

# EFFECT OF HEALTH EDUCATION INTERVENTION ON BREAST CANCER KNOWLEDGE AMONG WOMEN OF CHILDBEARING AGE IN RIVERS-STATE

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Article History	Abstract
Original Research Article	<p><i>Breast cancer remains a deadly disease, but early detection significantly improves the survival rate. This quasi-experimental study evaluated the effect of a health education intervention on breast cancer knowledge among women of childbearing age in selected communities in Ogoni, Rivers State. The study specifically examined the effect of health education on knowledge of breast cancer, and early identification of its signs and symptoms. The study population comprised 21,929 women from four Local Government Areas (LGAs) in Ogoni. A sample of 664 women was selected through a multi-stage sampling procedure. Data were collected using a structured instrument assessing breast cancer knowledge. Statistical analyses were performed with SPSS version 27, including percentage, mean, standard deviation, and analysis of covariance (ANCOVA) at a 0.05 significance level. The pre-intervention results indicated that only 45.9% of participants provided correct answers to breast cancer knowledge items. After the intervention, correct responses increased to 62.4%. Similarly, knowledge on early identification of breast cancer signs rose from 50.3% to 67.5%, and knowledge of BSE techniques improved from 49.1% to 67.5%. ANCOVA results showed significant intervention effects on breast cancer knowledge of breast cancer [<math>F(1,632) = 903.45, p &lt; 0.05</math>], and early identification of signs and symptoms of breast cancer [<math>F(1,632) = 580.77, p &lt; 0.05</math>]. This study concludes that health education is a valuable tool to enhance breast cancer knowledge among women of childbearing age in Ogoni communities. It is recommended that healthcare practitioners expand educational campaigns on early breast cancer detection and improve health outcomes.</i></p> <p><b>Keywords:</b> Breast Cancer, Childbearing Age, Health Education, Knowledge.</p>
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<p>Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.</p> <p><b>Citation:</b> Sorbarikor Bernard, Folorunso Dipo Omisakin, Evidence Otobo Ngozi, Mercy Mgbere, Onwukwe Ndidi Aleruchi &amp; Jane Kue Baridah. (2026). EFFECT OF HEALTH EDUCATION INTERVENTION ON BREAST CANCER KNOWLEDGE AMONG WOMEN OF CHILDBEARING AGE IN RIVERS-STATE. UKR Journal of Medicine and Medical Research (UKRJMMR), 2(2), 47-55.</p>	

## Introduction

Breast cancer is a public health concern, particularly among women, this is because, the woman's breast is a valuable part of her body that is used for breast feeding. Besides the breast of a women enhances her look and gives her the pride of a woman. Breast cancer is therefore a highly detestable disease hence, the need for breast self-examination which is essential for early detection of breast cancer. Considering that there is no population-based screening programme in Nigeria, breast self-examination becomes important to reduce the surge of breast cancer (National Cancer Institute, 2019). Breast cancer though deadly, the survival rate is

high, if it is discovered at an early stage, and this places high demand on Self Breast Examination.

Breast cancer is the most common cause of cancer death in women and makes up 23% of all female-related cancers worldwide (International Agency for Research on Cancer [IARC], 2018). Globally, an estimated 1.7 million women were diagnosed with breast cancer and about 522,000 women die from this disease every year in 2018. More than 20% increase in breast cancer incidence rate & 14% increase in mortality. Breast cancer is also one of the major

causes of cancer deaths in the developing world (World Health Organization, 2018). In the developed world, breast cancer is a paradox. It is the number one cause of death when compared to developed countries. (2017) reported more than 1.7 million new breast cancer cases, representing about 25% of all new cancers in women (American Society of Cancer, 2018). In Africa; however, breast cancer has been reported as the commonest malignant cancer in women with an estimate of 2625 per 100,000 Ghana and Cameroon International Agency for Research on Cancer (IARC) (2018).

In developing nations, including Nigeria, the World Health Organization predicts that the incidence of breast cancer will increase by 70% by 2030 (World health organization, 2018). Maybe to promote caution, the American Cancer Society (2018) advises that women know their own breasts' normal form and feel of their breasts so that someone can go visit a health-care provider once any shifts occur (American Cancer Society, 2018). Inspired by these observations as observed by Nde et al. It is about women being able to know when changes occur in their breasts, and the most important reason for regular breast self-examination should be (2018).

In Nigeria, this situation is no different as the incidence of breast cancer is also said to be very high and it has been identified to be one of the most common cause of mortality in women. Jeronimo et al. (2018) Posited that, it has surpassed the cancer of cervix which hitherto was the number one killer of women and this is due to late presentation which was as a result of poor breast self-examination. In spite of the above findings, study showed that breast self-examination practice among undergraduate women was low, where only 9.0% knew how to perform breast self-examination and merely 3% practiced breast self-examination regularly (Nade et al., 2018). Likewise, in Nigeria Birhane (2017) found that only 19.0% of the women are practicing breast self-examination monthly.

Having knowledge about breast cancer is one sure way of conquering misconceptions about it and enhancing preventive behaviour such as breast self-examination. Knowledge is an understanding of required facts, information, or skills through experience or education. Serdar, (2017) defined knowledge of breast self-examination as the awareness about self-breast examination. A study done in sub-Saharan and Nigeria showed that women knowledge of breast cancer is poor despite a global warning to adopt positive preventive behaviour (Mohtasham, 2018). Furthermore, lack of knowledge on BSE was cited as the main reason for not performing BSE (Nade et al., 2018). Though, knowledge in itself does not automatically translate to practice but, it is

also not possible for one to practice what he/she does not know hence, its influence on practice.

The low survival rates of breast cancer among women can be attributed to lack of early detection and late presentation of the disease. Oluwatosin (2018) reported that late presentation of breast cancer patients suggests that women in Nigeria have poor knowledge and practice of breast self-examination which contributes to the increasing breast cancer cases. The International Agency for Research on Cancer (2018), reported that death rate of cancer in Nigeria is alarming as, over thirty (30) Nigerian women die every day from breast cancer among other cancers in Nigeria. Same report disclosed that globally, there will be 21 million new cases of cancer every year and about 13 million cancer death by the year 2030, while death rate from infectious disease reduced by 7 million every year unlike the cancer rate. This suggests the need for urgent action to be taken by both individuals and stakeholders in the healthcare system to help women, of which health education is one veritable tool for such intervention.

In Rivers State, Ogoni communities precisely, women sometimes come down with breast cancer presented at the late stage, making its management difficult. Though, breast cancer afflicts some of these women in their most fecund years of life, it can be successfully treated or managed with limited resources if detected early; most breast lumps that are later found to be cancers are detected very late, thus managing it at such advanced stage is expensive with a very slim chances of survival for the patient due to high risk of spread at that stage. Thus, the need for an effective strategy or tool such as health education, to influence both knowledge and practice. The following research questions were stated to guide the study:

- i. What is the effect of health education on knowledge of breast cancer among women of childbearing age in selected communities in Ogoni, Rivers State?
- ii. What is the effect of health education on early identification of breast cancer among women of Childbearing age in selected communities in Ogoni, Rivers State?

### **Hypotheses**

The following null hypotheses formulated to guide the study were tested at 0.05 level of significance:

**H<sub>01</sub>:** There is no significant effect of health education on the knowledge of breast cancer among women of childbearing age in selected communities in Ogoni, Rivers State.

**H<sub>02</sub>:** There is no significant effect of health education on knowledge of early identification of breast cancer among

women of childbearing age in selected communities in Ogoni, Rivers State.

## Methodology

The research design for this study was a quasi-experimental research design. It entailed observations made before and after some intervention or treatment administered by the researcher. The population for the study consisted of 21,929 women of childbearing age from the four LGAs in Ogoni, Rivers State (National Population Commission, 2006). The sample size for the study is 632; which was determined using the Cochran formula for calculating sample size:  $n = z^2pq/e^2$  Where:  $n$  = the sample size,  $e$  = level of significance or (limit of tolerable error) which is 0.05;  $p$  = proportion with the desired characteristics (27% reported from Rakhshani et al., 2022);  $q$  = proportion of the population who did not have the desired characteristics ( $q = 1-p$ ), and  $z = z$  value for 95% confidence level which is 1.96. Multistage sampling procedure was adopted for the study comprising of cluster sampling, simple random sampling, and purposive sampling technique. In the first stage, cluster sampling technique was adopted in which the four LGAs that made up Ogoni were grouped into two clusters (control and intervention). At the second stage, the simple random sampling technique was used to pick two communities from each of the LGA in each of the strata. At the third stage, the purposive sampling technique was used to select

the respondents from each of the selected communities for the study.

A structured test instrument called “Test Instrument on Knowledge of breast cancer and Practice of breast self-examination” was used to collect the data. The instrument has three sections. Section A, covered the socio-demographic characteristics of the respondents including the age, educational level, occupation, religion and parity marital status as well as family member had breast cancer in multiple response format. While section B collected data regarding knowledge of breast cancer using twenty-two items with a response option of ‘True or False’ format, section C was utilized to evaluate the knowledge among respondents about the signs and symptoms of breast cancer using fourteen items which were also opted between ‘True or False’ response options. It had a reliability of 0.81. Data collection was done in three stages: pretesting stage, intervention phase and post-test. Data collected were coded and later entered and cleaned in the Statistical Product for Service Solution (SPSS V-27). Data were analysed using descriptive statistics of mean and standard deviation (SD) to answer research questions and the analysis of covariance (ANCOVA) was utilized to test all null hypotheses.

## Results

The results of the study are shown below:

**Table 4.1: Socio-demographic characteristics of the respondents (n = 632)**

Socio-demographic Characteristics	Frequency	Percentage
<b>Age</b>		
<18	270	42.7
19-60	232	36.7
31-40	70	11.1
41-50	60	9.5
<b>Educational level</b>		
Primary	58	9.2
Secondary	132	20.9
Tertiary	442	69.9
<b>Occupation</b>		
Farming	58	9.2
Civil servant	86	13.6
Business/self employed	466	73.7
None	22	3.5
<b>Religion</b>		
Christianity	582	92.4
Islam	24	3.8
Tradition	12	1.9
Others	12	1.9

<b>Parity</b>		
<b>Primiparous</b>	60	9.5
<b>Multiparous</b>	72	11.4
<b>Grand multiparous</b>	82	13.0
<b>None</b>	418	132.1
<b>Marital status</b>		
<b>Single</b>	514	81.3
<b>Married</b>	118	18.7

Source: Researcher

Table 4.1 presents the sociodemographic characteristics of the respondents. The result revealed that majority 270 (42.7%) were <18 years, 232 (36.7%) were aged 19-60, and 70 (11.1%) were aged 31-40. It also revealed that 442 (69.9%) had attained the tertiary level of education, 132 (20.9%) attained secondary educational level and 58 (9.2%)

had primary level educational level. It further revealed that 466 (73.7%) were self-employed, 86 (13.6%) were civil servants, and 58 (9.2%) were farmers. Majority 582 (92.4%) were Christians, 41 (13.0%) were grand multiparous, and majority 514 (81.3%) were single.

**Table 2: Effect of health education on knowledge of breast cancer**

SN	Items	Pre-test (n = 318)		Post-test (n = 314)		Knowledge gain
		Corr. F(%)	Incorr F(%)	Corr. F(%)	Incorr F(%)	
1.	Breast cancer is most common among women	194(61.0)	124(39.0)	320(82.8)	54(17.2)	21.8%
2.	Breast cancer is hereditary (runs in family)	78(24.5)	240(75.5)	120(38.2)	194(61.8)	13.7%
3.	Breast cancer can be transmitted from one person to another through contact	292(91.8)	26(8.2)	272(86.6)	42(13.4)	-5.2%
4.	Breast cancer is a preventable disease	164(51.6)	154(48.4)	212(67.5)	102(32.5)	15.9%
5.	Breast cancer is not curable	130(40.9)	188(59.1)	186(59.2)	128(40.8)	18.3%
6	Mammography screening test is for breast cancer deflection	154(48.4)	164(51.6)	210(132.9)	104(33.1)	18.5%
7	Lump in the breast can be a sign of breast cancer	192(60.4)	126(39.6)	254(80.9)	120(19.1)	20.5%
8	Palpable mass or rash on the breast means nothing and should be ignored	72(23.9)	242(76.1)	108(34.4)	206(65.6)	10.5%
9	Discharge on the breast should be reported to the doctor	188(59.1)	130(40.9)	254(80.9)	120(19.1)	21.8%
10	Nipple retraction may not be a sign of breast cancer	116(36.5)	202(63.5)	166(52.9)	148(47.1)	16.4%
11	A change in the colour of the skin over the breast could be a sign of breast cancer	174(54.7)	144(45.3)	242(77.1)	72(22.9)	22.4%
12	Sore on the breast that does not heal could be a sign of breast cancer	160(50.3)	158(49.7)	220(70.1)	94(58.9)	19.8%

13	Redness and warmth over the breast is not common with breast cancer	122(38.4)	196(61.6)	158(50.3)	156(49.7)	11.9%
14	Breast cancer presents commonly as a painless lump	154(48.4)	164(51.6)	204(65.0)	110(70.0)	16.6%
15	Occupational exposure is associated with increased risk of breast cancer	144(45.3)	174(54.7)	198(63.1)	116(36.9)	17.8%
16	Sedentary life style is a risk factor to breast cancer development	106(33.3)	212(132.7)	148(47.1)	166(52.9)	13.8%
17	Diet has no relationship with breast cancer prevention	70(28.3)	228(71.7)	126(40.1)	188(59.9)	11.8%
18	Drinking excessive alcohol beverages increases chances of having breast cancer	128(40.3)	190(59.7)	184(58.6)	130(41.4)	18.3%
19	Moderate use of hormone replacement therapy reduces risk for breast cancer	150(47.2)	168(52.8)	200(63.7)	114(36.3)	16.5%
20	Exposure to ionized radiation increase the chances of having breast cancer	160(50.3)	158(49.7)	226(72.0)	88(28.0)	21.7%
21	Excessive consumption of fatty foods can lead to breast cancer	114(70.8)	204(64.2)	146(46.5)	168(53.5)	10.7%
22	Every woman above age 45 is at risk for breast cancer occurrence	168(46.5)	170(53.5)	198(63.1)	116(36.9)	16.6%
<b>Overall</b>		<b>146(45.9)</b>	<b>172(54.1)</b>	<b>196(62.4)</b>	<b>118(37.6)</b>	<b>16.5%</b>

*Decision rule: <50% is poor knowledge while ≥50% is good knowledge.*

Table 2 presents the effect of health education on knowledge of breast cancer among women of childbearing age in Ogoni. Specifically, more women at the post-test than the pretest knew that breast cancer is most common among women (61.0% vs 82.8%), Lump in the breast can be a sign of breast cancer (60.4% vs 80.9%), Discharge on the breast should be reported to the doctor (59.1% vs 80.9%), nipple retraction may not be a sign of breast cancer (36.5% vs 52.9%), and a change in the colour of the skin

over the breast could be a sign of breast cancer (54.7% vs 77.1%). The overall result showed that during the pretest, only 146 (45.9%) had correct answers to the knowledge items but after the intervention, during the post-test, this has increased to 196 (62.4%) with a knowledge gain of 16.5%. Thus, health education had a positive effect by increasing the knowledge of breast cancer among women of childbearing age in Ogoni.

**Table 3: Effect of health education on early identification of breast cancer among women of Childbearing age in selected communities in Ogoni, Rivers State**

SN	Items	Pre-test (n = 318)		Post-test (n = 314)		Knowledge gain
		Corr. F(%)	Incorr F(%)	Corr. F(%)	Incorr F(%)	
1.	Palpable mass or rash on the breast	174(54.7)	144(45.3)	246(78.3)	68(21.7)	23.6%
2.	Discharge on the breast could be a symptom of breast cancer	186(58.5)	264(41.5)	320(82.8)	54(17.2)	24.3%
3.	Nipple retraction may not be a sign of breast cancer	208(65.4)	110(34.6)	164(52.2)	150(47.8)	-13.2%
4.	A change in the colour of the skin over the breast	164(51.6)	154(48.4)	228(72.6)	172(27.4)	21.0%
5.	Sore on the breast that does not heal	178(56.0)	140(44.0)	248(79.0)	66(21.0)	23.0%
6.	Redness and warmth over the breast is not common with breast cancer	134(42.1)	184(57.9)	174(55.4)	140(44.6)	13.3%

7	Discharge from the nipple when a woman is not menstruating or lactating	156(49.1)	162(50.9)	218(69.4)	96(60.6)	20.3%
8	Puckering, dimpling or scaling of the skin can be a sign or symptom of breast cancer	154(48.4)	164(51.6)	210(132.9)	104(33.1)	18.5%
9	Changes in the size of the breast can be a sign or symptom of breast cancer	100(31.4)	218(68.6)	136(86.3)	178(56.7)	11.9%
10	Changes in the shape of the breast can be a sign or symptom of breast cancer	140(44.0)	178(56.0)	194(61.8)	120(38.2)	17.8%
11	Changes in the contour of the breast can be a sign or symptom of breast cancer	138(86.4)	180(56.6)	200(63.7)	114(36.3)	20.3%
12	Inverted nipple (pushed inward instead of sticking out)	154(48.4)	164(51.6)	208(132.2)	106(33.8)	17.8%
13	Breast lump/Lump in the armpit, can be a sign or symptom of breast cancer	178(56.0)	140(44.0)	246(78.3)	68(21.7)	22.3%
14	Dimpling, redness or scaling of the nipple be looked out for?	170(53.5)	148(46.5)	464(73.9)	82(26.1)	20.4%
	<b>Overall</b>	<b>160(50.3)</b>	<b>158(49.7)</b>	<b>212(67.5)</b>	<b>102(32.5)</b>	<b>17.2%</b>

Source: Researcher. Decision rule: <50% is poor while ≥50% is good.

Table 3 presents the effect of health education on early identification of breast cancer among women of childbearing age in Ogoni. Specifically, more women at the post-test than the pretest knew that palpable mass or rash on the breast is an early sign of breast cancer (54.7% vs 78.3%), discharge on the breast could be a symptom of breast cancer (58.5% vs 82.8%), a change in the colour of the skin over the breast (51.6% vs 72.6%), redness and warmth over the breast (42.1% vs 55.4%), and changes in

the size of the breast can be a sign or symptom of breast cancer (31.4% vs 86.3%). The overall result showed that during the pre-test, only 160 (50.3%) correctly identified the signs and symptoms of breast but after the intervention, during the post-test, this increased to 200 (67.5%) with a knowledge gain of 17.2%. Thus, health education had a positive effect identification of early signs and symptoms of breast cancer among women of childbearing age in Ogoni.

**Table 4: Analysis of Covariate (ANCOVA) on effect of health education on knowledge breast cancer among women of childbearing age in selected communities in Ogoni, Rivers State**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial eta square
Corrected Model	7949.115	1	7949.115	903.450	0.67	0.001
Intercept	1.577	1	1.577	0.179	0.67	0.001
Pretest	7949.115	1	7949.115	903.450	0.00*	0.854
Error	1363.786	630	8.799			
Total	27639.000	632				
Corrected Total	1365.363	631				

\*Significant;  $p < 0.05$ .  $H_0$  rejected

Table 4 showed the Analysis of Covariate (ANCOVA) which was conducted to ascertain the effect of health education on knowledge of breast cancer among women of childbearing age in selected communities in Ogoni. The result of the ANCOVA showed that the intervention had a significant effect [ $F(1,632) = 903.45$ ,  $p < 0.05$ ] on knowledge of breast cancer. Furthermore, 85.4% ( $\omega^2 =$

0.854) of the variance in the post-test knowledge score could be explained by the intervention. Therefore, the null hypothesis which stated that, health education has no significant effect on knowledge of breast cancer among women of childbearing age in selected communities in Ogoni was rejected.

**Table 5: Analysis of Covariate (ANCOVA) on effect of health education on early identification of breast cancer among women of childbearing age in selected communities in Ogoni, Rivers State**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial eta square
Corrected Model	3974.174	1	3974.174	580.777	0.049	0.025
Intercept	26.874	1	26.874	3.927	0.049	0.025
Pretest	3974.174	1	3974.174	580.777	0.000*	0.789
Error	1060.642	630	6.886			
Total	14945.000	632				
Corrected Total	1087.516	631				

\*Significant;  $p < 0.05$ .  $H_0$  rejected

Table 5 showed the Analysis of Covariate (ANCOVA) which was conducted to ascertain the effect of health education on early identification of breast cancer among women of childbearing age in selected communities in Ogoni. The result of the ANCOVA showed that the intervention had a significant effect [ $F(1,632) = 580.77$ ,  $p < 0.05$ ] on early identification of breast cancer. Furthermore, 78.9% ( $\omega^2 = 0.789$ ) of the variance in the post-test score could be explained by the intervention. Therefore, the null hypothesis which stated that, health education has no significant effect on early identification of breast cancer among women of childbearing age in selected communities in Ogoni was rejected.

## Discussion

The findings of the study were discussed below:

The findings indicated that health education intervention on the topic was effective in raising knowledge on breast cancer. This aligns with the findings of Maitanmi et al. (2023) study which revealed extremely high level of knowledge on breast self-examination. The result also corroborates that of Oboli et al. (2025) which demonstrated good understanding of BSE. The finding of this study is also consistent with that of Iwuoha et al. (2023) in Abia State, Nigeria which showed good knowledge of breast self-examination. But, this study result is contrary to Casmir et al. (2015) which also reported poor knowledge of BSE among female undergraduates in South-Eastern Nigeria. The discrepancy between the previous study and this one may relate to differences in the sites where these studies were conducted.

The result of the [insert analysis appropriate for your data] demonstrated that, after controlling for other covariates that affected the outcome; knowledge of breast cancer was significantly determined by exposure to the intervention and thus variance in post-test knowledge score could be

explained by whether or not one attended an educational intervention on breast cancer. This finding is in agreement with that of Asuquo and Olajide, (2015) in Calabar who reported that health education had a statistically significant effects on the knowledge about breast cancer. The finding of this study is consistent with that of Rakhshani et al. (2022) in Iran which showed that health education had influenced if statistically on the knowledge of breast cancer.

The net effect suggested that health education intervention influence on early recognition of breast cancer signs and symptoms as more people became aware about the signs and symptoms breast cancer after health education intervention. The result of this study is similar to the one done by Ossai et al (2019) which showed that the highest proportion noted that they were aware of the signs and symptoms of breast cancer. The result of this study is consistent with Koc et al (2019) which reported that most were familiar with the breast cancer signs and symptoms. This study's finding is also in concordance with that of Yakubu et al. (2014) that also shown level of knowledge on signs and symptoms about breast cancer was high.

Results showed that the intervention significantly influenced early identification of breast cancer, as the variance in post-test scores was explained by the intervention. This finding of the study agrees with that of Asuquo and Olajide (2015) in Calabar which found that health education had a statistically significant difference on the knowledge of signs and symptoms of breast cancer which aids early identification of breast cancer. The result of the present study is similar to that of Gandeh and Milaat (2000) in Saudi Arabia who reported that health education given among women had statistically significant effect on the knowledge

regarding signs and symptoms of breast cancer helpful for early identification.

## Conclusion

Based on the finding of the study, it was concluded that, health education is a veritable tool which can influence various aspects of health including the knowledge of breast cancer and breast self-examination among women of childbearing age in selected communities in Ogoni, Rivers State.

## Implications of the study

The findings of the study revealed the following:

- i. **For Women:** The study empowers women of childbearing age with vital knowledge about breast cancer and enhances their skills in breast self-examination (BSE), promoting early detection and timely medical intervention.
- ii. **Health Care Practitioners:** It underscores the importance of health education as a key intervention strategy and encourages healthcare providers to intensify breast cancer awareness campaigns and BSE training in rural communities.
- iii. **Policy Makers and Health Organizations:** The findings provide evidence for integrating structured health education programs into public health policies and community health initiatives aimed at reducing breast cancer morbidity and mortality.

## Recommendations

Based on the conclusion of the study, the following recommendations were made:

1. Health care practitioners should intensify the campaign on breast self-examination to enhance early identification of breast cancer.
2. Health educator should not relent in their effort to promote breast self-examination among women of childbearing age.

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