study also showed a statistically significant relationship between level of education attained and level of knowledge of breast cancer. This implies that the higher the level of educational attainment the teacher has, the higher the probability of having a better knowledge of breast cancer. Hence, a more direct approach would be best applied to enhance their knowledge and by extension the

knowledge of their female students so as to equip them with adequate information should the need arise.

In this study, most (90.1%) of the respondents are aware of BSE. This result is in keeping with reports from another study [34]. This may be because there is increased sensitization and mass campaign programs on BSE by health workers and broadcasting media (TV/Radio) in Owerri, Imo state. On the contrary, different results were documented in some other studies [35,44]. Among the Teachers, (71.5%) had ever practiced BSE, and this was higher than the figures reported by other studies [34,41,42,43].

More than half (70.1%) were aware of CBE as a screening method. Since health workers was the major source of information on breast cancer, it probably explains the high awareness of CBE in this study. Similarly, Ojewusi revealed that more than half (53.1%) of respondents were aware of CBE [43]. The high awareness of CBE reported by our study was not matched by practice, as our study results revealed low practice of CBE (27.8%) of them had ever gone for CBE. Our finding was similar to the 23% in a study in Turkey [44]. However, our study finding is higher than reports from studies in rural Northern Nigeria (11%) [35] and Ibadan Southwestern Nigeria (14%) [43].

Reports of the current study shows that while less than half (42.3%) of the respondents are aware of Mammography, Osime in their study among civil servants, found an awareness level

of about 35% [45]. From the index study, of all the teachers who were aware of Mammography as a screening method, only 15.8% had ever gone for a mammogram. This was higher than the (4.8%) reported by Ojewusi [43]. Okobia reported that none of the participants ever had a mammography screening [20].

Some variables showed relationships between socio-demographic characteristics and practice of BSE. Marital status was statistically associated with BSE practice. Breast Self- Examination was practised most among women who were currently married and least among those who were never married. This was also noted in Delta state by Eguvbe et al. [46] and in Lagos state by Nasiru and Odusanya [47].

5. CONCLUSIONS

This study has revealed an overall poor knowledge of Breast cancer among female Secondary School Teachers in Owerri, Imo state despite a high level of awareness. The study also noted a high level of awareness and practice of Breast Self-examination, contrary to the picture in other screening methods- CBE and mammography.

6. LIMITATIONS TO THE STUDY

This study is based on self-reported health seeking behaviors, and the data is therefore subject to reporting errors. This we overcame by using anonymous questionnaires and ensuring the teachers that their answers would be strictly confidential and strictly for research purposes. This study did not set out to find and or compare differences in the results between private and public schools. However, it is a fact that we would like to recommend for further studies.

7. RECOMMENDATIONS

The findings of this study may have implications for improved awareness of breast cancer and practice of screening methods. This should be targeted at both policymakers and the teachers. This is needed to effectively implement early detection as a means of reducing breast cancer mortality. We therefore recommend as follows: There should be regular comprehensive educational programs to increase sensitization should be directed towards female teachers in both public and private schools; Mammography services should be made available at a subsidized cost or made free for screening women greater than 35 years by the government and non- governmental organisations; Teachers should be encouraged to avail themselves of credible sources of information such as print media and internet to improve their knowledge on breast cancer and its screening methods; Teachers should be encouraged to screen for breast cancer using the CBE and mammography methods.

CONSENT

As per international standard or university standard, client's/ patient's written consent has been collected and preserved by the authors

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Globocan. Breast cancer estimated incidence, mortality and prevalence worldwide [homepage on internet]. Lyon-France: International Agency for Research on Cancer; 2012. Available:https://globocan.iarc.fr/old/Factsheets/cancers/breast-new .asp (Accessed on 07/06/18)
2. Breast cancer statistics/ World Cancer Research Fund International. Available:https://www.wcrf.org/int/cancer-facts-figures/data...cancers/breast-cancer-statistics (Accessed on 05/05/17)
3. Molah Karim SA, Ali Ghalib HH, Mohammed SA, Rahim Fataah FH. The incidence, age at diagnosis of breast cancer in the Iraqi Kurdish population and comparison to some other countries of Middle-East and West. International Journal of Surgery. 2015;13:71-5.
4. Hossain MS, Ferdous S, Henrike E. Karim-Kos. Breast cancer in South Asia: A

Bangladeshi perspective. Cancer Epidemiol. 2014;38:465-70.

5. Globocan. World Cancer report [homepage on the internet]. Lyon, France: International Agency for Research on Cancer; 2008.

   [Cited Aug 28th, 2016]

   Available:https://www.iarc.fr/en/media-centre/iarcnews/2011/globocan-prev.php
   (Accessed on 05/ 05/17)

6. Jedy-Agba E, Curado MP, Ogunbiyi O, Oga E, Toyin Fabowale T, Igbinoba F, Cancer incidence in Nigeria: A report. Population-based Cancer Registries Cancer Epidemiol. 2012;36(5):e271–e278.

7. Breast cancer causes/risks: Genetics, hormones, diet, & more.

   Available:https://www.webmd.com /breast-cancer/guide/what-causes-breast-cancer
   (Accessed on 05/05/17)

8. What is breast screening? - Macmillan Cancer Support.

   Available:https://www.macmillan.org.uk/...cancers.../breast-screening/what-is-breast-screening.ht
   (Accessed on 05/05/17)

9. Saslow D, Burke W, Smith RA, Leach MO, Lehman CD, Sawye KA, et al. American cancer society guidelines for breast cancer screening. Cancer Journal for Clinicians. 2007;57(2):75-89.

10. Dolinsky C, Hill-Kayser C, editors. Breast cancer: The basics [monograph on the internet]. Oncolink; 2012.

    [Cited Aug 28, 2016]

    Available:https://www.oncolink.org/cancers/breast/all-about-breast-cancer&sa=
    (Accessed on 05/05/17)

11. American Cancer Society. American cancer society releases new breast cancer guideline; 2013.

    Available:https://www.cancer.org/.../american-cancer-society-releases-new-breast-cancer-guideli
    (Accessed on 05/05/17)

12. Olowokere AE, Onibokun AC, Oluwatosin AO. Breast cancer knowledge and screening practices among women in selected rural communities of Nigerian Journal of Public Health & Epidemiology. 2012;4(9):238-45.

13. Aldridge S. Breast cancer detected via mammography has better outcome [homepage on internet].

    Available:www.healthandage.com/breast-cancer-detected-via-mammography   -has-better-outcome

    (Accessed on 05/05/17)

14. Raftery J, Chorozoglou M. Possible net harms of breast cancer screening: Updated modelling of Forest report. BMJ. 2011;343:d7627.

15. Loberg M, Lousdal ML, Bretthauer M, Kalager M. Benefits and harms of mammography screening. Breast Cancer Res. 2015;17:63.

16. Benefits and risks of breast screening Breast Cancer Care; 2012.

    Available:https://www.breastcancercare.org.uk › ... › Routine breast screening Review of breast screening

    (Accessed on 05/05/17)

17. El-Saghir NS, Adebamowo CA, Anderson BO, Carton RW, Bird PA, Corbex M, et al. Breast management in low resource countries (LRCs); consensus statement from the Breast Health Global Initiative. Pub Med. 2011;20(Suppl 2):s3-s11.

    DOI: 10.1016/j. breast.2011.02.006

18. Karim S. The incidence, age at diagnosis of breast cancer in the Iraqi Kurdish- 2015 Available:https://www.sciencedirect.com/science/article/pii/S1743919114009893
    (Accessed on 05/05/17)

19. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. Globocan 2012;v1.1, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No. 11 [Internet]. Lyon, France. International Agency for Research on Cancer; 2014.

    Available:http://globocan.iarc.fr

    (Accessed on 16/01/2015)

20. Okobia MN, Bunker CH, Okuofia FE, Osime U. Knowledge, attitude and practice of Nigerian women towards breast cancer: A cross sectional study. World Journal of Surgical Oncology. 2008;4(1):11.

21. Anyanwu SN. Temporal trends in breast cancer presentation in the third world. Journal of Experimental and Clinical Cancer Research. 2008;27(1):1-6.

22. Johnson S, Greenberg D, Peake M, Rous B. Stage at diagnosis and early mortality from cancer in England. British Journal of Cancer. 2015;112:S108–S115.

23. Walters S, Maringe M, Coleman P, Peake M, Butler J, Young N, et al. ICBP Module 1

Working Group. Lung cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the United Kingdom: A population-based study. 2004-2007. Thorax. 2013;68:551–64.

24. Kene TS, Odigie VI, Yusufu LM, Yusuf BO, Shehu SM, Kase JT. Pattern of presentation and survival of breast cancer in a teaching hospital in north Western Nigeria. Oman Med J. 2010;25:104-7.

25. Kantelhardt EJ, Zerche P, Mathewos A, Trocchi P, Addissie A, Aynalem A, et al. Breast cancer survival in Ethiopia: A cohort study of 1070 women. Int J Cancer. 2014; 135:702–9.

26. Mabula JB, McHembe MD, Chalya PL, Giiti G, Chandika AB, Rambau P, et al. Stage at diagnosis, clinicopathological and treat-ment patterns of breast cancer at Bugando Medical Centre in north-western Tanzania. Tanzan J Health Res. 2012;14:269–79.

27. Basro S, Apffelstaedt JP. Breast cancer in young women in a limited-resource environment. World J Surg. 2010;34:1427–33

28. Ezeome, ER. Delays in presentation and treatment of breast cancer in Enugu, Nigeria. Niger J Clin Pract. 2010;13:311–6.

29. Nnebue CC. The epidemiological transition: Policy and planning implications for developing countries. Niger J Med. 2010; 19(3):250-6.

30. Akarolo-Anthony SN, Maso LD, Igbinoba F, Mbulaiteye SM, Adebamowo CA. Cancer burden among HIV-positive persons in Nigeria: Preliminary findings from the Nigerian AIDS-cancer match study. Infect Agent Cancer. 2014;9(1):1.
    DOI: 10.1186/1750-9378-9-1

31. Akinola R, Wright K, Osunfidiya O, Orogbemi O, Akinola O. Mammography and mammographic screening: Are female patients at a teaching hospital in Lagos, Nigeria aware of these procedures? Diagnosis Interv Radiology. 2011;17(2): 125-9.

32. Akpo EE, Akpo MO, Akhator A. Breast cancer knowledge and screening practice among Nigerian medical students. Internet Journal of Health. 2010;11(2):1-8.

33. bu-Helalah MA, Alshraideh HA, Al-Sherhan AA, Kawaleet M. Knowledge, barriers and attitudes towards breast cancer mammography screening in Jordan. Asian Pacific Journal Cancer Prevention. 2015;16(9):3981-90.

34. Aniebue P, Aniebue U. Awareness of breast cancer and breast self-examination among female secondary school teachers in Enugu metropolis South-western, Nigerian. Journal of College of Medicine. 2008;13(2):105-11.

35. Azubuike SO, Celestina UO. Breast cancer: The perspective of northern Nigerian women. International Journal of Preventive Medicine. DOI: 10.4103/2008-7802-172803.

36. Owerri Municipal.
    Available:www.wikipedia.org/wikiowerri_municipal
    (Accessed on 31 January 2015)

37. Araoye MO. Research methodology with statistics for health and social sciences. Nathadex Publications, saw-mill, Ilorin 2nd ed. 2008;115-22.

38. Statistical Package for Social Sciences (IBM SPSS) 22.0 version. Armonk NY: IBM United States. IBM Corp; 2013.

39. Tobin EA, Okeowo PO. Breast self-examination among secondary school teachers in South-south, Nigeria: A survey of perception and practice. Journal of Public Health Epidemiology. 2014;6(5): 169-73.

40. Omotara B, Yahya S, Amodu M, Bimba J. Awareness, attitude and practice of rural women regarding breast cancer in northeast, Nigeria. Journal of Community Medicine & Health Education. 2012;2:148.
    DOI: 10.4172/2161-0711.1000148

41. Odusanya OO. Breast cancer: Knowledge, attitude and practices of female secondary school teachers in Lagos, Nigeria. The Breast Journal. 2001;7(3):171-5.

42. Khadiga FD, Abdurrahman A. Knowledge, attitudes and practices surrounding breast cancer and screening in female teachers of Buraidah, Saudi Arabia. International Journal of Health Science. 2007;1(1):61-71.

43. Oyewusi A, Arulogun O. Breast cancer knowledge and screening practices among female secondary school teachers in an urban local government area in Ibadan. Nigeria. 2016;8(5):72-81.

44. Naim N. Breast cancer knowledge and screening behaviors of the female teachers

in Sivas-Turkey. Journal of Women's Health. 2010;50(1):37-52.

45. Osime OC, Okojie O, Aigbekaen ET, Aigbekaen IJ. Knowledge, attitude and practice of breast cancer among civil servants in Benin City, Nigeria. Annual African Medical Journal. 2008;7(4):192-7.

46. Egvube A, Akpede N, Arua N. Knowledge of breast cancer and need for its screening among female healthcare workers in Oshimili south Local Government council area of Delta state, Nigeria. African Medical Journal. 2014; 5(1):59-64.

47. Nasiru AI, Odusanya OO. Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria. BMC Cancer. 2009;9:76.