DOI: 10.21276/sajp.2017.6.2

Scholars Academic Journal of Pharmacy (SAJP) **ISSN 2320-4206 (Online)**
Sch. Acad. J. Pharm., 2017; 6(1): 4-15 **ISSN 2347-9531 (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublisher.com

Original Research Article

Knowledge and Awareness of Breast Cancer among University Students In South-South Nigeria

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Abstract: Breast cancer is a principal cause of cancer related deaths in women worldwide including Nigeria. Excellent knowledge and awareness of breast cancer will help to reduce the number of women who present at late stages of the disease when little or no benefit can be obtained from any form of treatment. This study assessed knowledge and awareness of breast cancer among university students in south-south, Nigeria. This cross-sectional, descriptive study was conducted from September 2014 to December 2014 among a convenience sample of 774 male and female students at two purposively selected universities in south-south Nigeria. A structured and pretested questionnaire with a reliability of 0.72 Cronbach's alpha which was self-administered was used for data collection. Data analysis was done using Statistical Package for the Social Sciences (SPSS) version 20. Level of significance was set 95%. 800 questionnaires were administered and 774 were completed and returned giving a response rate of 97%. There were a higher percentage of females (62.3%) than males (37.7%). All respondents (100%) had heard of breast cancer with radio (52.9%) and television (47.3%) respectively as the major sources of information. Level of knowledge and awareness of risk factors for respondents from Delta State University and University of Port Harcourt was poor (51.2%, 49.8%) respectively. For both universities, respondents had excellent knowledge and awareness of breast cancer symptoms (75.5%, 72.7% respectively); breast cancer prevention and treatment (89.2%, 87.8%) respectively; and breast cancer detection methods (94.0%, 93.5%) respectively. The study revealed excellent knowledge and awareness of breast cancer symptoms, breast cancer prevention and treatment and breast cancer detection methods, but poor knowledge and awareness of breast cancer risk factors among students of the two universities. Thus, there is need to organize more awareness campaigns particularly through electronic media to focus on breast cancer risk factors.
Keywords: Breast cancer, Knowledge, Awareness, Risk factors, University students, South-South, Nigeria.

INTRODUCTION

Breast cancer is the most common cancer and the principal cause of cancer related deaths in women worldwide as well as in Nigeria. Globally, about one million new cases are diagnosed annually; and the life time risk of developing breast cancer is at an incidence level of 1 in 9 [1, 2, 3]**.** Breast cancer survival rates on the other hand range from over 80% in North America, Sweden and Japan to around 60% in the middle income countries to below 40% in the low income countries**.** The low survival rates in these regions have been attributed to the lack of screening programs resulting in a high proportion of women presenting with late stage disease and lack of adequate facilities for their diagnosis and treatment [4, 5]**.**

The peak age of breast cancer in Nigerian women is about a decade earlier than Caucasians. Adebamowo and Ajayi [6] reported that the peak age of incidence in Nigeria is 42.6years and that 12% of cases occurred before the age of 30years while post-menopausal women accounted for 20% of cases. Furthermore, late presentation of breast cancer cases have been consistent for three decades and this late presentation of patients at late stages when little or no benefit can be obtained from any form of treatment is the hallmark of breast cancer in Nigeria [1, 6, 7]. Apart from African women being predisposed to the more aggressive forms of breast cancer, the disproportionately greater mortality rate compared to high resource countries can be attributed to a lack of public awareness of the disease, absence of organized screening programs and delayed treatment options;

however, breast cancer is curable if detected early. Early detection of breast cancer can be achieved through performance of breast self- examination (BSE), clinical breast examination (CBE) and mammography [8, 9, 10].

Male breast cancer is an uncommon disease accounting for approximately 1% of all breast cancers diagnosed in the United States each year. The presentation, investigation and treatment of male breast cancer are similar to that of female breast cancer [11, 12]**.** Breast cancer affects African women including Nigerian women and most university students are at a stage where it is important that they perform breast self-examination (BSE) regularly and potentially detect any changes early. However, breast cancer is preventable and prevention of the disease requires knowledge as well as awareness about it. Thus, if this knowledge and awareness is poor or inadequate, then it will be difficult for them to put into practice this potentially life-saving measure (BSE).Previously, most studies aimed at investigating the level of knowledge and awareness of breast cancer focused on females only and not much is known about the level of knowledge and awareness of breast cancer in men. This study includes both male and female participants because previous studies have shown widespread lack of knowledge of the disease among men. Even though breast cancer is not common in men, well informed men can play an important role in increasing awareness and knowledge among the general public [1, 7, 10, 13-17]. This study aimed to assess the level of knowledge and awareness of breast cancer among university students in South-South Nigeria on various aspects of the disease.

MATERIALS AND METHODS

Study design and setting

This was a cross-sectional, descriptive study conducted from September 2014 to December 2014 among seven hundred and seventy four (774) male and female university students within the age-range of 18-36years from various faculties of two universities namely Delta State University (DELSU), Abraka and University of Port Harcourt (UNIPORT), Choba, Rivers state both in South-South Nigeria. These two universities were selected purposively because they are both located in the Niger delta region of the South-South geopolitical zone of Nigeria. The Niger delta region is an oil rich region with many industrial and incessant crude oil exploratory activities which place people living there at high risk of cancer [18] including breast cancer.

Ethical Consideration

The objective of the study was explained to each participant; confidentiality and participant right to withdraw from the study was ensured. Informed verbal consent was obtained from each participant before data was collected. The data obtained were treated anonymously and confidentiality was maintained through anonymity.

Data Collection

The survey was carried out using a self-designed, structured questionnaire derived from the literature [1, 5, 10, 17, 19-29]; containing sixty items which were pre-tested for the purpose of the study. The questionnaires were self-administered to students who were selected by non-probability convenience sampling technique. The students were approached at various faculties of the two universities. For this study, participants who were less than 18years of age and those who were unwilling to participate were excluded.

The questionnaire was made up of seven sections denoted as sections A to G with section A dealing with socio-demographic characteristics, section B:basic knowledge of breast cancer, section C:general knowledge and awareness of breast cancer, section D: knowledge and awareness of breast cancer risk factors, section E: Knowledge and awareness of breast cancer symptoms, section F: Knowledge and awareness of breast cancer prevention and treatment and section G:knowledge and awareness of breast cancer detection methods. The reliability of the study instrument as a whole was found to be 0.72 Cronbach's alpha, thus within the acceptable range which makes it reliable for assessing breast cancer knowledge and awareness among university students. Out of a total of 800 questionnaires administered to respondents, only 774 were completely filled and returned, giving a response rate of 97%.

Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) software version 20 (SPSS Inc. Chicago IL, USA) for descriptive and inferential statistics. Independent samples t-test was used to compare the knowledge and awareness of breast cancer between students of the two universities. Results were considered statistically significant at 95% confidence interval (CI).
Results are presented in tables.

RESULTS

The results of the study were tabulated in the following order

- Socio-demographic characteristics of study participants
- Basic knowledge of breast cancer
- General knowledge and awareness of breast cancer
- Knowledge and awareness of breast cancer risk factors
- Knowledge and awareness of breast cancer symptoms

- Knowledge and awareness of breast cancer prevention and treatment
- Knowledge and awareness of breast cancer detection methods
- Matched-faculty comparisons
- Matched- gender comparisons
- Matched-age group comparisons

Socio-demographic Characteristics of Study Participants (Table 1)

The age-group of the sample (N=774) ranged from 18-24years, 25-30years to 31-36 years. However, majority (80.5%) of the respondents were within the age-range of 18-24years. Respondents from Delta State University (DELSU), Abraka consisted of 51.7% of the sample while respondents from University of Port-Harcourt (UNIPORT), Choba consisted of 48.3% of the sample. Male to female ratio was approximately 1: 2 for each institution indicating a greater percentage of females to males.

The mean age at menarche of respondents was found to be $13^{+}1.95$ years (Delta state university) and $13^{+}0.09$ years (university of Port Harcourt) respectively. However, only 19.2% of respondents from both universities had early menarche (those whose age at menarche fell within the age range of 8-11years).

Respondents' basic knowledge of breast cancer (Table 2)

All students (100.0%) had heard of breast cancer from varying sources especially from radio/television (52.9%, 47.3% for DELSU and UNIPORT respectively). Overall, for respondents from both universities seminars/schools and parents (0.8 % and 0.4%) respectively were the least sources of information.

Respondents' general knowledge and awareness of breast cancer (Table 3)

Average general knowledge and awareness for students of Delta State University, Abraka and University of Port-Harcourt, Choba was found to be excellent (78%, 78% respectively). Moreover, more than half of the respondents believed that breast cancer was peculiar to females (positive response > 60%).

Respondents' knowledge and awareness of breast cancer risk factors (Table 4)

Respondents from Delta State University and University of Port Harcourt were observed to have poor knowledge and awareness of breast cancer risk factors (51.2%, 49.8%) respectively. However, factors such as breast feeding, height (being tall), first live newborn after the age of 30years, ethnicity/race, being a woman, late menopause, high socio-economic status and never breast fed a child were factors believed by some respondents not to be potential risk factors for breast cancer (average positive response <40%).

Respondents' knowledge and awareness of breast cancer symptoms (Table 5)

Knowledge and awareness of breast cancer symptoms was found to be excellent for respondents of both Delta State University and University of Port Harcourt respectively (75.5%, 72.7%).

Respondents' knowledge and awareness of breast cancer prevention and treatment (Table 6)

Respondents of Delta State University and University of Port Harcourt respectively reported excellent (89.2%, 87.7%) knowledge and awareness on prevention and treatment of breast cancer with no significant difference (p>0.05).

Respondents' knowledge and awareness of breast cancer detection methods (Table 7)

Respondents from the two universities, Delta State University and University of Port Harcourt were observed to have excellent knowledge and awareness of breast cancer detection methods respectively (94.0%, 93.5%), with clinical breast examination as the highest (99.2%) and breast magnetic resonance imaging (<90%) as the least.

Matched-Faculty comparison using independent samples t-test (Table 8)

There was no significant difference in mean knowledge and awareness between faculties (p>0.05). However, respondents from faculties of Pharmacy and Basic Health Sciences (BHS)/Dentistry had the highest level of knowledge and awareness (>70%).

Matched-gender comparison using independent samples t-test (Table 9)

Male respondents from DELSU had a higher mean score (70.26+5.4) than their UNIPORT counterparts (68.81+3.85). This difference though, was not significant (p>0.05).

Matched-age group comparison using independent samples t-test (Table10)

Respondents in the age group of 31-36years had the highest level of knowledge and awareness, followed by those in the age group of 18-24years.

Table 1: Socio-demographic characteristics of study sample (N=774)

FEATURES		DELSU n (%)	UNIPORT n (%)	Total n (%)
Gender	Male	157(39.2)	135 (36.1)	292 (37.7)
	Female	243 (60.8)	239 (63.9)	482 (62.3)
Age-group (years)	18-24	317 (80.5)	298 (80.8)	615 (80.5)
	25-30	70 (17.8)	64 (17.3)	134 (17.6)
	31-36	7(1.8)	7 (1.9)	14 (1.8)
Faculty	Pharmacy	54 (13.5)	64 (17.1)	118 (15.2)
	Arts/Humanities	84 (21.0)	47 (12.6)	131 (16.9)
	Education	81 (20.2)	45 (12.0)	126 (16.3)
	Social sciences	54 (13.5)	21 (5.6)	75 (9.7)
	Science	77 (19.2)	98.(26.2)	175 (22.6)
	BHS/Dentistry	50 (12.5)	25 (6.7)	75 (9.7)
	Management sciences	-	31 (8.3)	31 (4.0)
	Engineering	-	20 (5.3)	20 (2.6)
	Agriculture	-	23 (6.1)	23 (3.0)
Academic year	First	94 (23.5)	95 (25.4)	189 (24.4)
	Second	86 (21.5)	95 (25.4)	181 (23.4)
	Third	90 (22.5)	82 (21.9)	172 (22.2)
	Fourth	82 (20.5)	83 (22.2)	165 (21.3)
	Fifth	43 (10.8)	19 (5.1)	62 (8.0)
	Postgraduate	5 (1.2)	-	5 (0.6)
Marital status	Single	399 (99.8)	374 (100)	773 (99.9)
	Married	1 (0.2)	-	1 (0.1)
Tribe	Delta	259 (64.8)	56 (15.0)	315 (40.7)
	Ibo	118 (29.5)	111 (29.7)	229 (29.6)
	Hausa	3(0.3)	7 (1.9)	10 (1.3)
	Edo	13 (3.2)	22 (5.9)	35 (4.5)
	Rivers	-	152 (40.06)	152 (19.6)
	Efik /Ibibio	-	13 (3.5)	13 (1.7)
Age at menarche (years)	8-11	40 (18.9)	46 (19.4)	86 (19.2)
Alcohol /smoking?	Yes No	38 (9.6) 359 (90.4)	106 (28.3) 268 (71.7)	114 (37.9) 627 (81.3)

N: sample size
n: number of response
BHS: Basic Health Sciences

Table 2: Respondents' basic knowledge of breast cancer

Questions		DELSU n (%)	UNIPORT n (%)	Total n (%)
Heard of breast cancer?	Yes	399 (100.0)	374 (100.0)	773 (100.0)
Source of information	Radio/TV	211 (52.9)	177 (47.3)	388 (50.2)
	Health worker	62 (15.5)	53 (14.2)	115 (14.9)
	Bulletin/Books	17 (4.3)	16 (4.3)	33 (4.3)
	Internet	50 (12.5)	40 (10.7)	90 (11.6)
	Seminar	4 (1.0)	2 (0.5)	6 (0.8)
	School	2 (0.5)	4 (1.1)	6 (0.8)
	Parent	1 (0.3)	2 (0.5)	3 (0.4)
	All sources	52 (13.0)	80 (21.4)	132 (17.1)

Table 3: Respondents general knowledge and awareness of breast cancer

Item	n of SA/A response		n of SD/D response		∑ of response to Item		% positive response (%)		p-value
	DELSU	UNIPORT	DELSU	UNIPORT	DELSU	UNIPORT	DELSU	UNIPORT	
Only females are affected by breast cancer	276	260	121	114	397	374	69.5	69.5	0.999
Breast cancer can be transmitted from one person to another	73	69	327	305	400	374	18.3	18.4	0.943
Breast cancer is a leading cause of death of women globally	366	347	32	26	398	373	92.0	93.0	0.574
Breast cancer can be detected early	359	330	38	41	397	371	90.4	88.9	0.500
Breast cancer is a major health problem in Nigeria	338	318	61	56	399	374	84.7	85.0	0.903
Breast cancer is on the increase	352	335	48	39	400	374	88.0	89.6	0.489
Average percent positive response for composite							**78**	**78**	**0.735**

n = number
SA/A: Strongly Agree/Agree, SD/D: Disagree/Disagree

Table 4: Respondents knowledge and awareness of breast cancer risk factors

Items	n of SA/A response		n of SD/D response		∑ of response to Item		% positive response		p-value
	DELSU	UNIPORT	DELSU	UNIPORT	DELSU	UNIPORT	DELSU	UNIPORT	
Family history of breast cancer	214	195	179	169	393	364	54.5	53.6	0.808
Cigarette smoking	399	374	-	-	399	374	100.0	100.0	-
Early menarche(<12years)	390	366	-	-	390	366	100.0	100.0	-
Breast feeding	140	131	254	237	394	368	35.5	35.6	0.985
Use of oral contraceptives	391	367	-	-	391	367	100.0	100.0	-
First live newborn after the age of 30years	113	90	281	278	394	368	28.7	25.1	0.188
Ethnicity/Race	116	103	273	261	389	364	29.8	28.3	0.648
Being a woman	147	124	244	240	391	364	37.6	34.1	0.312
Late menopause	119	106	271	258	390	364	30.5	29.1	0.67

(>55years)									6
Exposure to radiation	311	281	84	86	395	367	78.7	76.6	0.473
Being obese	190	182	207	192	397	374	47.9	48.7	0.823
High socio-economic status	87	79	308	292	395	371	22.0	21.3	0.806
Height (tall)	31	28	369	346	400	374	7.8	7.5	0.890
Never breast fed a child	153	138	240	228	393	366	38.9	37.7	0.728
Recent and long term use of menopausal hormone therapy containing estrogen and progestin	20	179	190	184	390	363	51.3	49.3	0.589
Number of	163	144	226	220	389	364	41.9	39.6	0.51
Two or more first degree relatives with breast cancer	209	187	180	175	389	362	53.7	51.7	0.570
Dense breasts (by mammography)	157	131	233	232	390	363	40.3	36.1	0.240
Biopsy (the removal of tissue, cells or fluids from the living body)	174	150	221	220	395	370	44.2	40.5	0.326
Certain inherited genetic mutations for breast cancer	274	274	119	120	393	367	69.7	67.3	0.473
One first degree relative with breast cancer	213	192	178	175	391	367	54.4	52.3	0.551
Average percent positive response for composite							**51.2**	**49.8**	**0.56**

Table 5: Respondents knowledge and awareness of breast cancer symptoms

	n of SA/A response		**n of SD/D response**		**∑ of response to items**		**% positive response**		**p-value**
Items	**DELSU**	**UNIPORT**	**DELSU**	**UNIPORT**	**DELSU**	**UNIPORT**	**DELSU**	**UNIPORT**	
Swelling of all parts of the breast	287	261	113	113	400	374	71.75	69.8	0.548
Skin irritation or dimpling	280	264	115	106	395	370	70.9	71.4	0.887
Breast or nipple pain	367	342	33	32	400	374	91.8	71.4	0.878
Nipple retraction	308	284	86	87	394	371	78.2	76.5	0.592
Redness of the breast, skin or nipple	318	291	74	76	392	367	81.1	79.3	0.527
Nipple discharge other than breast milk	318	291	74	76	392	367	81.1	79.9	0.527

Scariness of breast skin	297	284	95	83	392	367	75.8	77.4	0.599
Thickening of the nipple or breast skin	305	282	84	84	389	366	78.4	77.0	0.654
Painless breast lump	273	256	125	115	398	371	68.6	69.0	0.902
Lump under armpit	224	205	170	165	394	370	56.9	55.4	0.687
Average percent positive response for composite							**75.5**	**72.7**	**0.683**

Table 6: Respondents knowledge of breast cancer prevention and treatment

Item	**n of SA/A response**		**n of SD/D response**		**∑ of response to item**		**% positive response**		**p-value**
	DELSU	UNIPORT	DELSU	UNIPORT	DELSU	UNIPORT	DELSU	UNIPORT	
Staying at a healthy weight	335	311	65	63	400	374	88.8	83.2	0.824
Being physically active	355	331	45	43	400	374	88.8	88.5	0.914
Limiting alcohol intake	331	317	66	56	397	373	83.4	85.0	0.541
Regular breast screening	388	362	12	12	400	374	97.0	96.0	0.867
Chemotherapy (use of drugs)	316	292	80	79	396	371	85.2	78.7	0.709
Surgery (removal of lump in the breast)	371	347	29	27	400	374	92.8	92.8	0.987
Radiation therapy (x-ray)	338	309	59	60	396	369	85.4	83.7	0.537
Eating healthy foods.	370	347	30	27	400	374	92.5	92.8	0.881
Average percent positive response for composite							**89.2**	**87.7**	**0.783**

Table 7: Respondents Knowledge of breast cancer detection methods

Items	**n of SA/A response**		**n of SD/D response**		**∑ of response to item**		**% positive response**		**p-value**
	DELSU	**UNIPORT**	**DELSU**	**UNIPORT**	**DELSU**	**UNIPORT**	**DELSU**	**UNIPORT**	
Clinical breast examination (CBE)	388	362	3	3	391	365	99.2	99.2	0.933
Self-breast examination (SBE)	366	345	28	23	394	368	92.92	93.8	0.636

Mammography	374	344	21	26	395	370	94.7	93.0	0.325
Breast magnetic resonance imaging (MRI)	350	321	42	44	392	365	89.3	87.9	0.561
Average percent positive response for composite							**94.0**	**93.5**	**0.614**

Table 8: Matched-Faculty comparison using independent samples t-test

Faculty	**Mean % positive response (+SEM)**			
	DELSU	**UNIPORT**	**T**	**p-value**
Pharmacy	74.98+3.16	74.45+5.41	0.243	0.808
Education	66.94+3.70	66.11+3.60	0.155	0.877
Social Sciences	68.82+3.97	69.64+3.60	0.155	0.877
BHS /Dentistry	70.97+3.65	66.34+3.75	0.886	0.378
Arts/Humanities	64.69+3.96	64.98+3.90	0.052	0.958
Social Sciences	68.23+3.46	67.83+3.69	0.079	0.938

Excluded faculties of Engineering, Management sciences and Agriculture {Reason: Nil for Delta State University (DELSU) Abraka}.

Table 9: Matched-gender comparison using independent-samples t-test

Gender	**Mean % positive response (+SEM)**			
	DELSU	**UNIPORT**	**T**	**p-value**
Male	70.26+5.357	68.81+3.85	0.276	0.783
Female	67.46+3.58	67.21+3.57	0.048	0.962

Table 10: Matched-age group comparison using independent-samples t-test

Age-group	**Mean % positive response (+SEM)**			
	DELSU	**UNIPORT**	**t**	**p-value**
18-24	64.84+3.59	68.04+3.63	0.56	0.876
25-30	63.63+3.580	61.58+4.01	0.371	0.711
31-36	96.00+2.80	96.0+2.80	0.000	1.00

DISCUSSION

Students from two universities in South-South Nigeria, Delta State University, Abraka and the University of Port-Harcourt, Choba were assessed on their level of knowledge and awareness of breast cancer. However, breast health awareness is regarded as a practical and simple tool which can play a vital role in the detection of early breast cancers with a favorable prognosis [30]. The study is ideal for these university students because they are always eager to find out information about issues relating to them, hence a dreadful disease such as breast cancer should not be strange to them [31].

In this study, all students agreed to have heard of breast cancer (100%). This is also similar to previous studies where a substantial percentage of respondents agreed to have heard of breast cancer [7, 13, 32-36]. The study revealed that radio and television (electronic media) (52.9%, 47.3%) respectively were the major sources of information about breast cancer. This is similar to a study conducted among female nursing students in Palestine where it was reported that the major source of information was the mass media (57.6%) [31].The least reported source of information on breast cancer in this study was parents of the respondents (0.4%). This is similar to a study conducted among female nursing students in Palestine where only 3.4% of respondents agreed that their source of information for breast cancer were their relatives [31]. This may be due to the fact that some parents or relatives do not have adequate information on breast cancer and consequently, do not have enough information to discuss with their children or wards.

The study found that respondents from the two universities had excellent general/overall level of knowledge and awareness of breast cancer (78%). Though this study is in agreement with previous studies in which knowledge and awareness of breast cancer among respondents was reported to be good or excellent [33, 35-37]; it is in contrast to other previous studies such as the one carried out in Turkey by Dundar *et al*., in 2006 [38] and another study conducted among market women in southeast, Nigeria by Obaji *et al.*, in 2013 [39] in which the level of awareness of breast cancer and related aspects of the disease were observed to be poor.

However, a substantial percentage (69.5%) of the respondents believed that breast cancer was peculiar to females. This is similar to the study conducted in Malaysia among female university students where 85% of students erroneously believed that only females are affected by breast cancer [15]. This may be attributed to the fact that many students seem to be aware of breast cancer only among females.

This study also revealed that respondents knowledge and awareness that breast cancer can be detected early was excellent (90.4%, 88.9%) respectively for Delta State University, Abraka and University of Port Harcourt, Choba. This is consistent with a study conducted among women in Pakistan where 81% of participants were aware that breast cancer could be detected early [16]; and it is also in agreement with another study done in south-east Nigeria where 73.9% of participants thought that cancer could be treated if detected early [39]. This finding however, does not agree with the study conducted among Nigerian women by Okobia *et al* in 2006 [1] in which only 40% of respondents were aware that breast cancer could be detected early. This may be attributed to the fact that a long time has elapsed since that study was conducted and over the years, knowledge about breast cancer has improved.

A number of factors predispose an individual to breast cancer. Respondents from both universities, Delta State University, Abraka and university of Port Harcourt, Choba had poor knowledge and awareness of breast cancer risk factors (51.2%, 49.6%) respectively. However, this result is not in agreement with a study carried out in Warri, Nigeria among introductory clinical (medical) students in which the awareness of risk factors was rated as good (62.7%) [40]. Nonetheless, the result of this present study on knowledge and awareness of risk factors is similar to a study conducted among final year undergraduate nursing students in Johannesburg in which the respondents mean knowledge score for risk factors for breast cancer was 45%[41]. However, the reason for the poor knowledge of respondents in this study could be attributed to the fact that cancer which includes breast cancer is not perceived as an important health problem in developing countries where there is increasing trend in cancer prevalence including breast cancer, thus preventive strategies must take into cognizance the growing trend of risk factors for the development of this disease [42, 43]. Also, the poor level of knowledge and awareness on breast cancer risk factors could be due to ignorance.

However, all the respondents (100%) in this present study agreed that cigarette smoking is a risk factor for breast cancer. This is also similar to previous studies in which a substantial percentage of respondents identified cigarette smoking as a risk factor for breast cancer [17, 44-45]. This study also revealed poor knowledge and awareness (54.5%, 49.6%) of family history as a risk factor for breast cancer among respondents of Delta state university and university of Port Harcourt respectively. This is in agreement with other studies in which respondents knowledge of family history being a risk factor for breast cancer was poor [16, 21].

In this study, it was observed that a number of factors such as breast feeding, first live newborn after the age of 30years, ethnicity, race, being a woman, late

menopause, being obese, high socio-economic status and never breast fed a child were considered by these respondents not to be potential risk factors for breast cancer (average positive response < 40%).

Knowledge of breast cancer symptoms was found to be excellent for respondents of Delta State University and University of Port Harcourt respectively (75.5%, 72.7%). However, in a study conducted among introductory clinical (medical) students in Warri Nigeria, respondents' knowledge on symptoms of breast cancer was fair (67.8%) [40]; while in another study conducted among female university students in Ajman, United Arab Emirates [45], respondents had poor knowledge of breast cancer symptoms (45.9%).

This study also reported excellent knowledge of prevention and treatment of breast cancer with respondents from Delta State University slightly higher than their counterparts from University of Port Harcourt respectively (89.2%, 87.7%). This study showed that the respondents of the two universities respectively had excellent knowledge of surgery being a treatment option for breast cancer (92.8%, 92.8%) followed by radiation therapy (85.4%, 83.7%) and chemotherapy (85.2%, 78.7%). This is in contrast to the study conducted among Nurses in Addis Ababa, Ethiopia [46] where only 55.6% of respondents agreed that surgery is a treatment option followed by radiation therapy and chemotherapy (35.2%, 41.5%) respectively.

Early detection is the key to treatment. This study revealed that respondents from Delta State University and University of Port Harcourt had excellent knowledge of breast cancer detection methods (94.0%, 93.5%) respectively. The result obtained from a similar study conducted among female university students in Ajman, United Arab Emirates showed that the students also had excellent knowledge of breast cancer detection methods (86.5%) [45]. Breast self-examination scored 92.9% and 93.8% for respondent of each university respectively. This is similar to the study conducted in Addis Ababa, Ethiopia among nurses in which 74.8% of respondents had excellent knowledge of breast self- examination [46].

However, to enhance knowledge and awareness about breast cancer, the responsible bodies should design breast cancer awareness campaigns especially through the electronic media. The awareness campaigns should focus on disseminating information regarding breast cancer risk factors. Future studies involving students from other universities across the country and the general population should be conducted in order to appreciate the existing gap in knowledge and awareness about breast cancer.

LIMITATIONS

In this study, some students were not willing to fill out questionnaires, some questionnaires were not completely filled out and a few questionnaires also got missing as they were not returned immediately by some respondents. Moreover, this study was based on a non-probability sampling technique for the selection of a convenience sample of respondents; hence both selection and responder bias should not be ruled out. In addition, the study was conducted among students of only two universities in South-South Nigeria and therefore might not be representative of all universities across South-South Nigeria as well as the general population with respect to making inferences about the level of knowledge and awareness of breast cancer. The findings of this present study should therefore be interpreted with caution while bearing in mind its limitations.

CONCLUSION

Breast cancer continues to be a major public health problem in Nigeria. The study revealed excellent knowledge and awareness of breast cancer among students of Delta State University, Abraka and students of University of Port-Harcourt, Choba. The findings revealed that students from the faculties of Pharmacy for both universities were observed to be more knowledgeable and aware of breast cancer. This is followed by students from Basic Health Sciences/Dentistry. This is because students from these disciplines are medical/health science students, thus are better exposed to the right knowledge. There was no significant difference found between knowledge and awareness of breast cancer and gender therefore at the time of this study, female students were not significantly more knowledgeable and aware than male students about breast cancer. However, respondents from both universities had poor knowledge and awareness of breast cancer risk factors. Thus, there is need to organize more awareness campaigns particularly through the electronic media with more focus on breast cancer risk factors.

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