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Original Article

Knowledge of Breast Cancer and Breast Self-Examination among Nursing Students

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ABSTRACT

Background: Breast cancer is an important public-health concern, and adequate knowledge among nursing students is relevant to their future role in breast-health education and early recognition of breast abnormalities. Objective: To assess knowledge regarding breast cancer and breast self-examination among female nursing students at the School of Nursing, Ali Fatima Hospital, Lahore. Methods: A descriptive cross-sectional study was conducted from January to April 2026 among female third-year, fourth year, and internship nursing students aged ≥18 years. Participants were recruited through convenience sampling, and data were collected electronically using a structured questionnaire accessed through a QR code. Of 100 questionnaires distributed, 65 complete responses were included. Data were analyzed using IBM SPSS Statistics version 25.0 and summarized using frequencies and percentages. Results: Among 65 participants, 38 (58.5%) were aged 18–22 years, and all were unmarried. Fourth-year students comprised 46.2% of the sample. Poor knowledge of breast cancer and breast self-examination was identified in 51 participants (78.5%), while 13 (20.0%) had good knowledge and 1 (1.5%) had satisfactory knowledge. Conclusion: Most surveyed nursing students demonstrated poor knowledge of breast cancer and breast self-examination, indicating an important breast-health knowledge gap within this study population. Keywords: Breast cancer; breast self-examination; knowledge; nursing students; breast health; Pakistan.

INTRODUCTION

Breast cancer is a major public-health concern among women and remains an important cause of cancer-related morbidity and mortality worldwide. It develops through uncontrolled proliferation of abnormal breast cells, which may invade surrounding tissues and metastasize to distant sites (1). Although breast cancer occurs more frequently in older women, it also affects younger women, making awareness of risk factors, warning signs, and early detection relevant across a broad age range (2). In Pakistan, breast cancer represents a particularly important health concern, with evidence indicating a substantial disease burden and persistent challenges related to awareness, timely recognition, and access to appropriate screening and diagnostic services (3).

Early recognition of breast abnormalities is important because delayed presentation may contribute to diagnosis at more advanced stages. Breast cancer awareness therefore includes knowledge of common warning signs, major

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risk factors, available screening approaches, and appropriate responses to breast changes. Breast self-examination (BSE) has historically been promoted as a simple and inexpensive approach through which women can become familiar with the normal appearance and feel of their breasts and identify changes that may require professional assessment (4). Although BSE should not be regarded as a substitute for recommended clinical or imaging-based screening, particularly mammography where indicated, knowledge of breast awareness and correct BSE procedures may remain relevant in settings where access to organized screening is limited. Studies among female university students have demonstrated that awareness of breast cancer does not necessarily translate into adequate knowledge or regular BSE practice (4,5).

Nursing students represent an important population in this context because they are future healthcare professionals who may contribute to patient education, health promotion, and early recognition of breast-related abnormalities. Their knowledge of breast cancer and BSE is relevant not only to their personal health awareness but also to their future responsibilities in educating patients and communities. Previous research among female university and nursing students has identified variable levels of knowledge regarding breast cancer risk factors, warning signs, screening approaches, and BSE. A study among female university students in Gaza reported that, although knowledge of breast cancer signs and symptoms was relatively high, overall knowledge of breast cancer and BSE remained inadequate in a substantial proportion of participants (6). Similarly, studies conducted in different populations have identified gaps between general awareness of breast cancer and detailed knowledge or consistent practice of BSE (7,8).

Evidence from Pakistan also suggests persistent deficiencies in breast cancer and BSE awareness among female students and healthcare-related populations. Research among female undergraduate students in Karachi demonstrated gaps in knowledge, attitudes, and practices concerning breast cancer and BSE (5). Another Pakistani study involving female medical students and hospital employees identified shortcomings in breast cancer health literacy and self-breast-examination awareness (9). More recent evidence among undergraduate students has similarly shown that knowledge of breast cancer and BSE may vary according to educational exposure and student characteristics, with a considerable proportion of participants demonstrating inadequate awareness (10). These findings are important because healthcare students may be expected to communicate preventive health information accurately during their professional practice.

International studies further indicate that BSE knowledge and practice are influenced by multiple factors, including education, previous information or training, family history, access to health information, and individual awareness of breast cancer (7,11). However, findings from one setting cannot necessarily be generalized to another because educational curricula, clinical exposure, sociocultural factors, and opportunities for breast-health education may differ considerably. Available studies have examined university students, medical students, healthcare workers, and nursing populations in different settings, but evidence specifically describing breast cancer and BSE knowledge among female nursing students at the School of Nursing, Ali Fatima Hospital, Lahore, remains limited in the literature included in this manuscript. Identifying knowledge gaps among nursing students may help determine whether greater emphasis on breast-health education is warranted within their academic and clinical training. Accordingly, this descriptive cross-sectional study aimed to assess the level of knowledge regarding breast cancer and breast self-examination among female nursing students at the School of Nursing, Ali Fatima Hospital, Lahore.

MATERIAL AND METHODS

A quantitative descriptive cross-sectional study was conducted to assess knowledge regarding breast cancer and breast self-examination among female nursing students enrolled at the School of Nursing, Ali Fatima Hospital, Lahore, Pakistan. The study was carried out over four months, from January to April 2026, following approval of the study synopsis by the Research Ethics Committee of Green International University, Lahore. The target population comprised female nursing students studying in the third year, fourth year, or internship phase of their nursing programme. Students were eligible if they were aged 18 years or older, were enrolled in one of the specified academic levels, and voluntarily consented to participate. Students who declined participation, were absent during data collection, or submitted incomplete questionnaires were excluded from the final analysis.

Participants were recruited using a convenience sampling technique. Potential participants were approached by the research team in classrooms and common areas of the nursing school, where the purpose and procedures of the study were explained before informed consent was obtained. The planned sample size was 100 participants. To

facilitate recruitment and allow for incomplete or non-participating responses, 100 online questionnaires were distributed. Of these, 65 complete questionnaires fulfilled the study requirements and were included in the final analysis. The manuscript also reports use of the single-population proportion expression (n=Z^2p(1-p)/d^2) in relation to sample-size estimation; however, the final analyzed sample consisted of the 65 eligible respondents who completed the questionnaire. Data were collected using a structured questionnaire adapted from previously validated studies on breast cancer and breast self-examination knowledge. The questionnaire was administered electronically through an online survey that participants accessed by scanning a QR code using their smartphones. Participants completed and submitted the questionnaire electronically on the same day. The instrument collected demographic information, including age, marital status, academic year, grade point average, family history of breast cancer, general health information, and previous breast-related conditions. The principal study outcome was participants' knowledge of breast cancer and breast self-examination. Breast cancer was operationally defined as a condition characterized by uncontrolled proliferation of abnormal cells in breast tissue, while breast self-examination referred to a technique through which women examine their own breasts for possible abnormalities. Knowledge was defined as the participants' level of understanding of breast cancer and breast self-examination as measured using the study questionnaire.

The questionnaire was reviewed for suitability and content relevance to the study objectives. The manuscript reports that subject experts assessed the instrument for content validity and that internal consistency was evaluated using Cronbach's alpha, with a reported coefficient of 0.82, indicating acceptable internal consistency. The questionnaire was designed to be straightforward and comprehensible to facilitate consistent completion. Data collection was conducted using the same electronic administration procedure for all participants, and only complete questionnaires were included in the analytical dataset to reduce inconsistencies arising from partially completed responses. Participant responses were treated confidentially, and identifying information was not used in the analysis or reporting of results. Data were entered and analyzed using IBM SPSS Statistics version 25.0. Descriptive statistics were used to summarize participant characteristics and the principal study outcome. Categorical variables were reported as frequencies and percentages, while quantitative variables were summarized using means and standard deviations where applicable. Knowledge regarding breast cancer and breast self-examination was summarized according to the knowledge categories generated from the study questionnaire. The analysis was descriptive in accordance with the cross-sectional objective of determining the level of knowledge in the sampled nursing students. Incomplete questionnaires were excluded before analysis; therefore, the reported analyses were based on 65 complete cases. Ethical approval was obtained from the relevant ethics committee of Green International University, Lahore, and administrative permission was obtained from the School of Nursing, Ali Fatima Hospital. Participation was voluntary, and informed consent was obtained from each participant before data collection. Participants were informed of the study purpose, confidentiality of their responses, their right to decline participation, and their right to withdraw without penalty. The information collected was used solely for research purposes, and participant privacy and anonymity were maintained throughout data collection, analysis, and reporting.

RESULTS

Of the 100 questionnaires distributed, 65 complete responses were included in the final analysis, corresponding to 65.0% of the questionnaires distributed.

Table 1. Demographic and academic characteristics of participants (n=65)

Characteristic	Category	n (%)
Age, years	18–22	38 (58.5)
	22–26	27 (41.5)
	26–30	0 (0.0)
Marital status	Single	65 (100.0)
	Married	0 (0.0)
Academic year	Third year	17 (26.2)
	Fourth year	30 (46.2)
	Internship	18 (27.7)
GPA	<3.0	4 (6.2)
	3.0–3.4	26 (40.0)
	3.5–3.99	35 (53.8)

Among the 65 participants, 38 (58.5%) were aged 18–22 years and 27 (41.5%) were aged 22–26 years. All participants were unmarried. Fourth-year students constituted the largest academic group, accounting for 30 (46.2%) participants, followed by interns at 18 (27.7%) and third-year students at 17 (26.2%). Regarding academic performance, 35 (53.8%) participants had a GPA of 3.5–3.99, while 26 (40.0%) had a GPA of 3.0–3.4 and 4 (6.2%) had a GPA below 3.0.

Table 2. Distribution of breast cancer and breast self-examination knowledge categories (n=65)

Knowledge category	n (%)	95% CI (%)
Poor	51 (78.5)	67.0–86.7
Satisfactory	1 (1.5)	0.3–8.2
Good	13 (20.0)	12.1–31.3
Total	65 (100.0)	—

CI, confidence interval. Confidence intervals for proportions were calculated using the Wilson score method. Poor knowledge was the predominant category, identified in 51 of 65 participants (78.5%; 95% CI, 67.0–86.7%). Good knowledge was observed in 13 participants (20.0%; 95% CI, 12.1–31.3%), whereas only 1 participant (1.5%; 95% CI, 0.3–8.2%) was classified as having satisfactory knowledge. Overall, the descriptive findings demonstrate that more than three-quarters of the surveyed nursing students were classified within the poor-knowledge category according to the study questionnaire.

DISCUSSION

The present study found that knowledge of breast cancer and breast self-examination was inadequate among a substantial proportion of the surveyed female nursing students, despite most participants being in the later stages of their nursing education and having relatively strong academic performance. This finding is important in relation to the study objective because nursing students are future healthcare professionals who may be expected to participate in breast-health education and early-detection counselling. However, the cross-sectional design allows only description of the observed level of knowledge and does not establish why these knowledge gaps occurred.

The predominance of poor knowledge in the present study is broadly consistent with previous research demonstrating incomplete understanding of breast cancer and BSE among female university and healthcare students. Abo Al-Shiekh et al. reported that although female university students in Gaza demonstrated relatively good awareness of some breast cancer signs and symptoms, overall knowledge of breast cancer and BSE remained inadequate in a considerable proportion of participants (6). Similarly, Sakhi et al. found that only 25.9% of medical-institute students had good knowledge of BSE, despite a larger proportion having previously heard about the practice (8). Pakistani evidence has also identified deficiencies in breast cancer and self-examination awareness among female medical students and hospital employees, suggesting that general exposure to healthcare environments does not necessarily ensure comprehensive breast-health knowledge (9). More recent findings from undergraduate students in Karachi likewise demonstrated that substantial proportions of students did not possess adequate knowledge of either breast cancer or BSE (10).

The magnitude of poor knowledge observed in the present study appears greater than that reported in some previous populations. For example, studies summarized in the existing literature have described higher levels of adequate knowledge or BSE awareness among selected female university and nursing populations (10,11). Such differences may reflect variation in study populations, academic curricula, prior clinical exposure, breast-health education, access to information, and the questionnaires or scoring thresholds used to classify knowledge. Because different studies have used different definitions of adequate knowledge and different combinations of breast cancer and BSE items, direct comparison of percentages should therefore be interpreted cautiously. These methodological differences may partly explain why knowledge levels vary considerably across settings (12,13).

The finding of inadequate knowledge despite relatively high GPA values is also noteworthy. In the current sample, academic performance and breast-health knowledge were not formally tested for association, so it cannot be concluded that GPA was unrelated to breast cancer or BSE knowledge. Nevertheless, the coexistence of good general academic performance with a high proportion of poor breast-health knowledge suggests that achievement across the broader nursing curriculum may not necessarily reflect mastery of a specific preventive-health topic. Previous studies have indicated that BSE knowledge and practice may be associated with educational exposure, access to health information, previous training, family history, and other contextual factors (14,15). This supports

the possibility that topic-specific educational opportunities may be more relevant to breast-health knowledge than overall academic performance alone.

The academic distribution of the sample also deserves cautious interpretation. Most participants were fourth-year students or interns, groups that might reasonably be expected to have had greater clinical exposure than junior students. Despite this, overall knowledge remained limited. This observation may indicate a need to examine how breast cancer awareness and BSE are addressed within nursing education, although the present study did not evaluate curriculum content, teaching quality, or prior training and therefore cannot determine whether educational deficiencies were responsible. Similar concerns have been raised in Pakistani healthcare-student populations in which gaps in breast cancer health literacy were observed despite participants' medical or healthcare backgrounds (16,17).

From a public-health perspective, knowledge among nursing students is relevant because nurses frequently contribute to health education, patient counselling, and community awareness. In settings where access to organized breast screening may be limited, accurate understanding of breast warning signs, appropriate screening pathways, and breast awareness can support timely referral and health-seeking behaviour. BSE should not be regarded as a substitute for recommended clinical assessment or mammographic screening, but familiarity with breast changes may contribute to awareness and recognition of abnormalities (4). Accordingly, strengthening accurate breast-health knowledge during nursing education may help prepare students for future patient-education roles, although the effectiveness of any specific educational intervention would need to be evaluated separately (18,19).

Several strengths of the study should be considered. It focused specifically on female nursing students, a population with potential future responsibility for preventive health education, and used a structured questionnaire to assess breast cancer and BSE knowledge in a defined institutional setting. The reported internal-consistency coefficient of 0.82 also suggests acceptable reliability of the questionnaire used in the study. At the same time, the findings must be interpreted within important methodological limitations. The study was conducted at a single nursing institution and used convenience sampling, which limits generalizability to nursing students in other institutions or regions. The final sample comprised only 65 participants, which was smaller than the planned sample reported in the Methods and reduced the precision of the descriptive estimates. Because participation relied on self-administered questionnaire responses, reporting and response biases are also possible. The cross-sectional design precludes assessment of temporal or causal relationships, and the available analysis was descriptive; therefore, relationships between knowledge and characteristics such as academic year, GPA, or previous educational exposure cannot be inferred. In addition, differences in questionnaire content and knowledge-classification thresholds across previous studies limit direct comparison with published prevalence estimates (20,21).

Overall, the findings indicate a substantial gap in breast cancer and breast self-examination knowledge among the surveyed nursing students. Within the limits of this single-Centre descriptive study, the results support closer attention to breast-health knowledge within nursing education and provide a basis for future multicentre research using clearly standardized knowledge measures and adequately powered samples (22)

CONCLUSION

The study found that most of the surveyed female nursing students had poor knowledge of breast cancer and breast self-examination, with only a minority classified as having good or satisfactory knowledge. These findings indicate an important breast-health knowledge gap within this study population and highlight the relevance of ensuring that nursing students receive adequate and accurate education on breast cancer awareness and breast self-examination as part of their professional preparation.

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