



## Perceptions and Knowledge of Breast Cancer and Mammography Among Female Health Science Students: A Qualitative Study

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### KEYWORDS

Breast cancer, awareness, breast self-examination, early detection, risk factors, female students.

### ABSTRACT:

**Background:** Breast cancer remains one of the leading causes of cancer-related morbidity and mortality among women worldwide. Early detection through awareness of symptoms, risk factors, and Breast Self-Examination (BSE) plays a vital role in reducing disease burden.

**Objective:** This study aimed to assess the knowledge and awareness regarding breast cancer symptoms, risk factors, prevention, early detection, Breast Self-Examination (BSE) and mammography among female students in selected institutions.

**Methods:** A descriptive cross-sectional study was conducted among 50 female students from selected institutions. Data were collected using a structured questionnaire covering socio-demographic characteristics, family history, sources of information, knowledge of symptoms and risk factors, and awareness of prevention and early detection practices. Data were analyzed using descriptive statistics and presented as frequencies and percentages.

**Results:** Among the 50 participants, 52% were aged 26–30 years and 62% belonged to Health Sciences. While 74% reported awareness of breast cancer symptoms, only 46% had heard of breast cancer overall. Knowledge regarding risk factors and symptom combinations varied among participants. Regarding prevention, 38% believed breast cancer is preventable, while 32% were unsure. Only 14% recognized the importance of early detection. Although 56% were aware of BSE, only 38% knew how to perform it correctly. Additionally, 52% had already undergone a mammogram, while 24 participants had not undergone mammography due to fear, lack of awareness, cost issues, lack of time, and being too young for the mammography test.

**Conclusion:** The study revealed moderate awareness but significant gaps in comprehensive knowledge, particularly regarding early detection and correct BSE practices. Targeted educational interventions within academic institutions are essential to improve breast cancer awareness and promote preventive health behaviors among young women.

### INTRODUCTION

Breast cancer is the most frequently diagnosed cancer among women worldwide and remains a leading cause of cancer-related mortality (Abuabed et al., 2025; Sung et al., 2021). According to global cancer statistics, the incidence of breast cancer continues to increase, particularly in low- and middle-income countries, where late-stage presentation and limited awareness significantly affect survival outcomes (World Health

Organization, 2023). Early detection through appropriate screening and awareness strategies plays a crucial role in reducing morbidity and mortality associated with the disease (Siegel et al., 2024). Routine performance of BSE is recommended for females above 20 years (Johnson, 2019).

Adequate knowledge of breast cancer symptoms and risk factors is essential for promoting early diagnosis. Common warning signs include a lump in the breast,



nipple discharge, breast pain, skin dimpling, and changes in breast shape. Established risk factors such as family history, increasing age, obesity, and smoking have been widely documented in epidemiological studies (Bray et al., 2021; Sung et al., 2021). However, studies among young women and university students indicate persistent gaps in knowledge regarding these risk factors and symptoms (Albayrak and Cengiz, 2024).

Breast Self-Examination (BSE) is considered a simple, low-cost, and non-invasive method that enhances breast health awareness and encourages early medical consultation (Johnson, 2019). Although BSE does not replace mammography or clinical breast examination, it promotes familiarity with normal breast structure and facilitates early identification of abnormalities (WHO, 2023). Despite its importance, awareness and correct practice of BSE remain inadequate among young women, even in health-related academic settings (Gümüş and Küçükkaya, 2026). In contrast, mammography effectively screens asymptomatic women and can detect tumors one to two years earlier (Al-Sakkaf and Basaleem, 2016).

University students represent a critical population for breast cancer education, as this stage of life is formative for long-term health behaviors. Assessing their knowledge, perceptions, and practices is essential for identifying educational gaps and designing targeted interventions. Therefore, the present study was designed to assess the knowledge, awareness, and understanding of breast cancer symptoms and risk factors among female students from Health and Non-Health Science streams at selected institutions.

## METHODOLOGY

### Study Design

A descriptive cross-sectional study was conducted from November 2025 to March 2026 at SN Superspeciality Hospital and Jansewa Hospital, Sri Ganganagar, Rajasthan, India, under the guidance of Dr. Gurvinder Singh (MD Radiodiagnosis). The study assessed knowledge, perceptions, attitudes, and practices regarding breast cancer and mammography among female students.

### Study Population and Sampling

The study included female undergraduate students, postgraduates, interns, and female professionals from Nursing, Physiotherapy, Medical Laboratory Technology, and Allied Health Sciences aged 18–30 years. Purposive and stratified sampling (where applicable) was used to ensure representation from different academic programs and years.

Inclusion Criteria was (i) female students aged 18–30 years, (ii) currently enrolled in health science programs (UG/PG/Intern), (iii) willing to participate with written informed consent, and (iv) able to understand either English or Hindi language of questionnaire

Exclusion Criteria was (i) male participants, (ii) unwilling participants, (iii) those who filled incomplete questionnaires, and (iv) participants who had undergone formal breast cancer training within the last six months.

### Data Collection Tool

Data were collected using a pre-designed, structured, self-administered questionnaire (case proforma) prepared in both English and Hindi. The questionnaire consisted of five sections. Section A included demographic details such as age, educational stream, year of study, residence, marital status, family history of breast cancer, and source of information. Section B assessed knowledge regarding breast cancer, including symptoms, risk factors, preventive measures, early detection methods, and awareness of breast self-examination. Section C evaluated perception and attitude through Likert-scale statements related to breast cancer and mammography. Section D focused on practices, including breast self-examination, participation in awareness programs, clinical breast examination, and mammography history. Section E provided an optional open-ended section for suggestions to improve awareness.

### Reliability and validity test

The questionnaire was tested by experts in Radiodiagnosis and Community Medicine. A pilot study (10–15 participants) was conducted to assess reliability and validity. Reliability analysis showed a Cronbach's alpha of 0.927, that indicated excellent internal consistency (>0.70 acceptable). Validity testing showed statistically significant correlations at the 0.001 level,



which confirmed that all items were valid and aligned with study objectives.

## RESULTS AND DISCUSSION

A total of 50 female students participated in the study. As evident in table 1, the majority of participants, 26 (52.0%), were aged 26–30 years, followed by 15 (30.0%) aged 18–21 years and 9 (18.0%) aged 22–25 years.

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

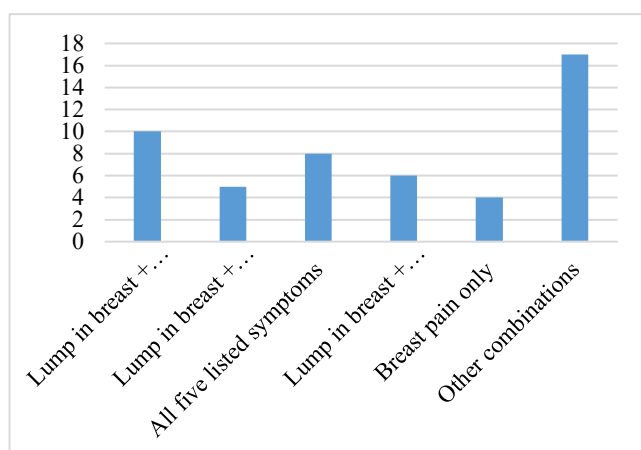
Socio-demographic factors		Frequency
		Total (N=50)
Age	18-21	15
	22-25	9
	26-30	26
Educational Stream	Health Sciences	31
	Non-Health Sciences	19
Year of Study	1st	9
	2nd	11
	3rd	8
	Final	10
	Intern	12
Institution	Jansewa Hospital	23
	SN Superspeciality Hospital	27
Residence	Rural	21
	Semi-Urban	13
	Urban	16
Marital Status	Married	22
	Single	28

Regarding educational stream, 31 participants (62.0%) were from Health Sciences, while 19 (38.0%) belonged to Non-Health Sciences. In terms of year of study, 12 students (24.0%) were interns, 11 (22.0%) were in the second year, 10 (20.0%) were in the final year, 9 (18.0%) were first-year students, and 8 (16.0%) were in the third year. With respect to institution, 27 participants (54.0%) were from SN Superspeciality Hospital and 23 (46.0%) were from Jansewa Hospital. Most respondents, 21 (42.0%), resided in rural areas, followed by 16 (32.0%) from urban areas and 13 (26.0%) from semi-urban areas. Regarding marital status, 28 participants (56.0%) were single, while 22 (44.0%) were married.

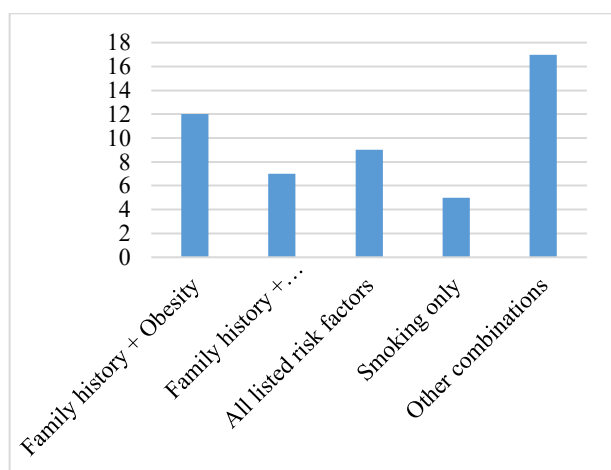
Additionally out of 50 participants, 24 (48%) reported a positive family history of breast cancer, while 14 (28%) reported no family history. Additionally, 12 (24%) participants stated that they did not know their family history status. Regarding the source of information about breast cancer, the most common source was Faculty/Class (26%), followed by Books/Articles (24%) and Social Media (20%). Television/Radio was reported by 8 (16%) participants, whereas 7 (14%) cited Friends/Relatives as their primary source. Concerning awareness, 23 (46%) participants reported that they had heard of breast cancer, while 27 (54%) had not heard about it. In terms of knowledge of breast cancer symptoms, the majority of participants, 37 (74%), reported that they were aware of the symptoms, whereas 13 (26%) indicated that they did not have knowledge of the symptoms.

### Knowledge of Breast Cancer Symptoms and Risk Factors

Out of 50 participants, multiple responses were recorded for knowledge of breast cancer symptoms. Ten participants reported lump in the breast and breast pain, while five reported lump in the breast, nipple discharge, and breast pain. Eight participants selected all five listed symptoms, and six reported lump in the breast along with nipple discharge. Four participants reported breast pain alone, whereas the remaining participants selected other combinations of symptoms (figure 1).



**Figure 1: Breast Cancer Symptoms reported by participants**



**Figure 2: Risk Factors of Breast Cancer reported by participants**

Similarly, for knowledge of risk factors, twelve participants reported family history and obesity, seven selected family history, smoking, and increasing age, and nine reported all listed risk factors. Five participants reported smoking only, while the others selected various combinations (figure 2).

### Knowledge and Perception Regarding Prevention and Early Detection

Further assessment of knowledge and perceptions regarding breast cancer revealed varied responses among participants. Regarding whether breast cancer is preventable, 19 participants (38%) responded “Yes,” while 15 (30%) stated “No,” and 16 (32%) reported that they did not know. When asked about the importance of

early detection, only 7 participants (14%) agreed that early detection is important, whereas 20 (40%) responded “No,” and 23 (46%) were not sure. Concerning awareness of Breast Self-Examination (BSE), 28 participants (56%) reported that they were aware of BSE, while 22 (44%) were not aware of it. However, knowledge regarding the correct method of performing BSE was lower, with only 19 participants (38%) stating that they knew how to perform BSE, while the majority, 31 (62%), reported that they did not know how to perform it. These findings indicate that although more than half of the participants had heard about BSE, practical knowledge regarding its correct performance and understanding of early detection remains limited.

The obtained results align with other recent studies among young female populations. In a large cross-sectional study of female students in Sri Lanka, high general awareness of breast cancer was found (98.7%), but detailed knowledge of screening methods such as BSE and mammography remained limited (Perera et al., 2025). Similarly, in a study among pharmacy students in Turkey, although participants reported reasonable recognition of risk factors and symptoms, overall awareness scores were moderate (Albayrak and Cengiz, 2024). A recent study reported that although more than 67% of women knew about BSE, only 60% practiced it regularly, and similar trends were observed for mammography uptake, indicating that knowledge alone may not be sufficient to prompt preventive actions (Gümüş and Küçükkaya, 2026).

### Perception and Attitude

The data pertaining to the perception and attitude of participants towards mammography revealed that all 50 participants (100%) reported that breast cancer is a serious health issue. Out of the 50 participants, 21 (42%) reported that they are afraid of BSE, while 18 participants (36%) agreed that they would undergo mammography willingly if required. A total of 16 female students (32%) agreed that discussing breast cancer is a taboo in society, whereas 38 participants (76%) agreed that health education sessions on breast cancer should be made mandatory. Additionally, 26 participants (52%) had already undergone a mammogram, while 24 participants (48%) had not undergone mammography due to fear (7; 14%), lack of awareness (4; 8%), cost issues (3; 6%), lack of time (8; 16%), and being too



young for the mammography test (2; 4%). Mammography remains a key tool for early detection of breast cancer, yet uptake is often suboptimal due to a combination of psychological, socio-cultural, and practical barriers (Abed et al., 2026; Wang, 2024).

The findings revealed that participants are aware of the risk of breast cancer but the lack of awareness and knowledge leads to the lower pre-assessment of these risks. Srinath et al. (2023) also reported the need of making women aware of the causes and risk factors of cancer through evidence-based strategies so that there is an increased adherence to screening.

## CONCLUSION

This study revealed that female students from selected institutions demonstrated moderate awareness but overall insufficient knowledge and suboptimal practices regarding breast cancer prevention and early detection. Although a considerable proportion of participants recognized common symptoms and were aware of BSE and mammography, many lacked comprehensive understanding of risk factors, preventability, and the importance of early detection. Knowledge regarding the correct method of performing BSE was particularly limited. Uncertainty about prevention and early detection was also notably high among participants. These findings highlight the urgent need for targeted, evidence-based educational interventions, especially for students from non-health science backgrounds and those residing in rural areas. Collaboration between healthcare professionals, educational institutions, and media platforms can play a significant role in strengthening awareness and promoting preventive practices among young women.

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