Original

# Knowledge of Breast Cancer and Practice of Breast Self-Examination Among Female Students at Federal College of Education (Technical) Asaba, Nigeria

*[1]Ekeneam Nkadi Omo, [2]Alphonsus Rukevwe Isara*

*[1]Department of Anaesthesiology Federal Medical Centre, Asaba, Delta State, Nigeria.*
*[2]Department of Public Health and Community Medicine, University of Benin, Benin City, Nigeria.*

**Corresponding author: Alphonsus R. Isara,** Department of Public Health and Community Medicine, University of Benin, Benin City, Nigeria. mansaray2001@yahoo.com: +2348034057565

Article history: Received 30 August 2025, Reviewed 22 September 2025, Accepted for publication 30 September 2025

## Abstract

**Background:** This study assessed the knowledge of breast cancer and practice of breast self-examination (BSE) among female undergraduate students at Federal College of Education (Technical), Asaba, Delta State, Nigeria.
**Methods:** This descriptive cross-sectional study utilized a structured, self-administered questionnaire for data collection. IBM SPSS version 26.0 was used for data analysis. Statistical significance was set at p-value less than 0.05.
**Results:** Four hundred students with a mean age of 23.0±4.2 years were studied. Majority 358 (89.4%) had heard of breast cancer with print/electronic media being the highest source of awareness 150 (41.9%). The students knew breast lump 163 (45.5%), breast pain/soreness 108 (30.2%) and discharge from the breast 29 (8.1%) as symptoms and signs of breast cancer, and BSE 207 (57.8%) and mammography 40 (11.2%) as early detection methods of breast cancer. Their knowledge of risk factors of breast cancer was poor, positive family history 159 (44.4%), exposure to ionizing radiation 153 (42.7%), smoking 141 (39.4%), oral contraceptives use 119 (31.8%), being a woman 114 (31.8%). Two hundred and fifteen (53.8%) had ever performed BSE, and 103 (47.9%) performed it monthly. The older students (p<0.0001), those in higher level of study (p<0.0001) and those with positive family history of breast cancer (p=0.042), statistically significantly practised BSE.
**Conclusion:** The overall knowledge of breast cancer and its associated risk factors were poor among the students, but their practice of BSE was fair. Massive awareness campaign and advocacy for health education on breast cancer and its early prevention measures is recommended.

**Keywords**: *Breast cancer, breast self-examination, female undergraduate students, Asaba, Nigeria*

This is an open access journal and articles are distributed under the terms of the Creative Commons Attribution License (Attribution, Non-Commercial, ShareAlike" 4.0) - (*CC* BY-NC-SA 4.0) that allows others to share the work with an acknowledgement of the work's authorship and initial publication in this journal.

**How to cite this article**

*Omo EN, Isara AR.* Knowledge of Breast Cancer and Practice of Breast Self-Examination Among Female Students at Federal College of Education (Technical) Asaba, Nigeria. The Nigerian Health Journal 2025; 25(3):1276 – 1285. https://doi.org/10.71637/tnhj.v25i3.1204

## INTRODUCTION

Breast cancer has become a serious public health problem in many parts of the world including Nigeria. It is the commonest cancer, remains the most fatal malignancy in women across the world and the most frequently occurring cancer in women. In 2020, there were about 2.3 million new cases of breast cancer globally and about 685 000 deaths from this disease, with large geographical variations observed between countries and world regions.[1,2] Globally, female breast cancer has surpassed lung cancer as the most commonly diagnosed cancer and the lifetime risk of developing breast cancer is at an incidence level of 1 in 9.[2] Breast cancer was the most common cancer in women in 157 countries out of 185 in 2022.[3]

There has been significant progress made over the years with regards to a cure for breast cancer. In the United States, the average five-year survival rate for people with breast cancer is 91%, while the average ten-year survival rate is 83%.[4] The hallmark of achieving these figures is early detection and treatment. In Nigeria, five-year survival rate has been estimated to be very low, ranging from 24 – 33%.[5-7] The factors responsible to this include but not limited to lack of awareness and poor knowledge of breast cancer, low socio-economic status, late-stage presentation of the disease, poor follow-up care, and limited access to optimal treatment resources. These factors result in most women in Nigeria presenting for the first time in the clinic at an advanced stage of the disease.

One of the early signs of breast cancer is a lump in the breast. A breast lump may be benign or malignant. Early detection of breast cancer can efficiently reduce the consequent mortality and morbidity.[8] In developed countries, breast cancer screening is usually done using mammography. However, the use of mammography is limited and distant to most women in sub-Saharan Africa (SSA). In the absence of readily available mammographic screening, notwithstanding its known limitations, BSE remains a feasible and practical alternative for African women.[9]

In many SSA countries including Nigeria, the level of awareness and knowledge of breast cancer as well as uptake of basic screening methods among teenage girls and young women is still not quite encouraging. Most students in the higher institutions in Nigeria fall within the age group of adolescent and young adults. These are the formative years during which women are getting used to their sexuality, thus is the best time for women to be made 'breast-aware' with cheap early detection measures of breast cancer such as BSE which may in turn lead to an early diagnosis and prompt treatment. This gives credence in Nigeria where national screening programs are not well established.

This study assessed the knowledge of breast cancer and practice of BSE among female undergraduate students at Federal College of Education (Technical), Asaba, Delta State, Nigeria.

## METHODOLOGY

### Study design and area

This was a descriptive cross-sectional study carried out among full time female students at Federal College of Education (Technical), Asaba, Delta State, Nigeria, from 1st March to 31st July 2021. The Federal College of Education (Technical) is a tertiary institution which has both full time and part time students undergoing training in different courses that will lead to the award of the National Certificate of Education (NCE). As at the time of the study, the school had a total student population of 2,687 comprising of 2,034 full time students and 653part time students. The total population of the full-time female students was 1,677 which comprised of 308 in NCE 1, 454 in NCE 2, and 915 in NCE 3.

### Study population

Adult full time female students who were aged 18 years and above and as such are eligible to give informed consent, female students who had not had breast surgery, and not pregnant or nursing a baby, were included in the study.

### Sample size determination

The minimum sample size required for this study was determined using the Cochran formula for sample size determination for single proportion.[10] The following assumptions were made: a confidence interval of 95%; the estimate of the expected proportion (p) of 55.3% being the proportion of female undergraduate students who were knowledgeable about BSE in a previous study carried out in Ebonyi State University, Abakaliki, South Eastern Nigeria,[11] a desired level of absolute precision (*d*) of ± 5%. The calculated sample size was 380. After accounting for nonresponse at a rate of 5%, the sample size came up to 399.


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

**Sampling technique and recruitment**
A disproportionate stratified sampling technique was used to select and recruit participants for this study. The students were stratified according to their year in the school; NCE 1, NCE 2 and NCE 3. The calculated sample size was allocated equally to the three strata. In each stratum, the participants were consecutively recruited until a total of 150 was gotten.

**Data collection**
The data collection was by means of a structured, pre-tested, self-administered questionnaire. The questionnaire contained three sections. Section one assessed the socio-demographic characteristics of the participants, section two assessed the knowledge of breast cancer and its associated risk factors, while section three assessed the awareness of BSE as a screening method for breast cancer and the practice of BSE among the participants.

**Data analysis**
Data collected were screened for completeness, coded and analysed using IBM SPSS version 26.0 (IBM Corp, Armonk, NY, USA). An initial univariate analysis was done for all the variables to determine their distribution of the variables. Chi square test was carried out to test the association between the socio-demographic characteristics of the participants and their practice of BSE. A p value of 0.05 was considered statistically significant.

**Ethical consideration**
Ethical approval was obtained from the Research Ethics Committee of the College of Medical Sciences, University of Benin (protocol number: CMS/REC/01/VOL.2/170). A written informed consent was obtained from the students before data collection. Permission was also sought and obtained from the management of the institution.

## RESULTS
A total of 400 students participated in this study. The students were aged 18 to 43 years with a mean age of 23.0±4.2 years and those within 21-25 years age group accounted for the highest proportion 196 (49.0%). All the levels of study were represented with NCE 3 having the highest proportion 176 (44.0%). Majority of the students were single 323 (80.3%) and had parents with secondary and tertiary level of education. A few of them 33 (9.2%) had positive family history of cancer of the breast (Table 1).

The awareness and knowledge of breast cancer is shown in table 2. Majority 358 (89.4%) of the students have heard of breast cancer with print/electronic media being the highest source of awareness 150 (41.9%), followed by healthcare worker 75 (20.9%) with awareness from parents/relatives being the least13 (3.6%). Among the students who were aware of breast cancer, lump in the breast 163 (45.5%), pain/soreness in the breast 108 (30.2%) and discharge from the breast 29 (8.1%) were the predominant signs and symptoms of breast cancer mentioned by them. Concerning methods of early detection of breast cancer, 207 (57.8%) and 40 (11.2%) knew BSE and mammography respectively.

Table 3 shows the knowledge of risk factors of breast cancer by the students. Positive family history 159 (44.45), exposure to ionizing radiation 153 (42.7%), smoking 141 (39.4%), the use of oral contraceptives 119 (31.8%), being a woman 114 (31.8%) were the most identified risk factors of breast cancer. Few students mentioned obesity 59 (16.5%), late age at first pregnancy 63 (17.6%), and age ate first menstruation 79 (22.1%).
A total of 215 (53.8%) responded in the affirmative that they had ever performed BSE with almost half 103 (47.9%) performing it monthly. More than two-thirds 150 (69.8%) of those who had ever preformed BSE had received training on how to perform it. Healthcare workers 75 (50.0%), the media 41 (27.3%) and peer/friends were the sources of the training. Few respondents 7 (4.7%) received training from their mother/sister. Slightly more than half 89 (54.0%) commenced the practice of BSE at the age of 20 years and below while 89 (41.4%) of them performed it in front of a mirror (table 4).

The socio-demographic characteristics and the practice of BSE by the students is shown in table 5. The practice of BSE increased with increasing age group up to the age group of 26 – 30 years. The older students performed BSE more than their younger counterparts. The association between age and practice of BSE was statistically significant ($p<0.0001$). Similarly, the practise of BSE increased with the level of study of the student and this association was statistically significant ($p<0.0001$). A higher proportion of students who had positive family history of breast cancer practiced BSE


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

when compared to those who do not have or who were not sure, and this association was statistically significant (p=0.042). The association between the marital status (p=0.213), the level of education of the mother (p=0.770), and the level of education of the father (p=0.392) of the students and the practice of BSE were not statistically significant.

**Table 1:** Socio-demographic characteristics of the participants

| Variables | Frequency (n=400) | Percent |
|---|---|---|
| **Age group (years)** | | |
| ≤20 years | 128 | 32.0 |
| 21-25 years | 196 | 49.0 |
| 26-30 years | 55 | 13.8 |
| >30 years | 21 | 5.3 |
| **Mean age 23.0 ± 4.2 years** | | |
| **Level of study** | | |
| NCE 1 | 106 | 26.5 |
| NCE 2 | 118 | 29.5 |
| NCE 3 | 176 | 44.0 |
| **Marital status** | | |
| Single | 323 | 80.3 |
| Married | 69 | 17.3 |
| Divorced | 6 | 1.5 |
| Widowed | 1 | 0.3 |
| Separated | 1 | 0.3 |
| **Level of education of mother** | | |
| None | 29 | 7.2 |
| Primary | 57 | 14.2 |
| Secondary | 157 | 39.3 |
| Tertiary | 157 | 39.3 |
| **Level of education of father** | | |
| None | 25 | 6.3 |
| Primary | 40 | 10 |
| Secondary | 169 | 42.3 |
| Tertiary | 166 | 41.5 |
| **Family history of breast cancer** | | |
| No | 309 | 86.3 |
| Yes | 33 | 9.2 |
| Do not know | 16 | 4.5 |

**Table 2:** Awareness and knowledge of breast cancer among the participants

| Variables | Frequency | Percent |
|---|---|---|
| **Awareness of breast cancer (n=400)** | | |
| Yes | 358 | 89.5 |
| No | 42 | 10.5 |
| **Source of awareness (n=358)** | | |
| Print/electronic media | 150 | 41.9 |
| Health worker | 75 | 20.9 |
| Peers/friends | 40 | 11.2 |
| Books/magazines | 34 | 9.5 |
| Teachers | 23 | 6.4 |


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

| Variables | Frequency | Percent |
|---|---|---|
| Social media/internet | 23 | 6.4 |
| Parents/relatives | 13 | 3.6 |
| **Symptoms and signs of breast cancer (n=358)** | | |
| Lump in the breast | 163 | 45.5 |
| Pain/soreness in the breast | 108 | 30.2 |
| Discharge from the breast | 29 | 8.1 |
| Change in size of breast | 21 | 5.9 |
| Ulceration of the breast | 14 | 3.9 |
| Pulling in of the nipple | 10 | 2.8 |
| Weight loss | 8 | 2.2 |
| Change in shape of the breast | 5 | 1.4 |
| **Methods of early detection of breast cancer (n=358)** | | |
| Breast self-examination | 207 | 57.8 |
| Clinical breast examination | 111 | 31.0 |
| Mammography | 40 | 11.2 |

**Table 3:** Knowledge of risk factors for breast cancer

| Variable | Frequency (n=400) | Percent |
|---|---|---|
| **Obesity** | | |
| True | 59 | 16.5 |
| False | 131 | 36.6 |
| Uncertain | 168 | 46.9 |
| **Family history of breast cancer** | | |
| True | 159 | 44.4 |
| False | 88 | 24.6 |
| Uncertain | 111 | 31.0 |
| **Age at first menstruation** | | |
| True | 79 | 22.1 |
| False | 172 | 48.0 |
| Uncertain | 107 | 29.9 |
| **Caseation of menstruation** | | |
| True | 105 | 29.3 |
| False | 122 | 34.1 |
| Uncertain | 131 | 36.6 |
| **Use of oral contraceptives** | | |
| True | 119 | 33.2 |
| False | 72 | 20.1 |
| Uncertain | 167 | 46.6 |
| **Being a woman** | | |
| True | 114 | 31.8 |
| False | 146 | 40.8 |
| Uncertain | 98 | 27.4 |
| **Late age at first pregnancy** | | |
| True | 63 | 17.6 |
| False | 163 | 45.5 |
| Uncertain | 132 | 36.9 |
| **Exposure to ionizing radiation** | | |
| True | 153 | 42.7 |


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

| Variable | Frequency (n=400) | Percent |
|---|---|---|
| False | 56 | 15.6 |
| Uncertain | 149 | 41.6 |
| **Smoking** | | |
| True | 141 | 39.4 |
| False | 84 | 23.5 |
| Uncertain | 133 | 37.2 |
| **Never breastfed a child** | | |
| True | 106 | 29.6 |
| False | 146 | 40.8 |
| Uncertain | 106 | 29.6 |

**Table 4:** Practice of Breast-self Examination by the participants

| Variables | Frequency | Percent |
|---|---|---|
| **Ever performed BSE (n=400)** | | |
| Yes | 215 | 53.8 |
| No | 185 | 46.2 |
| **Frequency of performing BSE (n=215)** | | |
| Daily | 34 | 15.8 |
| Weekly | 37 | 17.2 |
| Monthly | 103 | 47.9 |
| Yearly | 41 | 19.1 |
| **Received training on how to perform BSE (n=215)** | | |
| Yes | 150 | 69.8 |
| No | 65 | 30.2 |
| **Source of BSE training (n=150)** | | |
| Healthcare workers | 75 | 50.0 |
| Media | 41 | 27.3 |
| Peers/friends | 27 | 18.0 |
| Mother/sister | 7 | 4.7 |
| **Age of commencement of BSE (n=215)** | | |
| ≤ 20 years | 116 | 54.0 |
| > 20 years | 99 | 46.0 |
| **Where BSE was performed (n=215)** | | |
| In front of a mirror | 89 | 41.4 |
| Lying on the bed | 85 | 39.5 |
| In the bathroom | 41 | 19.1 |

**Table 5:** Socio-demographic characteristics and the practice of Breast-self Examination

| Variables | Breast-self Examination | | $X^2$ | *P*-value |
|---|---|---|---|---|
| | Yes n (%) | No n (%) | | |
| **Age group (years)** | | | | |
| ≤ 20 | 47 (36.7) | 81 (63.3) | 28.051 | **<0.0001** |
| 21 – 25 | 112 (57.1) | 84 (42.9) | | |
| 26 – 30 | 41 (74.5) | 14 (25.5) | | |
| ≥ 30 | 15 (71.4) | 6 (28.6) | | |
| **Level of study** | | | | |
| NCE 1 | 33 (31.1) | 73 (68.9) | 40.915 | **<0.0001** |
| NCE 2 | 59 (50.0) | 59 (50.0) | | |
| NCE 3 | 123 (69.9) | 53 (30.1) | | |


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

| Variables | Breast-self Examination | | $X^2$ | *P*-value |
|---|---|---|---|---|
| | Yes n (%) | No n (%) | | |
| **Marital status** | | | | |
| Single | 167 (51.7) | 156 (48.3) | 4.946 | 0.213 |
| Married | 41 (59.4) | 28 (40.6) | (Fishers Exact) | |
| Divorced | 5 (87.3) | 1 (12.7) | | |
| Widowed | 1 (100) | 0 (0.0) | | |
| Separated | 1 (100) | 0 (0.0) | | |
| **Level of education of mother** | | | | |
| None | 14 (48.3) | 15 (51.7) | 1.133 | 0.770 |
| Primary | 29 (50.9) | 28 (49.1) | | |
| Secondary | 83 (52.9) | 74 (47.1) | | |
| Tertiary | 89 (56.7) | 68 (43.3) | | |
| **Level of education of father** | | | | |
| None | 11 (44.0) | 14 (66.0) | 2.997 | 0.392 |
| Primary | 18 (45.0) | 22 (55.0) | | |
| Secondary | 91 (53.8) | 78 (46.2) | | |
| Tertiary | 95 (57.2) | 71 (42.8) | | |
| **Family history of breast cancer** | | | | |
| No | 178 (57.6) | 131 (42.4) | 6.105 | **0.042** |
| Yes | 26 (78.8) | 7 (11.2) | | |
| Do not know | 11 (68.8) | 5 (31.2) | | |


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

## DISCUSSION

Breast cancer is a major threat to global public health and is on the increase and therefore a cause for concern. The disability or death of a female child or mother places a burden on the family, the community and the nation that depend on them. The consequences of breast cancer can be averted or mitigated largely by early detection and prompt management. This study revealed poor knowledge of the symptoms and signs, and risk factors of breast cancer among the students but their reported practice of BSE was fair.

In this study, it is quite worrisome that one-tenth of the students have not heard about breast cancer. This number is significant considering the morbid nature of breast cancer and the volume of health information that abound in the social media space globally. This finding may have resulted from the low contribution of teachers, social media/internet and parents/relatives as sources of awareness of breast cancer. With most of the parents in this study having attained at least a primary level of education, information on breast cancer ought to have started at the domestic level. Cultural beliefs considering the breast as one of the private parts of the body and discussions about such areas being regarded as private and sacred may be responsible for the low involvement of parents in the education of their children on breast cancer. This has serious public health implication for the prevention and control of breast cancer and, therefore, underscores the need for more advocacy to engage parents and school teachers to be involved in the dissemination of information on breast cancer to attain 100% awareness by female children child about breast cancer at the time they complete their secondary school education irrespective of where the school is located. The finding of this study corroborates a study in Cameroon which reported that 88.1% of undergraduate students of a Higher Teachers Training College were aware of breast cancer,[12] and in Otuoke, South South Nigeria which reported 94.5% awareness of breast cancer among female undergraduate students.[13] However, it was different from studies in Abuja and South-eastern Nigeria where all the respondents (100%) have heard of breast cancer.[11,14] The role of healthcare workers in creating awareness about breast cancer among the participants was low in this study. Healthcare workers are supposed to be the gatekeepers when it comes to disseminating the right information that will help promote the health and wellbeing of the citizens. Healthcare workers should target young women who visited any healthcare facility and educate them on breast cancer and how to prevent it to avoid missed opportunities.

Concerning knowledge of risk factors associated with breast cancer, the student showed varied responses which were less than 50% in all the questions related to the risk factors. This goes to show their knowledge gap about the risk factors associated with breast cancer and this is discouraging considering the importance of knowledge of risk factors as warning signals for breast cancer which could prevent the morbidity and mortality associated with it. Lack of knowledge of risk factors is capable of negatively influencing peoples' health seeking behaviour especially as it relates to seeking early intervention. This knowledge gap in risk factors associated with breast cancer have been reported in several studies in sub-Saharan Africa.[12,14-16] However, few studies especially those involving female undergraduate students in health-related fields expectedly have reported high knowledge of risk factors of breast cancer.[17-19]

This study also revealed overall poor knowledge of the symptoms and signs of breast cancer. Less than half of the respondents (45.5%) knew that breast lump was a symptom of breast cancer. Lump in the breast is one of the commonest presentations of breast cancer that should not be missed. There is high tendency for women to ignore a painless lump in the breast when in actual fact it is a dangerous signal of breast cancer. It becomes depressing when this knowledge is not readily available to the students in this study. This finding underscores the need for efforts to be put in place to give regular health education to female undergraduate students to correct the deficiency of their knowledge of breast lump and other symptoms and signs of breast cancer and thus seek urgent medical care if they experience these symptoms and signs.

The practice of BSE in this study was fair, as slightly more than half of the students affirmed that they had performed BSE. This may be attributable to a similar proportion of the students who identified BSE as a method of early detection of breast cancer. It is commendable that a higher proportion of those who had performed BSE had received training on how to perform and also practiced it at an earlier age. Healthcare workers fared better here as they were responsible for the training of half of the students who had practiced


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

BSE. These findings which are comparable to other studies in Nigeria and other parts of the world,[11,20-22] can be improved upon through health education and training on how to practice BSE accurately and in a timely manner. A study in southern Nigeria reported that educational intervention strategy significantly improved the practice of BSE among undergraduate students.[23] In Ethiopia, a study among female medical students reported that despite the adequate knowledge of BSE and breast cancer, the actual practice of BSE was very low (23%) among the medical students.[24] This is a demonstration of the fact that the uptake of breast cancer prevention through BSE is still a major public health challenge in SSA.

In this study, increasing age and level of study and positive family history of breast cancer were statistically significantly associated with the practice of BSE. This is not surprising because students at higher levels of study are likely older and as one gets older in age, the more likely one would be conscious with his or her health. Also, a positive family history buttresses the maxim that "experience is the best teacher". First-hand experience of a family member battling with breast cancer is one experience too many for any individual and no one would like to go through such ordeal. Therefore, older female students with positive family history of breast cancer can be recruited and trained as peer educator for BSE in the school environment and beyond.

**Limitation of the study**

A limitation of this study is the use of self-administered questionnaire to collect information on knowledge of breast cancer and practice of BSE which may have been prone to recall bias and social desirability.

**Implications of the findings**

This study underscores the need for the management of higher institutions incorporate a health awareness session which will include teaching female students on how to carry out BSE during the orientation programme for new intakes. There is also a need for further studies to explore the drivers (barriers and facilitators) of breast cancer awareness and the practice of BSE among female undergraduate students.

## CONCLUSION

The findings of the study show that the overall knowledge of breast cancer and its associated risk factors were poor among the students, but their practice of BSE was fair. There is an urgent need for massive awareness campaign and advocacy for health education on breast cancer and its early prevention measures particularly BSE targeted at young girls, parents, and the management of educational institutions.

## REFERENCES

1. Arnold M, Morgan E, Rumgay H, Mafra A, Singh D, Laversanne M, et al. Current and future burden of breast cancer: Global statistics for 2020 and 2040. Breast. 2022; 66:15-23. Doi: 10.1016/j.breast.2022.08.010.
2. Singh D, Ferley J, Siegel RL, Laversanne M, Soerjomatarin I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of the incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021; 71:209-249. Doi: 10.3322/caac.21660.
3. World Health Organization. Fact Sheet on Breast Cancer. 2024. Available at https://www.who.int/news-room/fact-sheets/detail/breast-cancer. Accessed 28th July 2025.
4. American Cancer Society. Cancer Statistics Center. 2025. Available from https://cancerstatisticscenter.cancer.org/#/. Accessed 28th July 2025.
5. Makanjuola SBL, Popoola AO, Oludara MA. Radiation therapy: A major factor in the five-year survival analysis of women with breast cancer in Lagos, Nigeria. Radiotherapy and Oncology. 2014;111(2)321-326. Doi: 10.1016/j.radonc.2014.03.013.
6. Olayide A, Isiaka A, Ganiyu R, Samuel O, Halimat A, Olalekan O, et al. Breast Cancer Treatment and Outcomes in Nigeria: A Systematic Review and Meta-analysis. Asian Pacific Journal of Cancer Care. 2023;8(3):591-598. Doi: 10.31557/apjcc.2023.8.3.591-598.
7. Atoyebi SB, Awodutire PO, Igbalajobi MM, Anifowose OO. Survival Times of Breast Cancer Patients in Nigeria Asian J. Immunol. 2023;6(1):209-223.
8. Crosby D, Bhatia S, Brindle KM, Coussens LM, Dive C, Emberton M, et al. Early detection of cancer. Science. 2022;375(6586):eaay9040. Doi: 10.1126/science.aay9040.
9. Panieri E. Breast cancer screening in developing countries. Best Practice & Research Clinical Obstetrics & Gynaecology. 2012;26(2):283-290. Doi: org/10.1016/j.bpobgyn.2011.11.007.


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X

10. Cochran WG. Sampling Techniques, 3rd ed., New York, John Wiley and Sons. 1977;223-34.
11. Ossai EN, Azuogu BN, Ogaranya IO, Ogenyi AI, Enemor DO, Nwafor MA. Predictors of practice of breast self-examination: A study among female undergraduates of Ebonyi State University, Abakaliki, Nigeria. Niger J Clin Pract. 2019;22(3);361-369. Doi: 10.4103/njcp.njcp_482_18.
12. Sama CB, Dzekem B, Kehbila J, Ekabe CJ, Vofo B, Abua NL, et al. Awareness of breast cancer and breast self-examination among female undergraduate students in a higher teacher training college in Cameroon. Pan Afr Med J. 2017; 28:91. Doi: 10.11604/pamj.2017.28.91.10986.
13. Alabrah PW, Eguvbe AO, Agbo J, Allagoa DO. Awareness of Breast Cancer and Practice of Breast Self-Examination Amongst Female Students of a Tertiary Institution in South-South Nigeria. Int J Cancer Clin Res. 2022; 8:175. Doi: 10.23937/2378-3419/1410175.
14. Isara AR, Ojedokun CI. Knowledge of breast cancer and practice of breast self-examination among female senior secondary school students in Abuja, Nigeria. J Prev Med Hyg. 2011; 52:186-190.
15. Peltzer K, Pengpid S. Awareness of breast cancer risk among female university students from 24 low, middle income and emerging economy countries. Asian Pac J Cancer Prev. 2014;15(18):7875-8. Doi: 10.7314/apjcp.2014.15.18.7875.
16. Karima B, Zineb S, Samir D, Mohamed BO. Awareness of Risk Factors for Breast Cancer among Casablanca Medical Students. Asian Pac J Cancer Care. 2023;8(2):311-317. Doi:10.31557/APJCC.2023.8.2.311-317.
17. Okolie UV. African Breast self-examination among female undergraduates in Enugu, Southeast, Nigeria. Journal of Medicine and Surgery 2020;7(7):001-007.
18. Al-Shiekh SSA, Ibrahim MA, Alajerami YS. Breast cancer knowledge and practice of breast self-examination among female university students, Gaza. The Scientific World Journal. 2021; 2021(1):1-7. Doi: 10.1155/2021/6640324.
19. Mehiret G, Molla A, Tesfaw A. Knowledge on risk factors and practice of early detection methods of breast cancer among graduating students of Debre Tabor University, Northcentral Ethiopia. BMC Women's Health. 2022;22:183. Doi: 10.1186/s12905-022-01768-0.
20. Ebirim CIC, Nwoke EA, Ibe SNO, Agwu ACO, Nwufo CR. Knowledge and practice of breast self-examination among female undergraduate in South-Eastern Nigeria. Health. 2015;7:1134-1141. Doi: 10.4236/health.2015.79129.
21. Haruna H, Chukwu EO, Ahmadu I, Teryila KR, Babaji M, Nelson L, Hamina D. Knowledge and Practice of Breast Self-Examination Among Female Nursing Students in University of Maiduguri, Borno State, Nigeria. International Journal of Clinical Oncology and Cancer Research. 2017;2(3): 57-64. Doi: 10.11648/j.ijcocr.20170203.12.
22. El Maouchi P, Fakhreddine O, Shmoury AH, El Zoghbi M, Chamseddine N, Abou Zeidane R, et al. Breast cancer knowledge in Lebanese females with positive family history. Medicine. 2023;102(7):e32973. Doi: 10.1097/MD.0000000000032973.
23. Uruntie RO, Oputa CH, Peters E, Otovwe A. Effect of educational intervention on the knowledge, attitude and practice of breast self-examination among female students at a private university in Southern Nigeria. BMC Cancer. 2024;24:355. Doi: 10.1186/s12885-024-12116-w.
24. Ameer K, Abdulie SM, Pal SK, Arebo K, Kassa GG. Breast Cancer Awareness and Practice of Breast Self-Examination among Female Medical Students in Haramaya University, Harar, Ethiopia. International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS). 2014;2(2)109-119.


Downloaded from www.tnhjph.com
Print ISSN: 0189-9287 Online ISSN: 2992-345X