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The Effectiveness of Health Education on Knowledge Attitude and Practice of Breast Self-Examination among Secondary School Girls in Nnewi North Local Government Area, Anambra State, Nigeria

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ABSTRACT

Breast cancer is one of the most prevalent types of cancer in women, and its incidence is on the increase. Knowledge and practice of breast self-examination are important strategies for early detection of the disease. The general objective of this study was to determine the effectiveness of health education on breast self-examination amongst secondary school girls in Anambra State, Nigeria. It was a before and after interventional study with control, in which 261 school girls were selected by multi-stage sampling method. The study group (197) which received health education was assessed contemporaneously with the control (64) at the pre- and post-intervention stages. Data was collected via self-administered questionnaire. Before health education, questionnaires were administered to assess their baseline knowledge, attitude and practice of breast self-examination. The study group received information on breast self- examination, but the control group had health talk on the basics of hand washing technique. Questionnaires were administered again to both groups to assess the effectiveness of education on breast self-examination. Data was analyzed and presented in tables. Results Showed a significant increase in the percentage score for knowledge from 40.9% to 85% for the study group as opposed to the control group which percentage score remained unchanged at 47.1%. The attitudescores of respondents in both groups which were almost the same before education (93.4% and 87.5% respectively) before education, did not record significant changes following education (98% and 84.4% respectively).Overall the practice score reduced markedly from 67% to 39.6% among study group ($p<0.001$)but among those who continued BSE after education, significant improvements in specific practice item scores were recorded among them: (frequency- $p<0.01$; time- $p<0.001$; and place- $p<0.001$). The results demonstrated the effectiveness of education on the -knowledge, attitude and practice of breast self-examination among the students.

Keywords: Health education, Effectiveness, Breast Self-Examination, Knowledge, Practice

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INTRODUCTION

The adult female breast or mammary gland is a modified sweat gland that lies in the subcutaneous tissue of the anterior chest wall[1]. At birth and during childhood, it is not well developed in both sexes, however at puberty, the normal young female breast develops and this occurs as a result of hormonal changes[1]. Breast cancer is one of the most prevalent and aggressive cancers in women both in low and middle income countries. Its incidence in these countries is on the increase due to adoption of Western lifestyles[2]. Although its etiology is poorly understood, a variety of interrelated factors such as genetic, environmental and hormonal factors have been identified[3]. Several screening methods for early detection of breast cancer are available; mammography, breast examination by doctor or nurse, breast MRI, breast ultrasound and breast-self-examination. Breast self-examination (BSE) is a screening method used in an attempt to detect breast cancer early. The method involves the woman herself looking at and feeling each breast for possible lumps, distortions or swellings [4]. So many women feel this is important to their health. The best time to do a BSE is about 3 – 5 days after the onset of a woman menstrual period, at such point the breast is not tender or lumpy thus it's done once a month[5]. It can be done while in the shower, in front of a mirror or lying down usually from around the age of 20 years [6]. The technique can be explained as follows: while an individual is in the shower using the pads of her fingers, she moves around the entire breast in a circular pattern from outside to the center, checking the entire breast and armpit area feeling for any lump, thickening or hardened knot. If any changes are noticed, the individual gets them evaluated by her healthcare provider [6]. While in front of a mirror, the individual visually inspects both breasts with both arms on her sides. Next, her arms are raised high overhead. In doing this she looks for any changes in contour, swelling or dimpling of the skin, or changes in the nipples. Next the individual rest her palms on her hips and press firmly to flex her chest muscles. The left and right breast will not exactly match – few women's breast do, however the individual looks for any dimpling, puckering or changes particularly on one side[6]. When it is done lying down, the breast tissue usually spread out evenly along the chest wall, and then the individual places a pillow under her right shoulder and right arm behind the head, then using the left hand, and moving the pads of fingers around her right breast, she gently in small circular motions covering the entire breast and armpit. A light firm pressure is used. The nipple can then be squeezed to check for discharge. These steps are repeated for the left breast. There are few limitations to breast BSE one of which is excessive biopsies. This study is considered vital and justified because BSE can be a simple means through which early detection of a breast disease could be made. However, there is low level of awareness about BSE in our environment, and the few who probably

have some knowledge about it, may still not want to practice it. Female education is an important issue to be handled in every society; with this they can teach their children and also their mother. Other screening techniques especially mammography which remains the best and single diagnostic tool in detection of breast cancer is not routinely done in most developing countries like Nigeria due to low level of awareness, ignorance, cost and illiteracy. Also false negative is higher in the younger age group [7]. In addition, practice of BSE has been seen to empower women, making them take responsibility for their own health[2]. The objective of this study includes determining the effectiveness of an intervention following a baseline assessment of the knowledge; attitude and practice of BSE amongst secondary school girls in Anambra state, Nigeria.

MATERIALS AND METHOD

Study area:

Anambra state is a state in South-Eastern Nigeria. It is the eighth most populated in Nigeria. The state capital is Awka, the industrial center is at Nnewi, while the commercial center is at Onitsha. Nnewi as metropolitan city encompasses two local government areas Nnewi North and Nnewi South. Nnewi North is commonly referred to as Nnewi central. The study was conducted in two schools in Nnewi North local government area, which is one of the twenty-one local government areas in Anambra state, Nigeria.

Study population:

The study comprised of girls who attend these schools and the inclusion criterion was girls of senior secondary 1-3 (SS1- 3), because they were likely to fall within the age range of the study.

Study design:

It was an interventional study or a before and after study, whereby both study and control were conducted contemporaneously. The predictor was the health information disseminated while the outcomes were the envisaged changes in knowledge, attitude and practice of BSE.

Sample size:

Sample size: Sample size was determined using the formula:

$$\frac{\left\{U\sqrt{[\bar{\Lambda}_1(1-\bar{\Lambda}_1)+\bar{\Lambda}_2(1-\bar{\Lambda}_2)]}+V\sqrt{[\bar{\bar{\Lambda}}(1-\bar{\bar{\Lambda}})]^2}\right\}}{(\bar{\Lambda}_2-\bar{\Lambda}_1)^2} =$$

Where u = 1.28 (where proportion is 90%), v = 1.96 (where significant level is 5%),

$\bar{\Lambda}_1$ = Population before health education (taken as 30% [11]), $\bar{\Lambda}_2$= Proportion after health education.

$$\bar{\bar{\Lambda}} = \frac{\bar{\Lambda}_1+\bar{\Lambda}_2}{2} = \frac{30+40}{2} = 35$$

$$= \frac{\left\{1.28\ [30(1-30)+40(1-40)]+1.96\sqrt{[35(1-35)]^2}\right\}}{(40-30)^2} = 170.83 = 188 \text{ (with 10\% attrition).}$$

Sampling technique:

A multi-staged sampling method was used, of which simple random sampling method was used to choose the schools for both study group and control group and a stratified sampling method was used to choose the classes.

Data collection:

Data was collected via self-administered validated questionnaire. The questionnaire had sections on socio-demographic data; knowledge of breast cancer and BSE; attitude to and practice of BSE. Research assistants were trained to collect the necessary data at the control study area, while the researchers were at the study area to carryout the health education and data collection.

Study procedure:

Before education, questionnaires were administered to assess the baseline knowledge, attitude and practice of BSE from both groups. The study group was taught about BSE and issues regarding the sex that should perform BSE, the appropriate age it should begin, how often it should be done, where it should be done and practical technique of the procedures with the palm were handled. This was done twice, however areas that needed clarification by the students were clarified. In order to keep them occupied and for ethical reasons, the control group received one session education on hand washing technique. After education, questionnaires were administered again to assess the effect of education on BSE in the two groups.

Informed consent:

Consent was obtained from the students, teachers and principal of the school through the head of department of Community Medicine, Nnamdi Azikiwe University Teaching Hospital, Nnewi Campus.

Data analysis:

Data analysis was done both manually and by means of Microsoft Excel of the computer.

RESULTS AND DISCUSSION

A total number of 261 students participated in the study, from which 197 were the study population and 64 constituted the control population. Table 1 depicts the socio-demographic variables of the respondents. Majority of the respondents (63.0% for study population and 76.6% for control population), were within the age range of 14 – 16 years. The mean age and standard deviation for the study group were 16.11 and 2.39 years respectively, while for the control group the mean age and standard deviation were 15.23 and 2.09 years respectively. All (100%) respondents in both populations were Igbo, also all (100%) in both population were Christians and single. About 40% of the study population and 60.9% of the control population were in senior secondary 1 (SS1).

Table 1: Socio-demographic variable of respondents

Socio-demographic variables	Study Population		Control Population	
	Frequency Percentage	Percent	Frequency	Percent
Age (years)				
11 – 13	1	0.5	5	7.8
14 – 16	124	63	49	76.6
16 – 19	70	35.5	10	15.6
≥20	2	1.0	0	0.0
Ethnicity				
Igbo	197	100.0	64	100.0
Yoruba	0	0.0	0	0.0
Hausa	0	0.0	0	0.0
Others	0	0.0	0	0.0
Religion				
Christianity	197	0.0	64	100.0
Islam	0	0.0	0	0.0
Others	0	0.0	0	0.0
Marital status				
Single	197	100.	64 100.0	
Married	100.0	0	0 0.0	
Class				
SS1	79	38.0	39 60.9	
SS2	43	22.0	25 39.1	
SS3	75	40.0	0 0.0	

Table 2 shows the respondents knowledge of BSE before and after education. Most of the study population (89.3%) had heard of BSE, while 60.9% of the control group had heard of it. Among the study population 68.5% of them heard of it from medical students and 21.5% from television and radio, however for the control group 36.6% heard it from television and radio while 26.8% heard it from medical students. Before the intervention, 68% of the study population and 86% of the control group knew that BSE is practiced by female only, while after the education, the percentage for the study group significantly increased to 95.4% ($p<0.001$), while that for the control remained the same (86.0%). For the study population 18.3% and 18.8% of the control group are of the view that it should begin as from above 20 years, however after the intervention, while that of the study group markedly increased to 87.0% ($p<0.001$) that for control remained the same (18.8%). Before education about 51% of the study population and 68.8% of the control group felt it should be performed monthly, however after intervention that of the study group increased to 96.4% ($p<0.001$), while the control group remained 68.8%.Before education was carried out, 45.7% of the study population and 46.9% of control group were of the view that BSE is done after menses. Following education, that of the study population significantly increased to 97.5% ($p<0.001$). The 70% of the study population who said BSE should be done in front of mirror reduced to 52.8% after intervention control group while the control group remained unchanged. Before the education 33% of study group and 42.2% of control group knew it could be done with palm, but after intervention that of the study group appreciated significantly to 94.4% ($p<0.001$). On the whole, each correct answer was scored 1, while wrong answers were scored 0, this resulting to a total score of 483 with a percentage knowledge score of 40.9% for the study population before education, and 1005 with a percentage knowledge score of 85% after the education ($p<0001$). However that of control group remained as a total score of 180.9 with a percentage knowledge score of 47.1% both before and after. Table 3 shows the attitude of respondents towards BSE. Before education 193 of the 197 in study group and 54 0f the 64 in the control were of the view that BSE is important. Ninety-six percent of the study group and 85.9% of the control group felt that BSE can be used to screen for breast cancer. After education, 100% of the study group and 84.4% of the control group felt it was important to carryout BSE. About 99.5% of the study group and 85.9% of the control group were of the view that it be could be used to screen for breast cancer. All the changes in the study group following education were statistically significant ($p<0.05$, $p<0.001$ and $p<0.001$ respectively). Table 4 shows the respondents practice of breast self-examination (BSE). Before education, 67% of the study group and 46.9% of control group practice BSE, however after education, practice significantly reduced to 39.6% of the study group ($p<0.001$) but

remained 46.9% of control group who practiced BSE. Before the intervention, 46.2% of study group and 8.8% of control group were of the view that their reason for not practicing BSE was that they were not up to the age; however after education this increased markedly to 89.1% for the study group ($p<0.001$) but remained at 8.8% for control group. The age of the respondents ranged from 11 years to 20 years and above, with mean of 16.11+2.39 years and 15.23+2.09 years for the study group and control group respectively. Both groups were age matched ($p>0.05$) and the study was appropriate for the intended age of adolescence when they are yet to reach the age of common occurrence of breast cancer[8]. Most of the respondents stated that they had heard of BSE (89.3%) for the study group and 60.9% for the control group) and breast cancer (93.4%) for the study group and 87.5 for the control group). These impressive knowledge levels may have been due to the close proximity of medical school to the secondary schools. Similar observation was reported among female medical students in the University of Lagos, where 97.3% had knowledge of BSE and breast cancer [7]; among young Cypriot women[9,]and among female health workers in Isfahan[10]. However, result of study of senior secondary school girls from selected municipal areas in Abuja, Nigeria and a Sub-saharan university study[11] showed that they had poor knowledge of breast cancer and BSE[12]. The major source of information on BSE to the respondents was medical students. This finding is consistent with that of a study conducted among female medical students in Lagos, Nigeria, whose source of knowledge was probably due to the advantage of their proximity to source of health information[7]. Our result is however at variance with outcome of another study among Pakistan University students who cited television and hearsay as their most common sources of BSE information[13]. In this study, the overall percentage knowledge score significantly increased from 41% BSE before education to 85% after education for the study group, while that for the control group remained as 47.1%. Similar observations were made in a 'before and after' study without control, among female students of Udupi district, where 72.5% of student had average knowledge of BSE pre-test and 85% post-test, and the computed paired t-test showed that the planned teaching program was effective[14]. A good percentage of respondents (98.0% for the study group and 84.4% for the control group) showed positive attitudes towards BSE, and were of the view that it could actually be used to screen for breast cancer. This was however higher than the65.4% of female medical student respondents in the University of Lagos who believed that BSE was necessary [7], an indication that the level of concern about screening for breast cancer among these secondary school students was commendably high. Sixty-seven percent of the study group before education practiced BSE while 39.6% practiced it after education. This is a surprising result which on superficial appraisal gives the impression that the education

intervention produced a negative impact. The teaching is that BSE should commence at age 20 years and above. Unfortunately only a small proportion (1.0%) of respondents belonged to this age group. Therefore, the large percentage of respondents below the age of 20 years who hitherto practiced BSE pre-intervention now reverted to the right teaching post-intervention. Consequently, the smaller proportion of respondents who practiced BSE post-intervention (compared to pre-intervention) was an indication of effectiveness of the health education. This fact is further buttressed by the complete absence of change in the control group at post-evaluation. Furthermore, after education, about 89% of the study group cited the fact that they 'have not attained the age of 20' as the reason for not practicing BSE hence the low practice rate (39.6%) following education. This was at variance with the outcome of the Lagos study where 56.1% of medical students of University of Lagos started before the stipulated age[7]. It was however comparable to the39.0% of women in Port Harcourt Nigeria who practiced BSE only occasionally despite having 85.5% BSE awareness level[15]. An even much lower practice rate was recorded among the secondary school girls in Abuja, Nigeria where only 10.1% reported engaging in BSE[12], perhaps because they did not have the benefit of a health education intervention. It is also lower than the 50% rate reported for South African women[16] even though they were predominantly rural with low literacy level. Also an abysmally low practice rate of 18.1% was reported among female traders in Ibadan Nigeria[17]again probably because of lack of exposure to education. From the foregoing, there is little doubt that our health education intervention was very effective in positively improving knowledge attitude and practice of BSE among the respondents, the paradoxical fall in practice apparently due to compliance with the contents of the education, not with standing. Similar effectiveness of education on BSE was demonstrated in pre-test/ post-test study conducted among degree female students from selected colleges of Udupi district; and in this study, their knowledge scores on BSE improved significantly from 72.5% to 85%[14]. Similar results were obtained in another experimental study conducted among midwifery students from Halic University whose BSE knowledge level score increased from 43.2±10.6 to 68.4±10.5 after education ($p < 0.05$)[18]. Our study result is also in consonance with what was obtained among women in Bolu, Turkey who in a randomized control trial, displayed significantly better BSE knowledge following education from healthcare professionals, compared to those informed about BSE through other means such as television, radio and internet ($p<0.05$)[19].

Table 2: Knowledge of BSE by respondents

Knowledge BSE	Study Population		X^2, p-value	Control Population		X^2, p-value
	Before [n=197 (%)]	After [n=197 (%)]		Before [n=64 (%)]	After [n=64 (%)]	
Heard of BSE						
Yes	176 (89.3)	197 (100)	X^2=21.5	39 (60.9)	39 (60.9)	X^2=0
No	21 (10.7)	0 (0.0)	P<0.001*	25 (39.1)	24 (39.1)	P=1
Information source						
Home	2 (1.0)	2(1.0)		8 (19.5)	8 (19.5)	
Friend	17 (8.6)	3 (1.5)		7 (17.1)	7 (17.1)	
Television/radio	43 (21.8)	6 (3.0)		15 (36.6)	15 (36.6)	
Medical student	135 (68.5)	189 (94.5)		11 (26.8)	11 (26.8)	
BSE performed by						
Female	134 (68)	188 (95.4)	X^2= 50.9	55 (86.0)	55 (86.0)	X^2=0
Male	17 (8.6)	0 (0.0)	P<0.001*	2 (3.1)	2 (3.1)	P=1
Male and female	46 (23.4)	9 (4.6)		7 (10.9)	7 (10.9)	
Age to start BSE						
<20 years	161 (81.7)	25 (13.0)	X^2=188.3	52 (81.2)	52 (81.2)	X^2=0
>20 years	36 (18.3)	172 (87.0)	P<0.000*	12 (18.8)	12 (18.8)	P=1
Frequency of BSE						
Daily	42 (21.3)	5 (2.5)	X^2=96.3	10 (15.6)	10 (15.6)	X^2=0
Weekly	45 (22.8)	2 (1.0)	P<0.001*	8 (12.5)	8 (12.5)	P=1
Monthly	100 (50.8)	190 (96.4)		44 (68.8)	44 (68.8)	
Yearly	10 (5.1)	0 (0.0)		2 (3.1)	2 (3.1)	
Time for BSE						
Before menses	64 (32.5)	2 (1.0)	X^2=100.8	22 (34.3)	22 (34.3)	X^2=0
During menses	43 (21.8)	3 (1.5)	P<0.000*	12 (18.8)	12 (18.8)	P=1
After menses	90 (45.7)	192 (97.5)		30 (46.9)	30 (46.9)	
Place for BSE						
In front of a mirror	138 (70)	132 (52.8)	X^2=34.4	25 (39.0)	25 (39.0)	X^2=0

While bathing	9 (4.6)	26 (10.4)	P<0.01*	23 (36.0)	23 (36.0)	P=1
Lying on your bed	28 (14.2)	74 (29.6)		11 (17.2)	11 (17.2)	
Anywhere	22 (11.1)	18 (7.2)		5 (7.8)	5 (7.8)	
How it is done						
With one finger	113 (57.4)	11 (5.6)	X^2=169.2	30 (46.9)	30 (46.9)	X^2=0
With palm	65 (33.0)	186 (94.4)	P<0.000*	27 (42.2)	27 (42.2)	P=1
Anyhow	19 (9.6)	0 (0.0)		7 (10.9)	7 (10.9)	
Percentage knowledge score	40.9(483/1182)	85 (1005/1182)	Z=136.2P<0.000*	47.1	47.1	Z=0 P=1

*Statistically significant

Table 3: Attitude of Respondents towards BSE before and after education

Attitude of BSE	Study Population		Statistic	Control Population		Statistic
	Before [n=197 (%)]	After [n=197 (%)]	X^2, p-value	Before [n=64]	After [n=64]	X^2, p-value
Is BSE important?						
Yes	193 (98)	197 (100)	X^2=4.04,	54	54	X^2 = 0
No	4 (2)	0 (0)	P<0.05*	(84.4) 10(15.6)	(84.4) 10 (15.6)	P=1
Believe it can prevent breast cancer?						
Yes	189 (96)	196 (99.5)	X^2 =22.7	55(85.9)	55	X^2 = 0
No	8(4)	1 (0.5)	P<0.001*	9 (14.1)	(85.9) 9 (14.1)	P=1
Want to know more about it?						
Yes	192 (97.5)	196 (99.5)	X^2 = 27.7	57	57	X^2 = 0
No	5 (2.5)	1 (0.5)	P<0.001*	(89.1) 7 (10.9)	(89.1) 7 (10.9)	P=1

*Statistically significant

Table 4: Practice of BSE among respondents before and after education

Practice of BSE	Study Population		X^2, p-value	Control Population		X^2, p-value
	Before [n=197, (%)]	After [n=197, (%)]		Before [n=197, (%)]	After [n=197, (%)]	
Practice BSE?						
Yes	132 (67.0)	78 (39.6)	$X^2 = 29.7$	30 (46.9)	30 (46.9)	$X^2 = 0$
No	65 (33.0)	119 (60.4)	P<0.001*	34 (53.1)	34 (53.1)	P=1
If yes how often?	[n=132, (%)]	[n=78, (%)]		[n=30, (%)]	[n=30, (%)]	
Very often	13 (9.9)	15 (19.2)	$X^2 = 11.57$	0 (0)	0 (0)	$X^2 = 0$
Often	30 (22.7)	29 (37.2)	P<0.01*	4 (13.3)	4 (13.3)	P=1
Not often	89 (67.4)	34 (43.6)		26 (86.7)	26 (86.7)	
Time of performance						
Before menses	36 (27.3)	3 (3.8)	$X^2 = 42.16$	13 (43.3)	13 (43.3)	$X^2 = 0$
During menses	25 (18.9)	0 (0.0)	P<0.001*	7 (23.3)	7 (23.3)	P=1
After menses	71 (53.8)	75 (96.2)		10 (33.3)	10 (33.3)	
Place of performance						
In front of a mirror	107 (81.1)	53 (67.9)	$X^2 = 4.61$	7 (23.3)	7 (23.3)	$X^2 = 0$
Lying on bed	20 (15.1)	20 (25.7)	P=0.1	6 (20.0)	6 (20.0)	P=1
In the bathroom	5 (3.8)	5 (6.4)		17 (56.7)	17 (56.7)	
Why fail to practice	[n=65, (%)]	[n=119, (%)]		[n=34, (%)]	[n=34, (%)]	
No knowledge	25 (38.4)	8 (6.7)	$X^2 = 40.3$	28 (82.4)	28 (82.4)	$X^2 = 0$
Not up to the age	30 (46.2)	106 (89.1)	P<0.001*	3 (8.8)	3 (8.8)	P=1
Is not important	10 (15.4)	5 (4.2)		3 (8.8)	3 (8.8)	

*Statistically significant

CONCLUSION

The results obtained from the study depicted the effectiveness of one-on-one health education intervention in bringing about the desired changes in knowledge, attitude and practice of BSE among the secondary school girls. One limitation of this was that the majority of students recruited for the study were below the age of 20 years. The paradoxical effect of this on the outcome of the intervention has already been acknowledged in the discussion.

Recommendation:

Based on findings from this study that health education works, the following recommendation are necessary to improve on the existing situation concerning BSE among secondary school girls;

1. All women should be taught to routinely perform BSEs as part of their overall breast cancer screening strategy.
2. Young women should be empowered early in life through regular, sustained health education intervention in their schools and work places.
3. There is already a limited arsenal for detection of this terrible disease in the general population – mammography, a doctor's examination, and a woman's own breast self-exam. Therefore, for those women whose cancers are only found by physical examination—not mammography—an individual woman's self-examination may be her main opportunity for early detection with a potential survival benefit.
4. No effort should be spared to teach young women possibly on basis of one-on-one about their role in their own health care, especially today when so many women cannot afford expensive doctor visits and medical testing. Incorporating BSE lectures in the overall secondary school curriculum in Anambra state Nigeria might be a good way to start.

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