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Breast Self-Examination as a Preventive Health Strategy: Knowledge–Practice Gaps among Undergraduate Female Students in a Nigerian Tertiary Institution

AUTHOR(S): ABDULMUMEEN Ibrahim O, ABIODUN Lawal S., YAHAYA Umar, IBRAHEEM Mulikat A. , AJIDE Oluwakemi,

Abstract

Breast Self-Examination Play a core function in the early detection and prevention of breast cancer, breast health literacy is vital. Public health concerns remain surrounding breast cancer, which is one of the top causes of cancer-related fatalities. The aim of this study was to assess the level of knowledge surrounding breast self-examination (BSE) among the female undergraduate students of Al-Hikmah University in Ilorin, Kwara State. The study used a cross-sectional descriptive research, and a total of 366 participants were surveyed, which resulted in a response rate of 100%. The quantitative data analysis was performed using SPSS version 26, and descriptive statistics (percentages, tables, figures) and the chi-square test was used to analyse the data at a coefficient of 0.05. Of the total participants, 45.1 percent were aged 16 to 20 years, and 28.4 percent were third year students. Most of the participants (84.4%) had knowledge of BSE, which was mostly received from health care workers (47.3%). Furthermore, BSE was important to 46.4% of the participants. The early signs of breast cancer detection were recognized alongside shape/color changes to the breast (78.4%), lumps in the breast/armpit (76.8%), and nipple changes (74%). Knowledge gaps surrounding BSE were captured through unavailability of educational resources (59%), fear surrounding diagnosis (53.8%), preferred hospital examinations (57.7%), absence of BSE instruction (41.3%), and not having enough time to do the examination (43.4%). The study underscores the need for tailored health education targeting female undergraduates. Efforts should address barriers hindering BSE practice, including resource accessibility, fear mitigation, and provision of clear instructions. Empowering students with accurate knowledge and practical skills can significantly enhance early breast cancer detection and management within this demographic.

Keywords: Knowledge, Breast-Self Examination, Undergraduate Female Students,

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About Author

Author(s): **ABDULMUMEEN Ibrahim O**
Department of Medical Surgical Nursing,
Faculty of Nursing Sciences,
College of Health Sciences,
Al-Hikmah University, Ilorin, Nigeria.
ibrahimopeyemi007@gmail.com
ORCID ID: 0009-0003-6198-682X

ABIODUN Lawal S.
Department of Public Health Nursing,
Faculty of Nursing Sciences,
College of Health Sciences,
Al-Hikmah University, Ilorin, Nigeria.
aslawal@alhikmah.edu.ng

YAHAYA Umar
Department of Nursing Science,
Faculty of Allied Health Sciences,
Federal University of Health Sciences Ila-Orangun, Nigeria
umar.yahaya@fuhsi.edu.ng

IBRAHEEM Mulikat A.
Department of Public Health Nursing,
Faculty of Nursing Sciences,
College of Health Sciences,
Al-Hikmah University, Ilorin, Nigeria.
maibraheem@alhikmah.edu.ng

AJIDE Oluwakemi
Department of Medical Surgical Nursing,
Faculty of Nursing Sciences,
College of Health Sciences,
Al-Hikmah University, Ilorin, Nigeria.

Introduction

The early detection and prevention of breast cancer, an illness whose effects may only be severe if left untreated, depend heavily on breast health literacy. Fundamentally, breast health literacy includes a comprehensive knowledge of the complex anatomy and physiological processes of the breast as well as a sharp awareness of the risk factors, symptoms, and screening options for breast cancer, including mammography and breast self-examination (BSE) (Israel et al., 2023). The importance of breast health literacy cannot be emphasised because it provides individuals, particularly women, with the knowledge needed to actively monitor and control their breast health. Individuals can use BSE to detect any changes or anomalies in their breasts, including the existence of suspicious lumps, which can be a sign of breast cancer (Orji et al., 2020). Such proactive engagement with one's breast health is critical because it frequently leads to earlier discovery and subsequent medical intervention, which improves treatment outcomes and overall survival.

However, achieving widespread breast health literacy and promoting the adoption of BSE practices require concerted efforts, particularly in addressing cultural beliefs, socioeconomic disparities, and disparities in health literacy (Jayasekera & Mandelblatt, 2020; Wang et al., 2022). Tailored educational interventions that are sensitive to these diverse factors can significantly enhance the uptake of BSE and contribute to the early detection of breast cancer:a goal that holds particular significance in regions where access to healthcare resources may be limited.

Research indicates that while BSE can be a valuable component of breast health maintenance, its effectiveness relies heavily on the individuals' understanding of proper technique and frequency of examination (Udoh et al., 2020b). Therefore, comprehensive breast health literacy initiatives must emphasize not only the importance of BSE but also provide clear, accessible guidance on how to perform it correctly. Moreover, it's essential to acknowledge that BSE is not a substitute for clinical breast examinations or mammography but rather complements these screening methods. Regular BSE, when performed in conjunction with other screening modalities, can enhance early detection efforts and empower individuals to take an active role in their breast health (Chia et al., 2023).

Breast cancer is a worldwide health issue that disproportionately affects women (Britt et al., 2020). A vital preventive strategy that greatly raises survival rates and enhances treatment results is early diagnosis using BSE. Nonetheless, research continuously shows a worrisome lack of awareness regarding BSE, particularly among young women (Sadoh et al., 2021). A significant portion of young women, including college students, frequently lack understanding and regular practice of BSE, despite the well-established advantages of early detection (Dinegde et al., 2020). Accordingly, this disparity might lead to postponed diagnoses, breast cancer that is already more advanced when it is discovered, and eventually poor treatment results for women (van der Veer et al., 2023).

Within the context of Al-Hikmah University, Ilorin, where a complex interplay of cultural, educational, and socio-economic influences may shape health-related behaviours, understanding the level of awareness and engagement in proactive breast health measures among female undergraduate students is of paramount importance. This research endeavour seeks to fill this crucial gap in knowledge by investigating the comprehension and implementation of BSE among this demographic group. By drawing upon recent research findings, the study aims to elucidate the factors that influence knowledge and behaviour in this area, ultimately informing the development of targeted interventions aimed at fostering breast health awareness and preventative measures among Al-Hikmah University, Ilorin's female student population.

The unique challenges faced by undergraduate female students merit specific attention. This demographic represents a crucial stage in life where lifelong health behaviours are often established. Yet, the demands of academia, social pressures, and a lack of targeted health education programs may contribute to a low priority placed on self-breast examination. This study seeks to address this intricate problem by examining the knowledge of BSE among undergraduate female students at Al-Hikmah University, Ilorin (Adeta campus). By doing so, the research aims to uncover the factors contributing to the observed gap, shedding light on the intricacies of breast health awareness within this specific context. Identifying these factors is essential for tailoring effective health interventions that resonate with the experiences and challenges faced by females in the university setting, ultimately contributing to improved breast health outcomes and a reduction in the burden of breast cancer in this demographic.

Materials and Methods

This study used a cross-sectional descriptive research design. This methodology works well for evaluating undergraduate female students at Al-Hikmah University in Ilorin's knowledge of breast self-examination and breast health literacy. It is suitable for determining the present level of breast health literacy within the target population since it offers a snapshot of the population at a certain moment in time.

This research study was carried out at Adeta Campus, Al-Hikmah University, Ilorin, located in Ilorin, Nigeria. The target population for this study comprises undergraduate female students enrolled at Adeta Campus, Al-Hikmah University, Ilorin, Nigeria. The inclusion criteria were the female students aged 16 years and above who were enrolled as undergraduates in the university as at the time of the study. The Taro Yamane Formula was used to calculate the sample size. With a 10% attrition rate, the sample size was calculated to be 333 in order to account for the expected non-response. Therefore, the final sample size was rounded up to 366 individuals in order to guarantee proper representation and account for possible non-responses. To choose volunteers who fit particular requirements pertinent to the study's goals, purposive sampling was used. The following inclusive requirements must be met: female undergraduate students who are currently enrolled at Al-Hikmah University's Adeta Campus in Ilorin, Nigeria, and who are at least 16 years old being open to taking part in the research. Exclusive Requirements: Students who are male or do not identify as female, those who are not enrolled at Al-Hikmah University's Adeta Campus in Ilorin, Nigeria, University female undergraduates who refuse to take part in the study.

This research utilized a structured questionnaire. It gathered demographic data such as age, educational level, place, mother tongue, ethnicity, and religious affiliation. Additionally, it contained specific questions with predetermined answers, centred on the topic of breast self-examination. The self-structured questionnaire was divided into three sections: Section 1, 2, and 3.

Section A: Demographic Information

Section B: Knowledge about Breast Health

Section C: Factors influencing Knowledge of BSE and the intention to perform BSE

The instrument's validity was ensured through a multi-step process. Initially, research expert examined the instrument, confirming its face validity. Following this suggestions and corrections, appropriate amendments were made to enhance its effectiveness. A pilot study was conducted among a small sample of undergraduate female students to assess the reliability. The reliability of the questionnaire was determined using test-retest reliability analysis.

A self-structured questionnaire was designed and converted to an online Google form, consisting of the three sections (1, 2 and 3). The link to the online Google form was then sent to participants' WhatsApp to respond. The feedback from each respondent was collected via the mail which was used to design the online form. There was an aspect in the questionnaire that sought to request the consent of individual respondents. Respondent's informed consent was obtained before proceeding with the questionnaire. Data from the responses were collected from Google Forms and exported into a Microsoft Excel spreadsheet. The collected data was then analysed using the Statistical Package for the Social Sciences (SPSS) software. Data was analyzed using both descriptive and inferential Statistics. Result was presented using tables and charts. Inferential Statistics in form of a Chi-square test was used to test hypothesis.

The relevant authorities requested and approved the necessary authorisation to conduct the research on university property. The goals and purpose of the study were explained in detail to the respondents in writing. Additionally, they had enough of time to properly comprehend the objectives of the study and their rights to participate or not. They were made fully aware of their right to leave the study at any time if it made them uncomfortable. Additionally, assurances of anonymity and confidentiality were given.

Results

Findings from the study revealed that 165 (45.1%) respondents were between 16 to 20 years, 148 (40.4%) were between 21 to 25 years while 53 (14.5%) were 26 years and above. 104 (28.4%) were in 300 level, 72 (19.7%) were in 400 level, 68 (18.6%) were in 500 level while 66 (18%) were in 200 level and 56(15.3%) were in 100 level as shown in Table 1. Majority (89.3%) were Muslims while 36(9.8%) were Christians and 3(0.8%) were traditionalist. A large proportion (86.6%) of the respondents had no history of breast cancer in the family. However, out of the 12.8% of the respondents who had history of breast cancer in the family, 18(38.3%) affirmed that it was their aunt, 11(23.4%) affirmed that it was their grandmother, 9 (19.1%) affirmed that they belonged to other categories while 4 (8.5%), 3 (6.4%) and 2 (4.3%) affirmed that it was their cousin, sister and mother respectively.

Additionally, from the research findings as highlighted in Figure 1 it was deduced that 88% of the respondents had no history of breast cancer while only 12% had history of previous cancer

Table 1: Socio-demographic Characteristics of Respondents (n = 366)

Variables	Response	Frequency	Percentage (%)
Age (in years)	16-20	165	45.1
	21-25	148	40.4
	26 and above	53	14.5
Level	100level	56	15.3
	200level	66	18.0
	300level	104	28.4
	400level	72	19.7
	500level	68	18.6
Religion	Christianity	36	9.8
	Islam	327	89.3
	Traditional	3	0.8
Previous family history	Yes	47	12.8

of breast cancer	No	319	86.6
If yes, who	Grandmother	11	23.4
	Aunt	18	38.3
	Cousin	4	8.5
	Sister	3	6.4
	Mother	2	4.3
	Others	9	19.1

Level of knowledge of Breast Self-Examination practices and procedures among undergraduate female students of Al-Hikmah University Ilorin

As shown in Table 2, findings from the study showed that, majority (84.4%) have heard of breast self-examination, 345(94.3%) affirmed that early detection of breast cancer improves chances of survival. 170(46.4%) affirmed that breast self-examination should be performed by females only, 165(45.1%) affirmed that it should perform by both male and female while 28(7.7%) do not know and 3(0.8%) affirmed that it should be performed by males only. A large proportion (95.1%) of the respondents affirmed that breast self-examination is important in early detection of breast cancer and the duration of performance as affirmed by respondents were; monthly (53.8%), weekly (30.6%), once in three months (11.7%), once in six months (3.3%) and yearly (0.5%). 151(41.3%) respondents agreed that breast self-examination should be performed one week after the end of menses, 119(32.5%) affirmed that they do not know while 71(19.4%) affirmed on the first day of the month and 25(6.8%) affirmed during menstruation. With regards to the most appropriate place to perform breast self-examination; 132(40%) affirmed to all the options provide by the researcher, 120 (32.8%) agreed with in front of the mirror, 105(28.7%) affirmed with when lying down while 9(2.5%) agreed with under the shower.

Furthermore, majority affirmed that; changes in the shape and colour of the breast are signs of breast cancer (78.4%), lumps in the breast and around the armpit are signs of breast cancer (76.8%) and nipple discharge and retraction are signs of breast cancer (74%). However, more than half (67.2%) affirmed that they would prefer to do breast self-examination themselves, 70(19.1%) affirmed that they would prefer by the doctor while 50(13.7%) affirmed they would prefer by the nurse. Also, majority (96.4%) affirmed that they would go to the healthcare facility if signs of breast cancer are detected while only 13(3.6%) affirmed that they would go to patent medicine store on detection of breast cancer.

Table 2: Extent of knowledge regarding self-breast examination among female Undergraduate of Al-Hikmah University, Ilorin (n=366)

Variable	Response	Freq.	(%)
Have you heard of breast self-examination before?	Yes	309	84.4
	No	5	1.4
	No Response	52	14.2
Does early detection of breast cancer improve chances of survival?	Yes	345	94.3
	No	21	5.7
Who should perform BSE?	Both	165	45.1

	Females only	170	46.4
	Males only	3	0.8
	I don't know	28	7.7
Is BSE important in the early detection of breast cancer or lump?	Yes	348	95.1
	No	18	4.9
How often should breast self-examination be performed?	Monthly	197	53.8
	Once in six months	12	3.3
	Once in three months	43	11.7
	Weekly	112	30.6
	Yearly	2	0.5
When should breast self-examination performed?	During menstruation	25	6.8
	On the first day of each month	71	19.4
	One week after end of menses	151	41.3
	I don't know	119	32.5
Where is the most appropriate place to perform BSE?	In front of the mirror	120	32.8
	When lying down	105	28.7
	Under the shower	9	2.5
	All of the above	132	40.0
Changes in the shape and colour of the breast are the signs of breast cancer:	Yes	287	78.4
	No	79	21.6
Lumps in the breast and around the armpit are the signs of breast cancer:	Yes	281	76.8
	No	85	23.2
Nipple discharge and retraction are the signs of breast cancer:	Yes	271	74.0
	No	95	26.0
How do you prefer your breast examination to be done?	By a doctor	70	19.1
	By a nurse	50	13.7
	By yourself	246	67.2
Where will you go, if there are any symptoms of breast cancer?	Healthcare facility	353	96.4
	Patent medicine store	13	3.6

Findings from the study also revealed that the source of information about breast self-examination among respondents were health care professional (47.3%), mass media (18.6%), family members (15%), friend and colleagues (9.6%) and others (4.9%), as illustrated in Figure 1

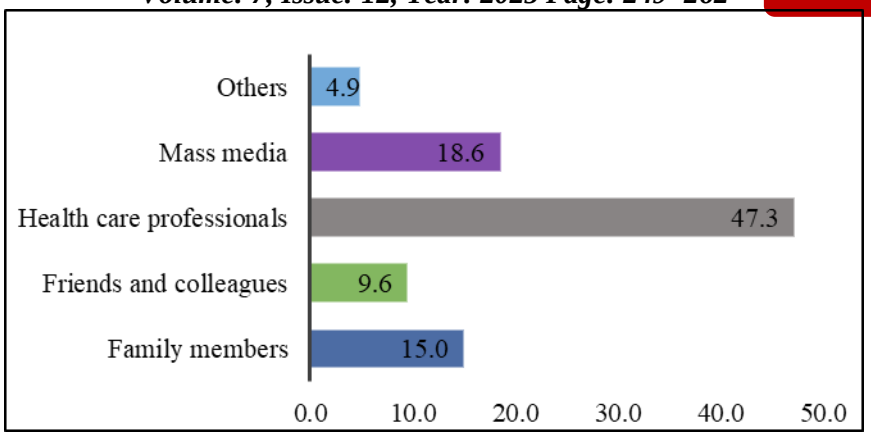

Fig 1: Source of information on breast self-examination among respondents

Findings from the study revealed that the extent of knowledge on breast self-examination as affirmed by the respondents were fair (49.7%), good (44%), I do not know (4.1%) and poor (2.2%) as shown in Figure 2

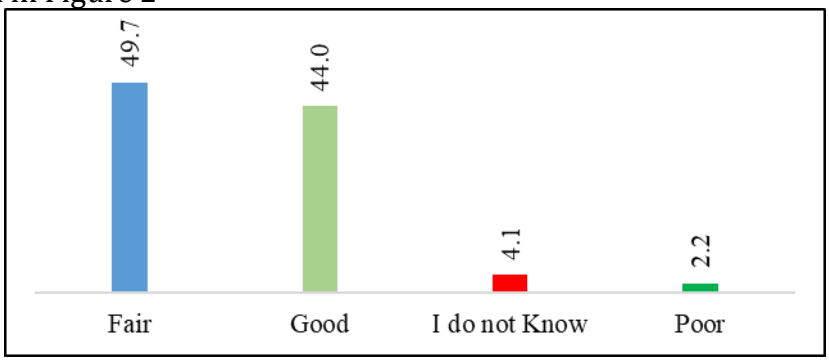

Fig 2: Extent of knowledge on breast self-examination among respondents

Factors influencing knowledge of breast self-examination among undergraduate female students of Al-hikmah University, Ilorin

The study findings unveiled several significant factors influencing the knowledge of breast self-examination (BSE) among respondents. Predominantly, more than half of the participants identified access to health educational materials on breast cancer (59%), fear of a breast cancer diagnosis (53.8%), and a belief that BSE is best conducted in a hospital setting (57.7%) as influential factors. Conversely, most respondents did not perceive previous personal experiences with breast cancer (72.1%), the loss of family members due to breast cancer (79.5%), insufficient information on how to perform BSE (53%), and the time required for BSE (51.9%) as significant influences on their BSE knowledge.

Table 3: Factors Influencing the Knowledge of Breast Self-Examination among Female Undergraduates of Al-Hikmah University, Ilorin

Variables	Yes		No		Indifferent	
	Freq.	%	Freq.	%	Freq.	%
Previous history of breast cancer	79	21.6	264	72.1	23	6.3
Course of study	170	46.4	173	47.3	23	6.3
Loss of family member due to breast cancer	55	15.0	291	79.5	20	5.5
Access to health educational materials on breast cancer	216	59.0	131	35.8	19	5.2
Lack of adequate information on how it is being conducted	151	41.3	194	53.0	21	5.7
Time involve in conducting breast self-	159	43.4	190	51.9	17	4.6

examination							
Fear of breast cancer diagnosis	197	53.8	154	42.1	15	4.1
Believe it is best done in the hospital	211	57.7	141	38.5	14	3.8

Furthermore, approximately half of the respondents acknowledged the influence of their academic discipline (46.4%), lack of sufficient guidance on BSE procedures (41.3%), and time constraints associated with conducting BSE (43.4%) on their BSE practices. These findings underscore the multifaceted nature of factors affecting both the knowledge and practice of BSE among the study participants.

Research Hypotheses

Ho_1: There is no significant relationship between previous history of breast cancer and extent of knowledge on breast self-examination among respondents

Inference: Based on the chi-square analysis of the relationship between previous history of breast cancer and extent of knowledge on breast self-examination among respondents, it can be deduced that previous history of breast cancer has a significant influence of extent of knowledge on breast self-examination among respondents with p-value < 0.05 [P-value = 0.000], as shown in Table 4.

Table 4: Statistical illustration of the relationship between previous history of breast cancer and extent of knowledge on breast self-examination among respondents

		Extent of Knowledge on Breast Self-Examination					Chi-Square X^2	df	P-Value	Remark
		Fair	Good	Undecided	Poor	Total				
Previous History of Breast Cancer or Lump		0	3	0	0	3	38.942[a]	8	0.000	Significant P-value < 0.05
	No	177	134	6	5	322				
	Yes	8	24	6	3	41				
Total		185	161	12	8	366				

Ho_2: there is no significant relationship between academic level and extent of respondents' knowledge of breast self-examination.

Inference: Based on the chi-square analysis of the relationship between academic level and extent of respondents' knowledge of breast self-examination, it can be deduced that academic level of respondent have a significant influence on the extent of respondents knowledge on breast self-examination

Table 5: Statistical Illustration of the relationship between academic level and extent of respondents' knowledge on breast self-examination

		Extent of Knowledge on Breast Self-Examination					Chi-square X^2	df	P-value	Remark
		Fair	Good	Undecided	Poor	Total				
Level	**100 level**	40	20	2	1	63	62.049[a]	4	0.000	Significant P-value < 0.05
	200 level	35	19	7	5	66				
	300 level	54	48	1	1	104				
	400 level	28	44	0	0	72				
	500 level	28	30	2	1	61				
Total		185	161	12	8	366				

Discussion

This study involved a total of 366 participants, yielding a 100% response rate. The majority, 165 (45.1%), were aged between 16–20 years, while 104 (28.4%) were in their third year of study. Most respondents, representing 89.3%, identified as Muslims, reflecting the religious composition of Al-Hikmah University. Similar demographic patterns were observed in a study conducted by Getu et al. (2022) on breast self-examination knowledge among female students at Addis Ababa University, Ethiopia, which also reported a 100% response rate. In their research, 85.3% of participants were between 20–22 years of age, and 41.8% were second-year students. The predominance of young respondents in both studies indicates that BSE education should be emphasized early in adulthood, as this age group represents a key stage for developing lifelong health behaviours. Early exposure to preventive health information within university settings can help instill proactive attitudes toward breast health maintenance.

The results of this study demonstrated that a significant percentage of participants (84.4%) knew what breast self-examination (BSE) was. The majority of information came from healthcare professionals (47.3%), followed by the media (18.6%), family members (15%), friends and coworkers (9.6%), and other smaller sources (4.9%). This is consistent with research by Asmare et al. (2022), which found that women in Gondar town, Ethiopia, mostly got their information about BSE from radio and television (43.2%) and medical facilities (30.8%). In the current survey, 46.4% of respondents recognised the value of early detection in boosting survival rates. However, this percentage is lower than that found by Getu et al. (2022), in which 69.3% of participants recognised the importance of early identification in breast cancer survival. Most responders accurately identified breast cancer symptoms, such as changes in breast shape and colour (78.4%), lumps in the breast or armpit (76.8%), and nipple discharge or retraction (74%). These findings contrast with those of Sarker et al. (2022), who found that participants had reduced recognition rates for same symptoms, implying that educational exposure and healthcare access influence knowledge variations. Despite widespread awareness of BSE, nothing was known regarding the proper method and frequency of examinations. This disparity highlights the necessity of ongoing education that emphasises both theoretical comprehension and hands-on BSE method demonstration.

Several factors were identified as determinants of BSE knowledge among respondents. The most notable were lack of procedural information (41.3%) and fear of discovering a possible cancer diagnosis (53.8%). These findings agree with Sarker et al. (2022), who reported limited knowledge and fear as common barriers to regular BSE. Other factors observed in this study include inadequate access to educational materials (59%), belief that BSE should only be done in hospitals (57.7%), and time constraints (43.4%). These issues reflect both informational and emotional barriers that limit regular practice and highlight the need for continuous breast health education among young women**.**

Conclusion

Breast health literacy plays a vital role in the early detection and prevention of breast cancer. This study revealed significant awareness of BSE among female undergraduate students at Al-Hikmah University, Ilorin. The majority (84.4%) of respondents were knowledgeable about BSE, and healthcare professionals were their primary source of information. However, the study also identified notable gaps in detailed knowledge, including procedural understanding and the correct timing of examination. Factors such as inadequate access to educational materials (59%), fear of discovering cancer (53.8%), reliance on hospital-based practice (57.7%), limited procedural knowledge (41.3%), academic discipline (46.4%), and time

constraints (43.4%) were major influences on knowledge and practice. These findings demonstrate the need for continuous, comprehensive health education aimed at improving knowledge, reducing fear, and promoting consistent self-examination practices. Empowering young women with the right information and skills will enhance early detection and ultimately improve breast cancer outcomes

Recommendations

Based on the research findings, the following recommendations were made;

1. Training and retraining of health care personnel
2. Health education on breast self-examination
3. Demonstration on how health education is conducted
4. Provision of educational materials on breast cancer and breast self-examination
5. All undergraduate female students should be given access to breast self-examination educational materials
6. Undergraduates female students with history of breast cancer should be counseled and psychologically reassured on the importance of breast self-examination
7. Promotion of breast cancer awareness day among undergraduates students in order to provide a platform where there concerns and issues can be addressed
8. Male undergraduates should also be taught how to perform breast self-examination

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