

COMPARATIVE EVALUATION OF AWARENESS AND PRACTICE OF BREAST SELF-EXAMINATION AMONG MEDICAL AND NON-MEDICAL FEMALE STUDENTS IN DIFFERENT UNIVERSITIES IN HAYATABAD, PESHAWAR

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Abstract

Background: Breast self-examination (BSE) is a simple breast-awareness practice that may encourage early recognition and reporting of breast changes. University students are an important group for breast-health education, but exposure to health information may differ between medical and non-medical disciplines. This study compared BSE awareness, knowledge, attitudes, confidence, training, and practice among female students from the two academic streams in Hayatabad, Peshawar.

Methods: A comparative cross-sectional survey was conducted over six months among 366 female undergraduates from Iqra National University and CECOS University. The sample included 183 medical and 183 non-medical students aged 18-30 years, recruited by convenience sampling. A structured self-administered questionnaire collected demographic and BSE-related information. Data were analyzed in SPSS version 22 using descriptive statistics and Pearson chi-square tests.

Results: Overall, 290 students (79.2%) had heard of BSE; 237 (64.8%) knew the correct age to begin, 223 (60.9%) knew the correct timing, and 221 (60.4%) reported knowing the correct technique. Most considered BSE important for early detection (83.6%), whereas 232 (63.4%) felt confident performing it. Only 187 (51.1%) had ever performed BSE and 181 (49.5%) had received formal training. Embarrassment (41.8%) and lack of knowledge (34.4%) were the leading barriers. Academic stream was associated with every assessed BSE variable ($p \leq 0.001$), with the direction of differences favoring medical students.

Conclusion: Awareness was relatively high, but practice and formal training were substantially lower. Medical students had stronger BSE-related outcomes than non-medical students. University programs should move beyond general awareness by providing practical demonstrations, confidence-building instruction, and targeted education for non-medical

INTRODUCTION

Breast cancer is a major women health concern, and delays in recognizing or reporting breast changes can limit opportunities for timely assessment. The burden is particularly important in settings where access to organized screening and diagnostic services is uneven. Research among university students has repeatedly shown that general awareness of breast cancer can coexist with limited knowledge of early-detection practices and inconsistent preventive behavior (Ahmad et al., 2024; Mohamed et al., 2022; Tomic et al., 2023). Breast self-examination is a self-check in which a woman observes and palpates her breasts for unusual changes, including a new lump, swelling, skin or nipple changes, discharge, or persistent pain. It is inexpensive and may help women become familiar with their usual breast appearance and feel. BSE does not replace clinical evaluation or diagnostic imaging; its practical value lies in breast awareness and prompt consultation when a change is noticed (Ibnawadh et al., 2021; Prachishree et al., 2024; Rehman et al., 2025; Sarker et al., 2022). Among young women, knowing that BSE exists does not necessarily lead to confident or regular performance. Studies from several university settings have identified gaps between awareness and practice, with lack of technical knowledge, fear of finding cancer, embarrassment, and low confidence frequently reported as barriers (Alshafie et al., 2024; Gamal et al., 2025; Mageed et al., 2023; Shukur et al., 2025; Tauho et al., 2025). In a study of college-going women in Delhi-NCR, for example, awareness of breast cancer and the possibility of early detection was much higher than the proportion who had ever performed BSE (Mukherjee Das et al., 2022). Academic background may shape this gap. Medical students encounter health promotion, disease prevention, anatomy, and clinical skills during their training, whereas non-medical students may have fewer opportunities for structured breast-health education. Comparative work has found better

BSE knowledge and skills among medical students, although practice remains incomplete even in medically trained groups (Thakur et al., 2025). This suggests that exposure to theory alone is not enough; practical instruction and confidence-building may also be needed. Direct comparative evidence from Peshawar is limited. The present study therefore aimed to compare BSE awareness and practice between medical and non-medical female students across two universities in Hayatabad, Peshawar. It also assessed knowledge of the correct age, timing, and technique; attitudes toward early detection; confidence; prior training; and perceived barriers to practice.

METHODS

Study design and setting

A comparative cross-sectional study was conducted over six months among female undergraduate students at Iqra National University and CECOS University in Peshawar, Pakistan.

Participants and sampling

The study included 366 students, divided equally between medical (n=183) and non-medical (n=183) streams. Eligible participants were female undergraduates aged 18-30 years who provided consent. Students who were unwilling to participate or who had a prior diagnosis of breast cancer were excluded. Participants were recruited using non-probability convenience sampling from classrooms and common university areas, including libraries, cafeterias, and auditoriums.

Data collection

Data were collected with a structured, self-administered questionnaire. The instrument recorded academic stream, age group, and year of study. BSE items covered prior awareness; knowledge of the correct age, timing, and technique; perceived importance for early detection; confidence in performing BSE; belief that regular BSE can help early diagnosis;

previous performance; reported frequency; receipt of formal training; and barriers to regular practice. Responses were kept confidential.

Statistical analysis

Data were entered and analyzed in SPSS version 22. Frequencies and percentages summarized participant characteristics and questionnaire responses. Pearson chi-square tests assessed associations between academic stream and each BSE-related variable.

Ethical considerations

Approval was obtained from the Institutional Review Board and the ethical committees of the

participating university Iqra National University and CECOS University in Peshawar, Pakistan. before data collection. Written informed consent was obtained from all participants, participation was voluntary, and responses were anonymized and stored confidentially.

RESULTS

Participant characteristics

The sample comprised 366 students, with equal representation from medical and non-medical streams. Most participants were 18-24 years old (62.8%), and 57.4% were in the first or second year of study (Table 1).

Table 1. Participant characteristics (N=366)

Characteristic	Category	n	%
Academic stream	Medical	183	50.0
	Non-medical	183	50.0
Age group	18-24 years	230	62.8
	25-30 years	136	37.2
Year of study	First or second year	210	57.4
	Third or fourth year	156	42.6

Awareness, knowledge, attitudes, practice, and training

Awareness was higher than practice. Nearly four in five participants had heard about BSE. About three in five reported knowing the correct timing and technique, while slightly fewer than two-thirds knew the correct age to begin. Positive

attitudes were common: 83.6% considered BSE important for early detection and 82.8% believed regular BSE could help diagnosis. Confidence was lower at 63.4%. Just over half had ever performed BSE, and fewer than half had received formal training (Table 2; Figure 1).

Table 2. Breast self-examination awareness, knowledge, attitudes, practice, and training (N=366)

Domain	Indicator	Yes, n (%)	No, n (%)
Awareness	Had heard about BSE	290 (79.2)	76 (20.8)
Knowledge	Knew the correct age to start	237 (64.8)	129 (35.2)
	Knew the correct timing	223 (60.9)	143 (39.1)
	Knew the correct technique	221 (60.4)	145 (39.6)
Attitude	Considered BSE important for early detection	306 (83.6)	60 (16.4)
Confidence	Felt confident performing BSE	232 (63.4)	134 (36.6)
Attitude	Believed regular BSE helps diagnosis	303 (82.8)	63 (17.2)
Practice	Had ever performed BSE	187 (51.1)	179 (48.9)
Training	Had received formal training	181 (49.5)	185 (50.5)

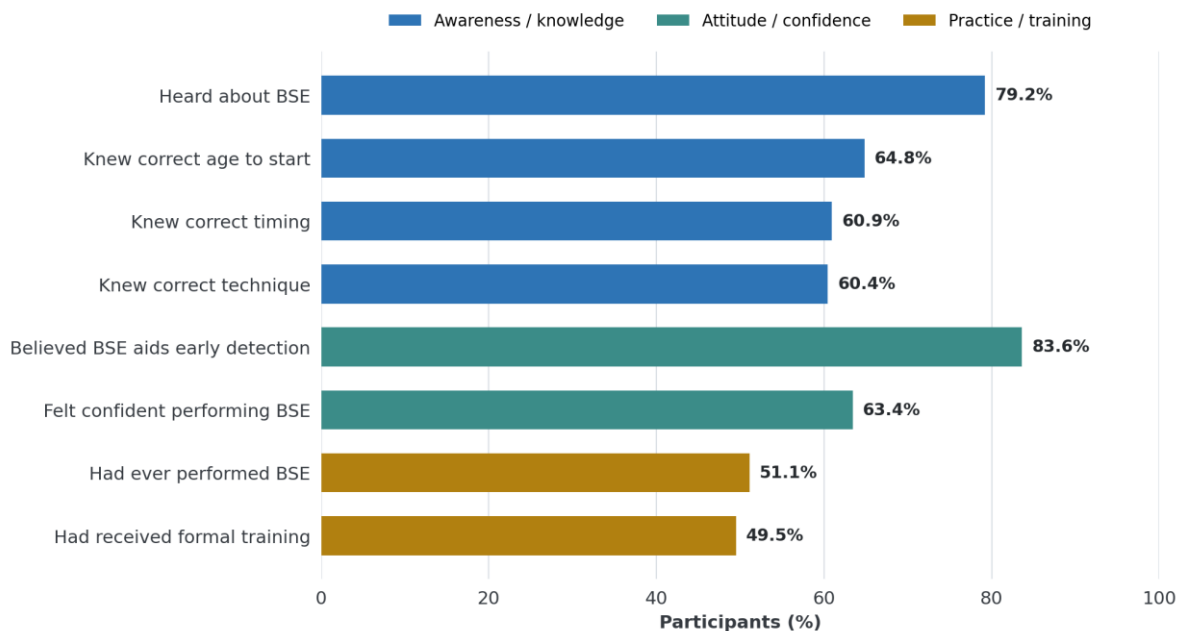


Figure 1. Selected BSE awareness, knowledge, confidence, practice, and training indicators among participants. Values are percentages of the full sample (N=366).

The practice-frequency output categorized 169 students (46.2%) as weekly/monthly and 197 (53.8%) as occasionally/rarely. Because the questionnaire presented frequency as a follow-up to prior BSE performance but the thesis table used the full sample as its denominator, these percentages are retained as reported and are not interpreted as the frequency distribution among

only the 187 students who had ever performed BSE.

Barriers to regular BSE

Embarrassment was the most frequently reported barrier (41.8%), followed by lack of knowledge (34.4%). Fear of detecting cancer was reported by 17.5%, while 6.3% selected another reason (Table 3).

Table 3. Reported barriers to regular breast self-examination (N=366)

Barrier	n	%
Embarrassment	153	41.8
Lack of knowledge	126	34.4
Fear of detecting cancer	64	17.5
Other	23	6.3

Association with academic stream

Academic stream was significantly associated with all measured BSE outcomes. The largest chi-square statistics were observed for frequency of BSE performance, ever having performed BSE, and knowledge of the correct technique. The

reported direction of the differences favored medical students in awareness, knowledge, confidence, training, and practice. For the one outcome with stream-specific counts available, 161 of 183 medical students (88.0%) had ever

performed BSE, compared with 26 of 183 non-medical students (14.2%).

Table 4. Association between academic stream and BSE-related variables (N=366)

Study variable	Chi-square	df	p-value
Had heard about BSE	41.515	1	<0.001
Knew the correct age to start	103.540	1	<0.001
Knew the correct timing	86.872	1	<0.001
Knew the correct technique	167.221	1	<0.001
Considered BSE important for early detection	42.182	1	<0.001
Felt confident performing BSE	91.170	1	<0.001
Believed regular BSE helps diagnosis	10.143	1	0.001
Had ever performed BSE	199.276	1	<0.001
Frequency of BSE performance	212.402	1	<0.001
Had received formal training	111.500	1	<0.001
Reported barriers to BSE	111.288	3	<0.001

DISCUSSION

This study found a clear separation between general awareness of BSE and its translation into practice. Most students had heard of BSE and viewed it positively, but only about half had ever performed it or received formal training. Knowledge of the correct age, timing, and technique was also notably lower than simple awareness. The pattern suggests that recognition of the term BSE is not the same as having the practical knowledge or confidence needed to act. The overall awareness level of 79.2% was almost identical to the 79.9% reported among female students at the University of Kerbala (Mageed et al., 2023). In both studies, positive views were more common than practice. Mageed et al. reported 91.0% agreement that BSE is important for early diagnosis but an overall practice proportion of 39.0%; in the present study, 83.6% considered BSE important and 51.1% had performed it at least once. Although the practice measures are not identical, both studies show that favorable attitudes alone do not ensure action. The present awareness estimate was higher than the 72.74% reported across female university students in Egypt, Jordan, and Syria by Gamal et al. (2025), but lower than the 89.6% observed among female medical students at Damascus University by Alshafie et al. (2024). The higher result in the Damascus study is

plausible in light of its exclusively medical sample. In the current study, inclusion of an equal number of non-medical students lowered the overall level and allowed the educational-stream gap to be examined directly. The proportion who had ever performed BSE was higher than the 29.8% reported among college-going women in Delhi-NCR (Mukherjee Das et al., 2022) and the 39.0% practice proportion reported by Mageed et al. (2023), but slightly lower than the 55.7% found among medical students by Alshafie et al. (2024). These comparisons should be read cautiously because studies used different populations and definitions of practice. The more stable conclusion across settings is the persistence of an awareness-practice gap. Academic stream was associated with every BSE variable examined in this study, and the direction consistently favored medical students. This agrees with the comparative findings of Thakur et al. (2025), who found higher knowledge and practical skill among medical students than among non-medical students, although outcomes in both groups remained less than optimal. Medical curricula provide repeated exposure to anatomy, disease prevention, screening, and clinical skills. Such exposure may improve both knowledge and the confidence to perform BSE. However, the present findings also indicate that educational exposure does not

guarantee universal practice. The barrier profile helps explain why. Embarrassment was more common than fear of detecting cancer and was followed closely by lack of knowledge. Similar work has identified insufficient technical knowledge, fear, and low confidence as reasons why students do not practice BSE consistently (Alshafie et al., 2024; Sarker et al., 2022; Tauho et al., 2025). These barriers are practical and emotional, not simply informational. A lecture may increase awareness but may do little to reduce embarrassment or build confidence in the technique. The findings therefore support a shift from awareness-only messages to skills-based breast-health education. Universities could offer brief, private, culturally sensitive sessions that explain the purpose and limitations of BSE, demonstrate the technique with appropriate teaching models, provide opportunities for questions, and reinforce when professional assessment is needed. Non-medical students should be prioritized because they have less routine access to health education. Medical students should also receive refresher opportunities, since awareness within that group does not necessarily translate into consistent behavior. Institutional support may strengthen these efforts. Structured, theory-based education has been shown to improve both BSE practice and self-efficacy (Mahar et al., 2026). Regular workshops, student health campaigns, and integration of breast-health instruction into general university wellness activities may help turn knowledge into sustained practice. The emphasis should remain on informed breast awareness and timely consultation rather than presenting BSE as a substitute for clinical assessment or imaging.

LIMITATIONS

Several limitations should be considered. Convenience sampling from two private universities limits generalizability to other students in Peshawar. The cross-sectional design cannot establish that academic stream caused the observed differences. Practice and confidence were self-reported and may be affected by recall or

social-desirability bias. The study did not examine socioeconomic status, family history, cultural influences, or information sources in detail. It recorded whether formal training had been received but not its duration or quality, and it excluded women outside the 18-30-year age range. Finally, the practice-frequency item was presented as conditional but tabulated across the full sample, limiting interpretation of that descriptive result.

CONCLUSION

Female university students in Hayatabad showed relatively high awareness of BSE but lower practical knowledge, confidence, training, and experience. Medical students consistently performed better than non-medical students across the assessed outcomes, yet the overall findings still point to a substantial knowledge-practice gap. University breast-health programs should combine clear information with practical demonstration, confidence-building, and culturally sensitive support, with particular attention to non-medical students.

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