Asian Journal of Medicine and Health

Volume 22, Issue 12, Page 259-271, 2024; Article no.AJMAH.124116
ISSN: 2456-8414

Awareness and Practices of Breast Cancer Detection among Female Undergraduates of Ebonyi State University, Nigeria

Simon Imakwu Okekpa [a,b,c*], Chibuikem Praise Idimma [c], Nelson C. Okpua [d] and Onyebuchi Frederick Orinya [e]

[a] Department of Medical Laboratory Science, David Umahi Federal University of Health Sciences, Uburu, Ebonyi State, Nigeria.
[b] International Institute for Oncology and Cancer Research, David Umahi Federal University of Health Sciences, Uburu, Ebonyi State, Nigeria.
[c] Department of Medical Laboratory Science, Ebonyi State University, Abakaliki, Nigeria.
[d] Department of Nursing Science, Faculty of Health Sciences and Technology, Ebonyi State University, Abakaliki, Nigeria.
[e] Department of Medical Biochemistry, David Umahi Federal University of Health Sciences, Uburu, Nigeria.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/ajmah/2024/v22i121159

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/124116

Original Research Article

Received: 03/08/2024
Accepted: 05/10/2024
Published: 30/12/2024

**Corresponding author: E-mail: siokekpa@gmail.com;*

Cite as: *Okekpa, Simon Imakwu, Chibuikem Praise Idimma, Nelson C. Okpua, and Onyebuchi Frederick Orinya. 2024. "Awareness and Practices of Breast Cancer Detection Among Female Undergraduates of Ebonyi State University, Nigeria". Asian Journal of Medicine and Health 22 (12):259-71. https://doi.org/10.9734/ajmah/2024/v22i121159.*

ABSTRACT

Background: Breast cancer is a global health issue affecting women with, early detection through breast-self-examination and Clinical-Breast Examination being crucial for increasing the rate of survival.
Aim: This study aimed to ascertain the level of awareness of breast cancer, the risk factors, and warning signs, evaluate the practice of breast-self-examination and Clinical-Breast Examination and ascertain further steps taken when warning signs were detected.
Methods: This cross-sectional study involved 300 undergraduate female students of Ebonyi State University, Nigeria. Data were obtained using a structured questionnaires in which the students answered questions on their Knowledge of breast cancer, and practice of breast-self-examination and Clinical-Breast Examination as well as further steps taken when warning signs were detected.
Results: Results show that 91% of the participants were aware of breast cancer. It also revealed that 40.7% and 42% of the students were unaware that age and smoking respectively are risk factors. Also, 60.7% and 72.3% of the students were unaware that redness and irritation respectively are warning signs of breast cancer. Majority of the participants were aware of breast-self-examination and clinical-breast examination but 64.3% had practiced breast-self-examination and a substantial 81.3% had never practiced Clinical-Breast Examination. This study demonstrated that, 9.3% practiced breast-breast examination daily, 13% weekly and 42.3% monthly. Only 16.3% had observed breast pain, 8% observed changes in nipple shape. After noticing warning signs, 30.3% went for medical consultation, 23.7% did laboratory screening and 16.7% removed lumps.
Conclusion: These findings indicate suboptimal breast-self examination and/or Clinical-Breast Examination practice, suboptimal awareness of the warning signs, and inadequate awareness of the risk factors of breast cancer. Public health awareness and enlightenment campaign is necessary to improve early breast cancer detection among Nigerian women.

Keywords: Breast cancer; questionnaire; breast-self-examination; clinical breast examination; warning sign; risk factors; undergraduate students; female students; Ebonyi State University.

1. INTRODUCTION

Breast cancer is the commonest form of malignancy amongst women worldwide and its early detection is fundamental to improving the disease outcome, which means that the earlier the breast cancer is detected, the better the consequence (Albeshan et al., 2020). There are 3 common techniques for breast cancer screening and early detection (Hassan et al., 2015). The most commonly recognised breast screening modality is mammography, whereas, breast self-examination (BSE) and clinical breast examination (CBE), play important additional roles in early cancer detection and overall breast health care (Hassan et al., 2015). In a situation where there are unorganised screening programs, timely detection of breast cancer occurs as a result of distresses expressed by women when they have presented with symptoms in the course of routine health care, or from CBE (Hassan et al., 2015). If women do not practice BSE, due to deficiency of knowledge on BSE technique or poor knowledge of its benefits and do not practice CBE, they are more likely to be diagnosed of breast cancer at advanced stages compared to women who adhere to breast screening recommendations (Abulkhair et al., 2010). It has been suggested that, in populations where women are diagnosed with breast cancer at advanced stage, it would probably be cost-effective to teach BSE and to screen by CBE to improve breast cancer outcomes (Albeshan et al., 2020). Thus, BSE and/or CBE plays a significant role in expediting early cancer detection (Albeshan et al., 2020; Abulkhair et al., 2010). Previous studies reported poor BSE awareness and practice in Nigeria (Obaji et al., 2013; Oluwakemi et al., 2022). The research aim to obtain information on the awareness of undergraduate students of Ebonyi State University (EBSU) on breast cancer, BSE and CBE and evaluate their knowledge on the risk factors of breast cancer, the warning signs as well as evaluate further steps taken when warning signs were detected.

This research is significant because it provided information on the awareness and practice of early breast cancer detection and revealed critical knowledge gaps in the practice of breast cancer detection. It has the potential to increase

the awareness of risk factors and early warning signs of breast cancer among female undergraduate students in Nigeria and help the public health workers plan for targeted interventions. It is crucial because it will help in the development of public health strategies for curbing breast cancer.

2. METHODS

2.1 Study Design

This study is an exploratory cross-sectional research conducted on female students of Ebonyi State University, Abakalikil through a semi structured questionnaire. Questionnaire was issued to each participant during face to face interactions with research assistants. Convenient sampling methods was implemented for this study.

2.2 Questionnaire Design

Extensive literature review (Maharjan et al., n.d.; Heng & Bae, 2021; Khaliq et al., 2021; Endrikat et al., 2024) was carried out before the development of a semi-structured questionnaire in English language. It covered questions related to demographic factors, Knowledge of Breast cancer and risk factors for breast cancer, Knowledge of Breast-Self Examination (SBE) and Clinical breast examination (CBE), and further steps taken after Breast Examination. The questionnaire was evaluated and validated by a Pathologist before distributing to the participants. The questionnaire was designed into sections as follows:

Socio-demographic information: The questions in socio-demographic section consist of questions on Age (in years), marital status (single, married, divorced), Level of study (100, 200, 300, 400, 500 and 600), Levels of awareness (yes, No).

Awareness and Knowledge related questionnaire: The awareness related questions were categorized into knowledge of Breast cancer and the options choose from were, “Yes or No”.

Risk factors related questionnaire: The questionnaire comprise of question that assessed the students’ awareness of risk factors of breast cancer such as smoking, Genes, Age, weak immune system, being obese/overweight, taking of hard drugs, and alcohol consumption. The options for response were, “Yes or No”.

Warning signs related questionnaire: The questionnaire asked if the students aware that Redness of affected Breast, Irritation of Breast, Swelling of the Breast, Rash on Breast, Abnormal Nipple discharge, Lumps in Breast, Lumps around collar bone, abnormal pain in the breast that remains after period ends, and Sore or wound on Breast are early warning signs and symptoms of breast cancer with the option choosing either “Yes or No”.

Practice related questionnaire: This part of the questionnaire asked if the students are aware of SBE and CBE (options to choose was either “Yes or No”). The students were asked if they have ever practiced SBE and CBE with the options of replying “Yes or No”. The questionnaire also asked how often the students check their breast in which the options to choose were Daily, weekly, monthly and never.

Questionnaire related to changes detected by participant during SBE: The participants were asked if they detected changes like Lump in Breast, Change in Nipple, Abnormal Nipple discharge, Abnormal breast pain that remains after period end, Lumps in collar bone, Lumps in armpit during SBE (with a response option of “Yes or No”). Questionnaire also asked if the participants are aware that the above could be signs of Breast cancer (with a response option of “Yes or No”).

Questionnaire relating to further steps taken after Breast Examination: The participants were asked if they took further steps (See Doctor, Did Lab screening, and Remove Lumps) when warning signs were detected during SBE with answer options being “Yes or No”.

2.3 Inclusion and Exclusion Criteria

Only undergraduate female students of EBSU who gave consent were included in this research. Staff and post-graduate students of EBSU were excluded.

2.4 Calculation of sample size

Simple-random sampling was applied in the sample selection.

Calculation of sample size:

$$\text{Sample size } (n) = z^2pq / e^2$$

Where, n= sample size required

z= 95% confidence level (1.962)

p = predicted rate for the given indicator in the study area 26%
q = 1-p

e= error margin of 5 % (with 0.05 as the standard value)

Sample-size (n) = 1.962× 0.27 (1- 0.27) / 0.05

Sample size = 303

The total sample size used = 300 (3 dropped out).

2.5 Data Collection

This study was piloted from January to December 2023. A total of 300 female undergraduate female students were included in the study; the sample size calculation suggested that at 95% confidence interval. The trained researcher described the aim and the process of interview to the students. Anonymity and confidentiality of the students were emphasized and informed consent was obtained.

2.6 Data Analysis

The answer to questions were coded in the format of “yes” or “no”. The age, and level of study of the students were included as the demographic factors. The collected data were documented in Excel 2013 and SPSS (Statistical Package for the Social Sciences) version 27.0.1 was used to analyse the data. To get the P-value, the questionnaire’s data were entered into the SPSS and subjected to bivariate correlation analysis. P-value of 0.05 was considered significant. The interpretation of the data was via Descriptive statistics.

3. RESULTS

The finding show the level of awareness of Breast Cancer, the risk factors, the warning signs, their knowledge on SBE and CBE as well as steps taken after warning signs are discovered by female undergraduate students of Ebonyi State University.

3.1 Demographic Factors of the Participants

A total of three hundred (N=300) students participated in this study. The results obtained show that 38.3% (N=115) of the participants were between the ages of 15-20 years, 49% (N=147) were aged 21-25 years, 10% (N=30) of the participants were between the ages of 26-30 years and 2.7% (8) were above 30 years. Thirty-eight participants (12.7%) were married while two hundred and sixty (86.7%) participants were unmarried, two of the participants were divorced. The participants were selected from different levels of undergraduate study (Table 1).

3.2 Knowledge of Participants about Breast Cancer and Its Risk Factors

The knowledge of the participants about breast cancer and the risk factors were assessed. Our results show that 91% of the participants responded in affirmative, that they heard of breast cancer while 9% never heard of breast cancer (Table 2). It was also observed that 45.3% of the participants said they knew that smoking is a risk factor for developing breast cancer while, 54.7% did not know that smoking was a risk factor whereas, 63.7% of the students were aware that genes risk factors of breast cancer and 36.3% was not aware that genes are risk factors for breast cancer (Table 3). The results obtained show that 64.3% (193) of the participants are not aware that age was a risk factor for breast cancer. Only 35.7% (N=107) knew that age was a risk factor for breast cancer. Our results also show that 64% of the participants knew that weak immune system is one of the risk factors of breast cancer while 36% don’t know. Our observations also revealed that only 28% (N=84) knew that Obesity was a risk factor while, 72% (N=216) were not aware that Obesity was a risk factor for breast cancer. Also 45% of the participants are not aware that taking hard drugs could predispose them to breast cancer. Whereas 55% knew that taking hard drugs can predispose to breast cancer risk. Knowledge of the participants on alcohol as a risk factor of breast cancer revealed that 61.7% said they didn’t know that taking alcohol is a risk factor for developing breast cancer while 38.3 % were aware (Table 3).

3.3 Knowledge of the Participants on the Warning Signs of Breast Cancer

The knowledge of the participants on the warning signs of breast cancer was assessed and the

results obtained show that significant (P < 0.05) number of the students reported that they were aware that redness, irritation of the breast, lumps around the collarbone, changes in the shape of the nipple, abnormal pain in the breast that remains after period ends, Redness of affected Breast, swelling of the Breast, rash on the Breast, and abnormal nipple discharge are warning signs of breast cancer, whereas, insignificant number (P ≥ 0.05) of the students responded that they knew that sores or wounds are warning signs of breast cancer (Table 4).

Table 1. Socio-demographic characteristics of study participants

Parameters		
Age(years)	**Number**	**Percentage (%)**
15-20	115	38.3
21-25	147	49
26-30	30	10
Above 30	8	2.7
Marital Status		
Single	260	86.7
Married	38	12.7
Divorced	2.	0.6
Level of study		
100	72	24
200	67	22.3
300	62	20.7
400	50	16.7
500	48	16
600	1	0.3

Table 2. Participants levels of awareness of breast cancer

Variables	**Number**	**Percentage (%)**	**P value**
Heard of Breast cancer			
Yes	273	91	<0.001
No	27	9	

Table 3. Participants knowledge of risk factors on breast cancer

Parameters	**Number**	**Percentage (%)**	**P value**
Smoking			
Yes	136	45.3	0.003
No	164	54.7	
Genes			
Yes	191	63.7	< 0.001
No	109	36.3	
Age			
Yes	107	35.7	0.003
No	193	64.3	
Weak Immune system			
Yes	192	64	< 001
No	108	36	
Being Obese or overweight			
Yes	84	28	0.297
No	216	72	
Taking hard drugs			
Yes	165	55	0.040
No	135	45	
Taking alcohol			
Yes	115	38.3	0.255
No	185	61.7	

Table 4. Levels of awareness of the early warning signs and symptoms of breast cancer

Parameters	Number	Percentage (%)	P value
Redness of affected Breast			
Yes	209	69.7	< 0.001
No	91	30.3	
Irritation of Breast			
Yes	217	72.3	< 0.001
No	83	27.7	
Swelling of the Breast			
Yes	249	83	< 0.001
No	51	17	
Rash on Breast			
Yes	185	61.7	0.029
No	115	38.3	
Abnormal Nipple discharge			
Yes	231	77	0.048
No	69	23	
Lumps in Breast			
Yes	257	85.7	< 0.001
No	43	14.3	
Changes in the shape of Nipple			
Yes	194	64.7	< 0.001
No	106	35.3	
Lumps around collar bone			
Yes	163	54.3	< 0.001
No	137	45.7	
Abnormal pain in the breast that remains after period ends			
Yes	201	67	0.001
No	99	33	
Sore or wound on Breast			
Yes	187	62.3	0.296
No	113	37.7	

According to the results displayed on Table 4, 69.7% of the students were aware that redness is a warning sign while 30.3% were not aware of the aforementioned. Our survey showed that 72.3% of the participants were aware that irritation of the breast is a warning sign while 27.7% admitted that they were unaware of it. Results also showed that 45.7% of the participants don't know that lumps around the collarbone are warning signs, 54.3% responded that they knew that lumps around the collarbone are warning signs. Some of the participants (35.3%) were unaware that changes in the shape of the nipple are actually a warning sign where as 64.7% were aware. Only 37.7% were unaware that sores or wounds on the breast is a warning sign and 33% were unaware that abnormal pain in the breast that persists even after the end of a menstrual period, is a warning sign of breast cancer while 67% were aware (Table 4).

3.4 Levels of Participant Awareness and Practice of SBE and CBE

Based on the findings of the research displayed in the table below: Majority of the participants (80.7%) had heard of breast-self-examination and clinical breast examination but only about 64% of the population had practiced breast-self-examination (SBE) while 36% had never carried out SBE (Table 5). Majority of the participants (81.3%) had never done Clinical Breast Examination (CBE) while 18.7% of the participants responded that they had carried out clinical breast examination. Our results show that majority of the participants were aware of SBE. Few participant (9.3%) practiced SBE daily, 13% practiced weekly, 42.3% practiced SBE on monthly bases, whereas, 35.5% had never checked. Most of the participants (64.3%) heard about SBE on social media while 23.7% (N=71) heard about SBE at seminar (Table 5).

Table 5. Participant awareness and practice of SBE and CBE

Parameters	Number	Percentage (%)	P value
Heard of SBE and CBE			
Yes	242	80.7	< 0.001
No	58	19.3	
Have you done SBE?			
Yes	192	64	< 0.001
No	108	36	
Ever done CBE?			
Yes	56	18.7	0.017
No	244	81.3	
How often do you check?			
Daily	28	9.3	< 0.001
Weekly	39	13	
Monthly	127	42.3	
Never	106	35.5	
How did you know about SBE and CBE			
Social media	193	64.3	0.022
Seminar	71	23.7	
News paper	11	3.7	
Television	22	7.3	
Never	3	1	

Table 6. Observations made and changes detected by participant during SBE

Parameters	Number	Percentage (%)	P value
Lump in Breast			
Yes	54	18	< 0.001
No	246	82	
Change in Nipple			
Yes	24	8	0.017
No	276	92	
Abnormal Nipple discharge			
Yes	21	7	0.005
No	279	93	
Abnormal breast pain that remains after period end			
Yes	49	16.3	0.071
No	251	83.7	
Lumps in collar bone			
Yes	35	11.7	0.040
No	265	88.3	
Lumps in armpit			
Yes	43	14.3	0.006
No	257	85.7	
Are you aware that the above could be signs of Breast cancer			
Yes	187	62.3	<0.001
No	113	37.7	

Table 7. Further Steps Taken by the students after discovering warning signs during SBE

Parameters	Number	Percentage (%)	P value
See Doctor			
Yes	91	30.3	0.022
No	209	60.7	
Did Lab screening			
Yes	71	23.7	0.014
No	229	76.3	
Remove Lumps			
Yes	50	16.7	0.453
No	250	83.3	

3.5 Observations Made by Participant during SBE

In order to investigate the possible prevalence rate of breast cancer among EBSU students, the participants were asked if they noticed any signs and/or symptoms of breast cancer while performing SBE (Table 6). Majority of the students (82%) responded that they had never felt lumps in their breasts while 18% of the students had felt lumps during SBE (Table 5). Most of the students (92%) responded that they had never observed any changes in the shape of their nipple while 8% had observed changes in the shape of their nipple (Table 6). Additionally, 93% attested that they had had abnormal discharge from their nipple while 7% indicated that they never had. Few participants (16.3%) reported that they had experienced abnormal pain in the breast that continued even after the end of their menstruation or menstrual period. Some of the participants 11.7% (N=35) testified that they had felt lumps in their collarbones at least once while the rest 88.3 % (N=265) stated that they had not. Majority of the participants (85.7%) had felt lumps in their armpits while 14.3% had never felt lumps in their armpits (Table 6).

3.6 Further Steps taken after discovering warning signs during SBE

Results obtained after assessing for further steps taken after discovering warning signs during SBE and CBE show that 30.3% said that they saw a Doctor while 60.7% did not (Table 7). Few participants (23.7%) admitted that they did a laboratory screening whereas, 76.3% did not go for laboratory screening. Furthermore, 16.7% reported that they had removed the lumps in their breasts, armpit or collarbone while a significant number of participants (83.3%) did not (Table 7).

4. DISCUSSION

A poor understanding of risk factors and screening methods causes the women to rarely or never checking their breasts. Increasing breast cancer awareness in Ebonyi state, Nigeria is important, feasible and effective way of increasing the number of women who will receive timely clinical-breast examinations.

Our findings shows that significant number (P <0.001) of female undergraduate students of EBSU are aware of breast cancer. This is consistent with a previous research which revealed that people with higher education exhibited increased awareness level of breast cancer (Sreedharan et al., 2010; Norlaili et al., 2013; Sreedevi et al., 2014; Karadag et al., 2014).

Majority of the students showed noticeable gaps in their knowledge of risk factors for breast cancer. Most of the students were not aware that age, smoking, taking hard drugs, obesity and alcohol consumption are risk factors for breast cancer. This suggest that female undergraduate students of EBSU have poor knowledge of risk factors associated with breast cancer development. This is in line with previous study which disclosed that urban women showed a very poor knowledge level of the risk factors of breast cancer (Solikhah et al., 2019). Other previous studies have established that the level of breast cancer awareness is very low in several Asian and Western countries (Linsell et al., 2008; Tazhibi & Feizi, 2014; Elobaid et al., 2014). A previous contrasting study show that, the low level of awareness of the knowledge of the risk factors for breast cancer and low knowledge of the numerous screening methods were seen mostly among women with low educational levels (Hvidberg et al., 2014). Many studies have reported that Asian women have poor knowledge of breast cancer risk factors (Solikhah et al., 2019; Linsell et al., 2008; Tazhibi & Feizi, 2014; Islam et al., 2016). Our present study indicated a poorer knowledge of breast cancer risk factors.

It is best for women to feel and examine their breasts for consistency, size and shape, so that any deviation from normal would lead to questioning of breast associated disorders. Our results revealed that majority of female undergraduate student of EBSU were aware of the warning signs of breast cancer such as Redness of affected Breast, Irritation of Breast, Swelling of the Breast, Rash on Breast, Abnormal Nipple discharge, Lumps in Breast, Changes in the shape of Nipple, Lumps around collar bone, Abnormal pain in the breast that remains after period ends, Sore or wound on Breast. It also agrees with the study which reported that nurses demonstrated good knowledge of warning signs of breast cancer (Sathian et al., 2014). Previously reported that graduates were more aware of BSE, as well as the warning signs of breast cancer than others with lower educational levels (Sathian et al., 2014). This is not consistent with a study conducted on Nepalese women in which they proved low awareness of warning signs of breast cancer (Sathian et al., 2014).

Our study supports a study done in Saudi Arabia which states that awareness of breast cancer warning signs, such as breast lump, bleeding and/or nipple discharge, dimpling breast skin, changes in breast size and nipple pulling in are the most common identifiable symptoms of breast disorder (Radi, 2013). also reported that some women had poor knowledge that redness of breast skin and nipple rash are warning signs associated with cancer of the breast (Radi, 2013). Our findings are in agreement with Radi's report in Saudi Arabia, which publicised that females were aware that breast lump, nipple discharge and breast skin changes are common warning signs of breast cancer (Radi, 2013). Previous reports revealed that people with higher education showed an increase in the awareness level (Sreedharan et al., 2010; Norlaili et al., 2013; Sreedevi et al., 2014; Karadag et al., 2014).

SBE and CBE helps in early breast cancer detection which involves physical and visual inspection of one's own breasts to inspect for any indication of breast tumour.

A significant number of the undergraduate student were aware of SBE and CBE. Our findings also show that higher majority of the student practice SBE while insignificant number have practice CBE. Small number of the students examined their breast daily, weekly and monthly.

This finding is consistent with previous study which reported that there were very high awareness (93%) of breast-self-examination (Kudzawu et al., 2016). Kudzawu *et al.,* (2016) also reported that few participant practiced breast-self-examination weekly, which is consistent with our finding (Kudzawu et al., 2016). Other previous study in Egypt, revealed that only 5% of female students in university have knowledge of SBE while over 90% of the female participants have never practiced SBE (Salama et al., 2013).

Our findings revealed that few participants noticed some of the warning signs symptoms of breast cancer. Few of them detected Lump in their Breast, change in nipple, abnormal nipple discharge, abnormal breast pain that remains after menstrual period end, Lumps in collar bone, and Lumps in the armpit (Table 6). Regular breast examination of a woman individual breasts helps her to detect readily any changes occurring in the breast (Bhan & Jayaram, 2022). Various studies have reported that the majority of the advanced breast cancers were detected initially by the patients themselves based on the changes she discovered as lump, and other abnormal changes (Unger-Saldaña et al., 2015; Romanoff et al., 2017; Ginsburg et al., 2020). Radi previously reported that females in Saudi Arabia were aware that breast lump, nipple discharge and breast changes are recurrent warning signs for breast cancer (Radi, 2013). The commonest complaints in the breast are breast pain, breast masses, and nipple discharge (Macdonald, 2023). A substantial breast mass must be evaluated using various clinical breast exam (Macdonald, 2023).

The findings of current study revealed that majority of the participants never took any further step for further evaluation after discovering warning signs during SBE. Only 30.3% booked appointment with doctor, 27.3% did laboratory screening to confirm or rule out cancer whereas, 16.7% of the participants went further to remove lumps from the breast (Table 7). Once the warning signs is presented to a health care organization, the diagnostic services need to be activated to provide a prompt as well as accurate diagnosis (Ginsburg et al., 2020). The effective diagnoses and subsequent treatment of clinically noticeable breast cancer starts with clinical breast evaluation through taking of the medical history and there after performing an intensive physical examination, together with clinical-breast examination (CBE), followed by diagnostic breast imaging and pathologic evaluation of the tissue samples, -called triple test for breast diagnosis (Ginsburg et al., 2020; Vetto et al., 1995). Once accessible and high-quality services, are available for diagnoses and treatment of clinically apparent breast disease, screening programs must be activated for early detection as well as effective timely diagnosis.

5. CONCLUSION

This study indicate that the students have adequate awareness of breast cancer, suboptimal practice of SBE and/or CBE, suboptimal awareness of the early warning signs, and inadequate awareness of the risk factors, which critical to increasing the breast cancer burden. Public awareness campaign is necessary to overcome the increasing burden of breast disease.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image

generators have been used during writing or editing of this manuscript.

CONSENT AND ETHICAL APPROVAL

Ethical approval was obtained from Ebonyi State University's Ethical Committee before the research was carried out. Consent for participants was obtained. All information was kept confidential and anonymous.

ACKNOWLEDGMENTS

The authors wish to appreciate Ebonyi State University for providing enabling environment for this research.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Abulkhair, O. A., Al Tahan, F. M., Young, S. E., Musaad, S. M., & Jazieh, A. R. (2010). The first national public breast cancer screening program in Saudi Arabia. *Annals of Saudi Medicine, 30*(5), 350-357.

Albeshan, S. M., Hossain, S. Z., Mackey, M. G., & Brennan, P. C. (2020). Can breast self-examination and clinical breast examination along with increasing breast awareness facilitate earlier detection of breast cancer in populations with advanced stages at diagnosis? *Clinical Breast Cancer, 20*(3), 194-200.

Bhan, A. D., & Jayaram, J. (2022). Screening, self-examination and awareness in breast cancer. In *Breast Cancer: Comprehensive Management* (pp. 587-600). Singapore: Springer Nature Singapore.

Elobaid, Y. E., Aw, T. C., Grivna, M., & Nagelkerke, N. (2014). Breast cancer screening awareness, knowledge, and practice among Arab women in the United Arab Emirates: A cross-sectional survey. *PLOS ONE, 9*(9), e105783.

Endrikat, J., Schmidt, G., Oak, B., Shukla, V., Nangia, P., Schleyer, N., Crocker, J., & Pijnapppel, R. (2024). Awareness of breast cancer risk factors in women with vs. without high breast density. *Patient Preference and Adherence*, 1577-1588.

Ginsburg, O., Yip, C. H., Brooks, A., et al. (2020). Breast cancer early detection: A phased approach to implementation. *Cancer, 126*, 2379-2393.

Hassan, L. M., Mahmoud, N., Miller, A. B., et al. (2015). Evaluation of effect of self-examination and physical examination on breast cancer. *The Breast, 24*(4), 487-490.

Heng, R., & Bae, S. H. (2021). The breast cancer awareness and breast self-examination practices among Cambodian women. *Cambodia Journal of Public Health (CJPH) of the School of Public Health at NIPH, 2*(10).

Hvidberg, L., Pedersen, A. F., Wulff, C. N., & Vedsted, P. (2014). Cancer awareness and association with socio-economic position: Results from a population-based study in Denmark.

Islam, R. M., Bell, R. J., Billah, B., Hossain, M. B., & Davis, S. R. (2016). Awareness of breast cancer and barriers to breast screening uptake in Bangladesh: A population-based survey. *Maturitas, 84*, 68-74.

Karadag, G. Ü., Gungormus, Z., Surucu, R., Savas, E., & Bicer, F. (2014). Awareness and practices regarding breast and cervical cancer among Turkish women in Gazientep. *Asian Pacific Journal of Cancer Prevention, 15*(3).

Khaliq, N. I., Mustehsan, Z. H., Rashid, H. A., Khadija, S. H., Waseem, N. A., & Waseem, H. A. (2021). Knowledge, attitude, risk factors & screening practices regarding breast cancer among women in Islamabad. *Pakistan Journal of Medical Health Sciences, 15*(6), 2133-2137.

Kudzawu, E., Agbokey, F., & Ahorlu, C. S. (2016). A cross-sectional study of the knowledge and practice of self-breast examination among market women at the Makola shopping mall, Accra, Ghana. *Advances in Breast Cancer Research, 5*(3), 111-120.

Linsell, L., Burgess, C. C., & Ramirez, A. J. (2008). Breast cancer awareness among older women. *British Journal of Cancer, 99*(8), 1221-1225.

Macdonald, H. R. (2023). Management of benign breast disease. In *Handbook of Gynecology* (pp. 485-493). Cham: Springer International Publishing.

Maharjan, R. K., Panthee, B., & Awale, S. (n.d.). Awareness, attitude and practices regarding breast cancer screening among community women.

Norlaili, A. A., Fatihah, M. A., Daliana, N. F., & Maznah, D. (2013). Breast cancer awareness of rural women in Malaysia: Is it the same as in the cities? *Asian Pacific*

Journal of Cancer Prevention, 14(12), 71614.

Obaji, N. C., Elom, H. A., Agwu, U. M., Nwigwe, C. G., Ezeonu, P. O., & Umeora, O. U. (2013). Awareness and practice of breast self-examination among market women in Abakaliki, South East Nigeria. *Annals of Medical and Health Sciences Research, 3*(1), 7-12.

Oluwakemi, O. E., Aluko, J. O., & Anorkwuru, R. (2022). Knowledge, attitude and practice of breast self-examination in Nigeria: A 10-year systematic review.

Radi, S. M. (2013). Breast cancer awareness among Saudi females in Jeddah. *Asian Pacific Journal of Cancer Prevention, 14*(7), 4307-4312.

Romanoff, A., Constant, T. H., Johnson, K. M., et al. (2017). Association of previous clinical breast examination with reduced delays and earlier-stage breast cancer diagnosis among women in Peru. *JAMA Oncology, 3*(11), 1563-1567.

Salama, H., Elsebai, N., Abdelfatah, F., Shoma, A., & Elshamy, K. (2013). Effects of peer education on the knowledge of breast cancer and practice of breast self-examination among Mansoura University Female Students. *J Am Sci, 9*(10), 253-261.

Sathian, B., Nagaraja, S. B., Banerjee, I., et al. (2014). Awareness of breast cancer warning signs and screening methods among female residents of Pokhara valley, Nepal. *Asian Pacific Journal of Cancer Prevention, 15*(11), 4723-4726.

Solikhah, S., Promthet, S., & Hurst, C. (2019). Awareness level about breast cancer risk factors, barriers, attitude and breast cancer screening among Indonesian women. *Asian Pacific Journal of Cancer Prevention, 20*(3), 877.

Sreedevi, A., Quereshi, M. A., Kurian, B., & Kamalamma, L. (2014). Screening for breast cancer in a low-middle income country: Predictors in a rural area of Kerala, India. *Asian Pacific Journal of Cancer Prevention, 15*(5), 1919-1924.

Sreedharan, J., Muttappallymyalil, J., Venkatramana, M., & Thomas, M. (2010). Breast self-examination: Knowledge and practice among nurses in United Arab Emirates. *Asian Pacific Journal of Cancer Prevention, 11*(3), 651-654.

Tazhibi, M., & Feizi, A. (2014). Awareness levels about breast cancer risk factors, early warning signs, and screening and therapeutic approaches among Iranian adult women: A large population-based study using latent class analysis. *BioMed Research International, 2014*, 306352.

Unger-Saldaña, K., Miranda, A., Zarco-Espinosa, G., et al. (2015). Health system delay and its effect on clinical stage of breast cancer: Multicenter study. *Cancer, 121*(13), 2198-2206.

Vetto, J., Pommier, R., Schmidt, W., et al. (1995). Use of the “triple test” for palpable breast lesions yields high diagnostic accuracy and cost savings. *The American Journal of Surgery, 169*(5), 519-522.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/124116