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AWARENESS AND PRACTICES OF BREAST SELF-EXAMINATION AMONG FEMALE HEALTH SCIENCE STUDENTS IN DISTRICT BANNU

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Abstract

Background: *Breast cancer is a leading cause of morbidity and mortality among women worldwide, with early detection being critical to improving survival outcomes, particularly in low-resource settings. Breast self-examination (BSE) is a low-cost, accessible screening method applicable even where advanced diagnostics are unavailable.*

Objectives: *To assess BSE awareness levels, evaluate existing BSE practices, and determine the relationship between awareness and practice among female health science students in District Bannu.*

Methods: *A quantitative cross-sectional study was conducted among female health science students (N = 198) affiliated with Khyber Medical University, Peshawar. Data were collected via a structured self-administered questionnaire using stratified random sampling. Descriptive statistics, Pearson correlation, Chi-square tests, and independent samples t-tests were used for analysis.*

Results: *BSE awareness was high (84.2%), but only 58.2% had ever performed BSE. Monthly BSE practice was reported by 41.8%, while 37.5% had never practiced BSE. A statistically significant positive correlation was found between awareness and practice ($r = .29$, $p < .001$). Chi-square analysis confirmed that high-awareness students practiced BSE significantly more than low-awareness students (67.5% vs. 34.6%; $\chi^2 = 12.41$, $p = .002$). Married students showed higher practice scores than single students ($t = -2.32$, $p = .021$).*

Conclusion: *A significant knowledge-practice gap exists in this population. Awareness alone is insufficient to ensure regular BSE practice. Skill-based training, behavioral reinforcement, and culturally sensitive educational interventions should be embedded in health science curricula.*

INTRODUCTION

Breast cancer is among one of the greatest health issues in the world, as it is one of the 12 percent of all new cancer-related diagnoses and one among 7 percent of all cancer-related deaths across the world. In 2020, there were also estimated 2.3 million new cases around the world. The mortality rate is still excessively high in low- and middle-income countries, where the high lack of access to diagnostic facilities makes it harder to detect and treat the disease (Kim et al., 2025; GLOBOCAN, 2021).

Breast cancer is the commonest malignancy in women in Pakistan with limited awareness and lack of access to screening services worsening the situation. Inexpensive and technologically advanced screening modalities such as mammography and ultrasound are generally unavailable in any low-resource setting, such as District Bannu. Breast self-examination (BSE) therefore happens to be an essential, non-invasive, cost-free first line detection tool that enables women to observe any change in breast tissue and seek early assistance.

Potential BSE promoters Female health science students pose an exceptionally strategic group to promote BSE. Being future healthcare providers and community educators, they have a direct impact on the patient outcomes and community health norms since their personal health behaviors and clinical knowledge affect the outcomes and health norms of the community. Nevertheless, research in related settings continuously shows that there are considerable differences between knowledge and practice, with understanding of BSE failing to result in consistent practice (Ahmed et al., 2018; Budden et al., 2020).

The objective of the present study was to evaluate the BSE awareness and practice level of female health science students in the District of Bannu as well as to determine the gap in knowledge practice and how the awareness and behavioural uptake are correlated. Locally produced evidence is necessary in designing region specific educational interventions that can be in line with cultural and socio-economic realities of the region.

1.1 Objectives

1. To assess the level of breast cancer and BSE awareness among female health science students.
2. To evaluate existing BSE practices among female health science students.
3. To determine the relationship between awareness levels and BSE practices.

2. LITERATURE REVIEW

The world-based knowledge of breast cancer awareness and BSE practice is always accompanied by knowledge-practice gap, where women, even educated and health profession students, know about BSE without engaging in it on a regular basis. A cross-sectional survey conducted on working women in Kuwait revealed that the level of awareness regarding breast cancer detection was higher with higher education levels, but overall awareness was moderate, which implies that formal education alone without specific health education programs is not effective (Al-Mutawah et al., 2025).

There was moderate to high knowledge and attitude scores among the female college students in Karachi, with poor BSE practice (Ahmed et al., 2018). The reasons behind low practice were fear of discovering a lump, cultural taboos and practice unrelated to practical training-similarities that are very pertinent to the study setting in Bannu. Likewise, in a study conducted at Babcock University, Nigeria, the good awareness and knowledge of symptoms were 78.12 percent and 96.9 percent, respectively, but the proportion of BSE practices was low, proving that knowledge and positive attitude are not enough predictor variables to change behaviors (Maitanmi et al., 2023).

A study conducted in Ahvaz Province, Iran, revealed that young female scholars showed low levels of BSE knowledge, negative attitudes, and low practice levels, which shows their susceptibility to this age group (Najafi et al., 2024). A survey of 718 high school students in Turkey found that there are significant relationships among the practices of BSE and age, academic grade level, and knowledge that indicate that education progression and systematic health training enhances preventive behaviors gradually (Karayurt et al., 2008).

The socio-cultural obstacles are generally reported to hinder the uptake of BSE, including embarrassment, cancer fatalism, misconceptions, and access to healthcare, especially among conservative communities (Hlormenu et al., 2024; Rashidi et al., 2022). Digital and mass media campaigns can prove extremely effective in creating awareness (85 percent of studies have shown it), yet practical skill acquisition is needed to change behavior in addition to informational exposure. Literature, therefore, justifies the necessity of a structured, skills-based BSE training engrained in the health science programs, especially in underserved areas such as Bannu District (Amegbedzi et al., 2022).

3. MATERIALS AND METHODS

3.1 Study Design and Setting

The design used was a cross-sectional quantitative design. The research was carried out in health science colleges and institutes based in District Bannu of Khyber Medical University (KMU), Peshawar, between the months of October and December 2025.

3.2 Participants

All female students enrolled in the institutions of health sciences in the chosen institutions (N = 396) formed the target population. The sample of 198 participants (50% sampling fraction) was achieved through stratified random sampling by dividing by proportion among the institutions. Inclusion criteria were enrolled in a KMU-affiliated health sciences program and the issuance of informed consent. Those not willing to participate were

excluded and those who did not fill their forms were not counted.

3.3 Research Instrument

On the premise of the available literature and objectives of the study, a structured, self-administered questionnaire was designed. It contained four questions: (A) socio-demographic data; (B) BSE awareness and knowledge (when recommended, how often, early warning signs, the benefits of early detection); (C) BSE practice (when it is recommended, how often, what method is used, what barriers) and (D) attitude to BSE (a 5-point Likert scale). The questionnaire was sent via email and WhatsApp and the estimated duration to complete the questionnaire was 10-15 minutes.

3.4 Statistical Analysis

The SPSS and R were used to analyze the data, and all variables were calculated on descriptive statistics (frequencies, percentages, means, standard deviations). Alpha was used to measure internal consistency. The Shapiro-Wilk test was used to test distributional normality of composite scores. The correlation by Pearson, was done to investigate the correlation between composite awareness and practice scores. Chi-square tests were used to determine the association of the awareness category (low vs. high) with BSE practice (yes vs. no) and vice versa. Independent sample t -tests were used to compare marital status scores of BSE practice. The level of statistical significance was established to be $p < .05$.

3.5 Ethical Considerations

The concerned institutional authority approved the ethicality of the study. All the participants gave their informed consent in writing before the data collection. Anonymity and confidentiality of the responses were ensured at all times. Participation was completely voluntary whereby a person could withdraw any time without any ramifications.

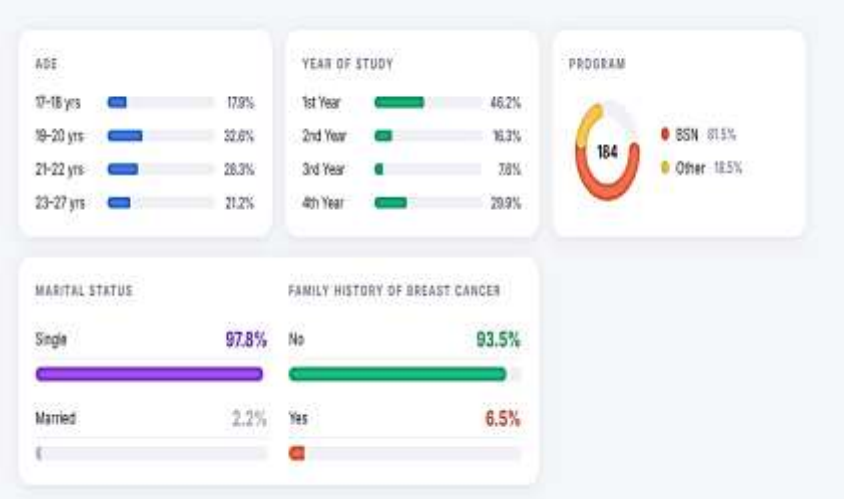
4. RESULTS

4.1 Demographic Characteristics

Out of the 198 participants who were enrolled, 184 of them returned full demographics information (Table 1). Most of them were at the age of 19-20 years (32.6%), 21-22 years (28.3%). Only a small percentage (81.5) were enrolled in the program of BSN and almost half of them were first year students (46.2). The sample consisted mainly of single individuals (97.8%), and a majority of them did not have any family history of breast cancer (93.5%).

Table 1. Demographic Characteristics of Respondents (N = 184)

Age	17–18 years	33	17.9%
	19–20 years	60	32.6%
	21–22 years	52	28.3%
	23–27 years	39	21.2%
Program	BSN	150	81.5%
	Other	34	18.5%
Year of Study	1st Year	85	46.2%
	2nd Year	30	16.3%
	3rd Year	14	7.6%
	4th Year	55	29.9%
Marital Status	Single	180	97.8%
	Married	4	2.2%
Family History of BC	Yes	12	6.5%
	No	172	93.5%



4.2 BSE Awareness and Practice

Most of the respondents (84.2) said they had heard about BSE, and only 58.2% had ever done it. Others who reported frequency indicated that 41.8% practiced BSE monthly, 14.1% rarely, 6.5% occasionally and 37.5% never practiced BSE (Table 2). This trend reflects a high knowledge-practice divide in this group.

Table 2. BSE Awareness and Practice Among Respondents (N = 184)

Heard about BSE	Yes	155	84.2%
	No	29	15.8%
Ever Performed BSE	Yes	107	58.2%
	No	77	41.8%
Frequency of BSE	Every Month	77	41.8%
	Occasionally	12	6.5%
	Rarely	26	14.1%
	Never	69	37.5%

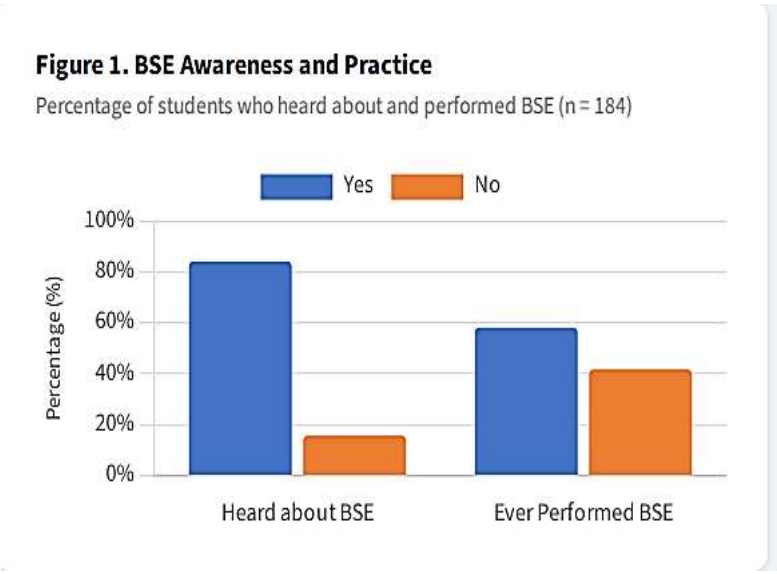
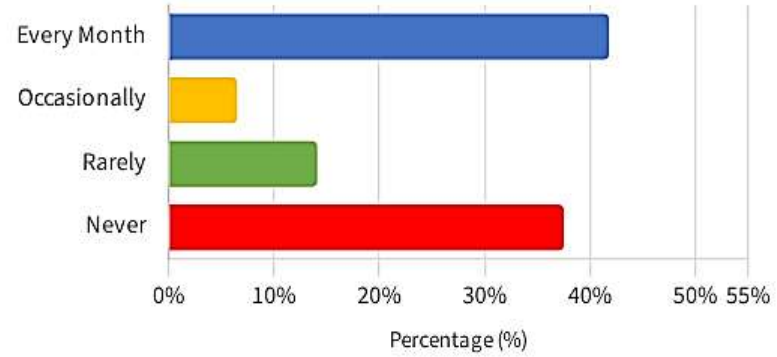


Figure 2. Frequency of BSE Performance

How often students perform BSE (n = 184)



4.3 Descriptive Statistics and Normality

The composite scores were calculated Awareness Total (Mean = 13.48, SD = 1.49; range: 1121) and Practice Total (Mean = 10.15, SD = 2.66; range: 815). The awareness scores were found to be low in variability (ceiling effect) whereas the practice scores were more widely distributed which reveals that BSE behavior is heterogeneous. Shapiro-Wilk tests also indicated that neither distribution was normal (Awareness: W = 0.424, p =.001; Practice: W = 0.734, p =.001), and that avoidable careful interpretation of parametric results was necessary.

3. Descriptive Statistics and Normality Test Results (N = 184)

Awareness_Total	13.48	1.49	11	21	0.424	< .001
Practice_Total	10.15	2.66	8	15	0.734	< .001

4.4 Reliability Analysis

The Awareness Practice Attitude scale gave low alpha (a =.36 in 16 items), implying that the three measures are separate dimensions, and they cannot be condensed into a composite score. There is a direct methodological implication of this finding regarding future studies, revision of instruments.

4.5 Correlation Between Awareness and Practice

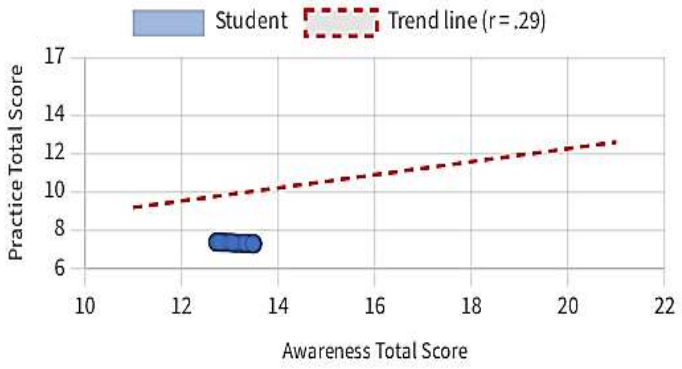
The positive relationship between Awareness Total and Practice Total was found to be statistically significant (r =.29, p <.001), i.e., the more aware students were, the higher the scores they gave on BSE practice questions. The small-to-moderate strength of the effect (r =.29) however indicates that awareness is a minor contributor to the variance in practice behavior and other variables such as confidence, cultural comfort, fear and practical training are also significant determinants.

Table 4. Pearson Correlation Between Awareness and Practice (N = 184)

Awareness_Total × Practice_Total	.29	< .001	Positive, statistically significant

Figure 4. Scatter Plot: Awareness × Practice Scores

Pearson r = .29, p < .001 — positive significant correlation



4.6 Chi-Square Test: Awareness Level and BSE Practice

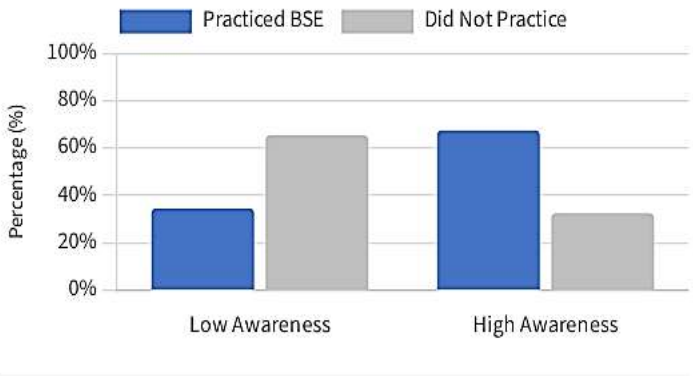
There was a Chi-square test of Association with awareness divided into the low (n = 81) and high (n = 117) and BSE practice dichotomized into yes or no. Among low-awareness participants, BSE was practiced by only 34.6% of the respondents, as opposed to 67.5% of the high-awareness respondents- almost a two-fold difference. The level of this association was statistically significant (kh2 = 12.41, df = 1, p =.002) which resulted in rejecting the null hypothesis that the awareness level and BSE practice are independent.

Table 5. Association Between Awareness Level and BSE Practice — Chi-Square Test (N = 198)

Low Awareness	28 (34.6%)	53 (65.4%)	81
High Awareness	79 (67.5%)	38 (32.5%)	117
Total	107	91	198

Figure 5. BSE Practice by Awareness Level

Practiced vs. did not practice BSE by awareness group (n = 198)



Chi-Square result: $\chi^2 = 12.41$, df = 1, p = .002

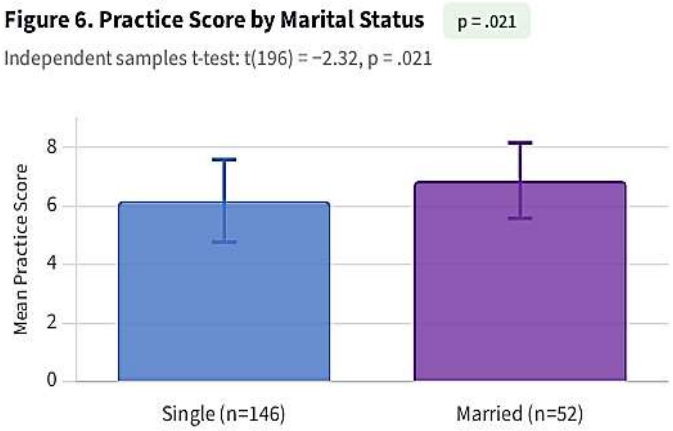
4.7 Independent Samples t-Test: BSE Practice by Marital Status

Independent samples t-test were used to compare the mean BSE practice scores using marital status. The married participants (Mean = 6.87, SD = 1.29, n = 52) were found to score significantly higher than single participants (Mean = 6.18, SD = 1.41, n = 146), with the test of Levene showing no difference in variances (p =.213). The t-test value was statistically significant (t = [?]2.32, df = 196, p =.021). This observation indicates that marital

status can be linked to increased health awareness or the increased contact with healthcare facilities. Note: there was an inconsistency noted between the demographic table (only 4 married participants, 2.2 percent), and the t-test group sizes; this needs to be confirmed in the final dataset and is admitted to be one of the limitations of the study.

Table 6. Independent Samples t-Test: BSE Practice Score by Marital Status

Single	146	6.18	1.41	−2.32	.021
Married	52	6.87	1.29		



5. DISCUSSION

The results of the present research show that although BSE awareness is also high in the group of female health science students in Bannu District, its regular practice is still less than optimal, as it is observed in the world and region literature. This gap in knowledge that is revealed here (84.2% awareness and 58.2% practice; 37.5% never practitioners) is similar to the results of comparable populations in Pakistan, Nigeria, Ghana, and Iran (Ahmed et al., 2018; Maitanmi et al., 2023; Amegbedzi et al., 2022; Najafi et al., 2024).

The significant but insignificant correlation between awareness and practice (r =.29) confirms the lack of knowledge-based interventions that are documented widely. On the one hand, behavior change requires awareness, which is only a prerequisite. A number of obstacles such as fear of having a lump, embarrassment, cultural stigma, lack of knowledge about proper technique, and low perceived risk to themselves (as the family history of breast cancer in such a sample is low at 6.5%), probably moderate the knowledge to practice translation. They are firmly entrenched obstacles in the world BSE literature (Hlormenu et al., 2024; Karayurt et al., 2008).

The frequency polarization of BSE with nearly equal percentages of reporting monthly practice(41.8%) and never (37.5%) indicates that a motivated subset of the population has now adopted BSE as a habit of practice, and a considerable percentage of the population is still disengaged. Such bifurcation leads to the emphasis on the strategies of habit formation such as demonstrations repeatedly, reinforcement among peers, and scheduled reminders instead of informational campaigns that are not repeated.

The significant low internal consistency of the combined scale (a =.36) has been an essential methodological result. Awareness, practice and attitude are unique psychological constructs that have various antecedents, and mixing them into one scale compromises the measurement validity of these constructs. Subsequent studies must consider them as two different subscales whose reliability should be evaluated independently, and their factor validation done.

The increased scores of BSE practice between married and single students and the need to verify the scores because of sample size differences may represent a higher level of health-seeking behavior because of life-stage influences like contact with maternal health services. This is something that

should be explored in future research using larger samples of married students.

6.CONCLUSION AND RECOMMENDATIONS

This paper shows that female health science students in District Bannu are fully aware of BSE, but there is no significant change in practice, indicating that there is still a knowledge-practice gap. The statistically significant correlation between the awareness and practice supports the idea that the raising of the awareness, in its turn, is likely to enhance the BSE uptake but the awareness is not the guarantee that the behavioral pattern will be adhered to. The correlation analysis and the Chi-square outcomes point out that this gap needs to be filled by means of multidimensional interventions.

6.1 Recommendations

1. Embed structured, skills-based BSE training in health science curricula using simulation models and practical demonstrations.
2. Implement semester-wise BSE refresher sessions in women's health, community health, and preventive medicine modules.
3. Establish peer-based BSE education programs using trained senior students as campus health advocates.
4. Develop culturally sensitive educational materials that address fear, stigma, and myths specific to the Bannu cultural context.
5. Utilize digital platforms (WhatsApp, SMS reminders) to prompt monthly BSE practice and share instructional content.
6. Redesign the BSE measurement instrument with separate, validated subscales for awareness, attitude, and practice in future research.

6.2 Study Limitations

Such a cross-sectional design does not allow one to make a causal inference. Self-reported data is also prone to social desirability bias. The methodology of data collection used online data collection is efficiency, but it might have caused participation bias. The difference in the number of N between analyses (N = 184 vs. N = 198) indicate that there were some missing data which cannot be overlooked in any subsequent analysis. Cronbach alpha of the composite scale is low, which reduces the reliability of composite scoring.

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