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Original Research Article

Knowledge and Practice of Breast Self-Examination among Female Undergraduate Medical Students: A Cross-Sectional Study in Eastern India

Dr. Riya Mondal[1*], Dr. Manish Roy[2], Dr. Diptangshu Roychowdhury[3]
[1*]Assistant Professor, Department of Community Medicine, Shri Ramkrishna Institute of Medical Sciences and Sanaka Hospital, Durgapur, West Bengal, India.
[2]Associate Professor, Department of Psychiatry, Shri Ramkrishna Institute of Medical Sciences and Sanaka Hospital, Durgapur, West Bengal, India.
[3]Assistant Professor, Department of Psychiatry, Shri Ramkrishna Institute of Medical Sciences and Sanaka Hospital, Durgapur, West Bengal, India.

Corresponding Author: Dr. Riya Mondal
Assistant Professor, Department of Community Medicine, Shri Ramkrishna Institute of Medical Sciences and Sanaka Hospital, Durgapur, West Bengal, India.

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ABSTRACT
Background: Breast cancer is the most common malignancy among women worldwide. Early detection significantly reduces morbidity and mortality. Breast self-examination (BSE) is a simple, cost-effective screening method; however, its practice remains inadequate.
Objectives: To assess the awareness and practice of breast self-examination and to evaluate the knowledge–practice gap among female undergraduate medical students.
Methods: A descriptive cross-sectional study was conducted among 93 female MBBS students at a tertiary care teaching hospital in Durgapur, West Bengal. Data were collected using a pre-tested structured questionnaire. Descriptive statistics were used, and a one-sample proportion test was applied. A p-value <0.05 was considered statistically significant.
Results: All participants were aware of breast cancer and its early detection methods. However, only 70% practiced BSE. A statistically significant knowledge–practice gap was observed ($Z = 5.79$, $p < 0.001$). The most common reason for non-practice was lack of knowledge regarding the correct technique (41%).
Conclusion: Despite universal awareness, the practice of BSE remains suboptimal. Structured, skill-based training interventions are required to bridge this gap.

Keywords: Breast Cancer; Breast Self-Examination; Knowledge–Practice Gap; Medical Students; Cross-Sectional Study.

INTRODUCTION

Breast cancer is the most commonly diagnosed cancer among women worldwide and remains a leading cause of cancer-related mortality.(1) According to global estimates, it accounts for a substantial proportion of cancer incidence and deaths among females, particularly in low- and middle-income countries.(1,2) Early detection plays a crucial role in improving survival outcomes, reducing disease burden, and minimizing the need for aggressive treatment.

Screening strategies such as mammography, clinical breast examination, and breast self-examination (BSE) are integral components of early detection programs (2). While mammography remains the gold standard in high-resource settings, its accessibility and affordability are limited in developing countries. In such contexts, BSE serves as a practical, cost-effective, and non-invasive method that enables women to detect early breast changes and seek timely medical care.(3)

Despite its simplicity and potential benefits, several studies have reported that although awareness of BSE is relatively high among women, its regular practice remains suboptimal.(4,5) This disparity between knowledge and actual practice is commonly referred to as the knowledge–practice gap,

which represents a significant barrier to effective early detection.

Medical students, as future healthcare professionals, are expected to possess adequate knowledge and demonstrate appropriate preventive health behaviors. Moreover, they play a pivotal role in educating patients and the community, thereby influencing public health outcomes.[6,7]

Hence, the present study was undertaken to assess the awareness and practice of breast self-examination and to evaluate the knowledge–practice gap among female undergraduate medical students.

MATERIALS AND METHODS

Study Design and Setting

A descriptive cross-sectional study was conducted among female undergraduate MBBS students at Shri Ramkrishna Institute of Medical Sciences and Sanaka Hospitals, Durgapur, West Bengal, India.

Study Population

Female undergraduate medical students who were present during the study period and consented to participate were included.

Inclusion Criteria

- Female MBBS students
- Willing to participate

Exclusion Criteria

- Students absent during data collection
- Those who did not provide consent

Sample Size Calculation

The sample size was calculated using the standard formula (8):

$$n = \frac{Z^2\, pq}{d^2}$$

Where Z = 1.96, p = 41%, q = 1−p, and d = 10%.

The calculated sample size was 93.

Sampling Technique

Simple random sampling was used to select participants.

Data Collection Tool

Data were collected using a pre-tested, structured, self-administered questionnaire adapted from validated Knowledge–Attitude–Practice (KAP) instruments on breast self-examination and breast cancer awareness.[4,5,10]

The Questionnaire Comprised Four Domains

- Socio-demographic details (age, family history of cancer, oral contraceptive use)
- Knowledge (risk factors, warning signs, early detection methods, and BSE technique)
- Attitude (perceptions and beliefs regarding BSE, assessed using a 5-point Likert scale)
- Practice (performance, frequency, and barriers related to BSE)

Knowledge items were assessed using multiple-choice and categorical responses (true/false/don't know). Attitude was measured on a 5-point Likert scale (strongly agree to strongly disagree), and practice was evaluated based on self-reported behavior.

The questionnaire was validated through expert review for content validity and pilot-tested among a subset of students. Necessary modifications were made to ensure clarity and reliability. Data were collected anonymously to minimize response bias.

Statistical Analysis

Data were analyzed using descriptive statistics (frequency and percentage). A one-sample proportion test was applied to assess the knowledge–practice gap. A p-value <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee. Informed consent was taken, and confidentiality was maintained.

RESULTS

A total of 93 female undergraduate medical students were included in the analysis. The findings are presented below in structured tables and graphs.

Characteristic	n	%
Total participants	93	100.0
Family history of cancer	27	29.0
Breast cancer among those with family history	9	33.3*
Oral contraceptive use	3	3.2

Table 1. Baseline characteristics of the study participants

*Percentage calculated among participants with family history of cancer (n=27).

Variable	n	%	95% CI	Inference
Awareness of breast cancer and early detection	93	100.0	96.1-100.0†	Universal awareness
Practiced BSE	65	69.9	60.5-79.2	Practice below awareness level
Knowledge-practice gap	-	-	-	Z = 5.79, p < 0.001

Table 2. Awareness, practice, and statistical summary of breast self-examination

†The lower confidence bound is shown because the observed awareness proportion was 100%.

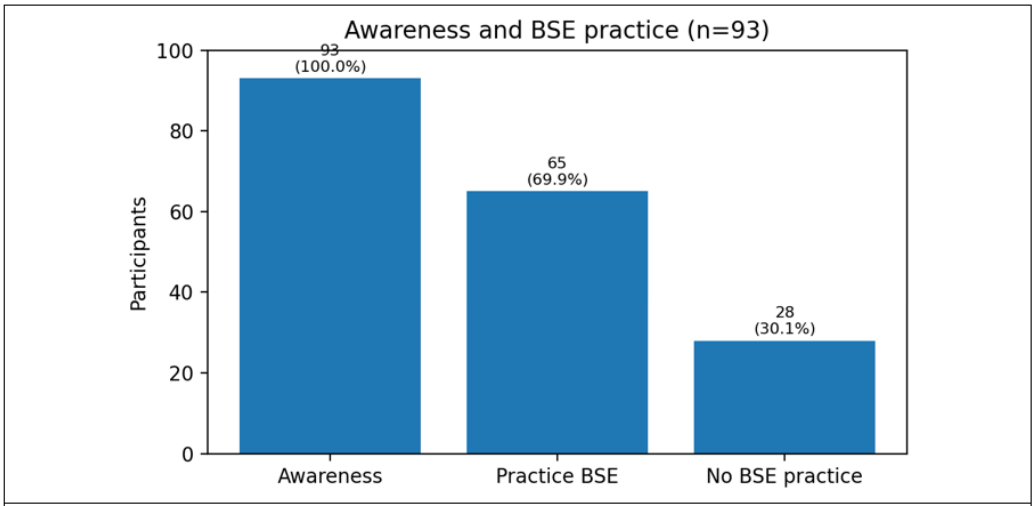

Figure 1. Awareness and practice of breast self-examination among participants (n=93)

Reason for non-practice	n	% (n=28)
Lack of knowledge regarding the correct procedure	11	39.3
Forgetfulness	8	28.6
Low perceived risk	6	21.4
Fear	3	10.7

Table 3. Reasons for non-practice of breast self-examination among non-practicing participants

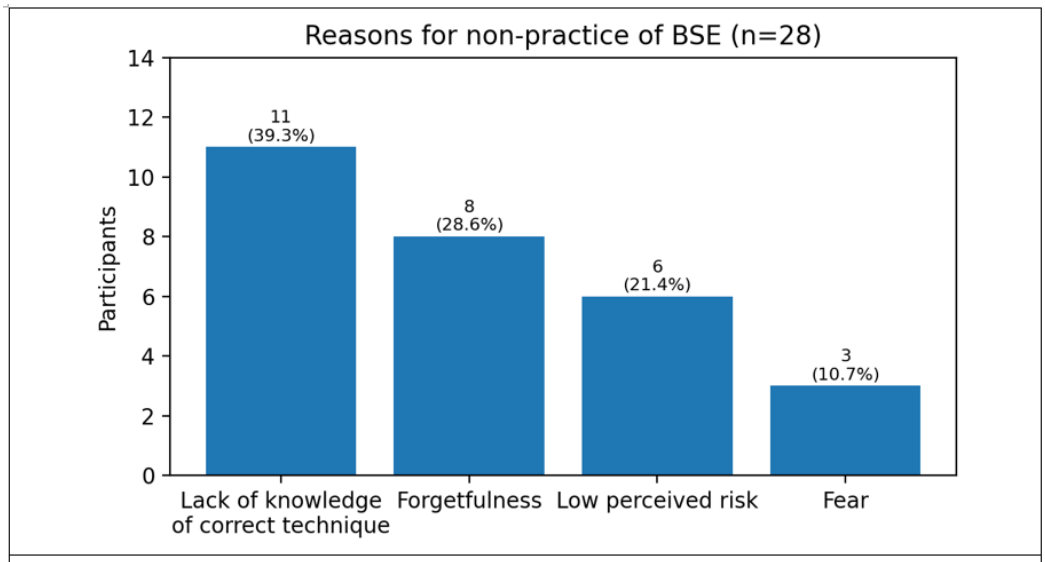

Figure 2. Distribution of reasons for non-practice of BSE among non-practicing participants (n=28)

Overall, awareness of breast cancer and its early detection methods was universal, but only 65 of 93 students (69.9%) reported practicing breast self-examination. The knowledge-practice gap was statistically significant ($Z = 5.79$, $p < 0.001$). Among the 28 students who did not practice BSE, lack of knowledge regarding the correct technique was the leading barrier.

DISCUSSION

The present study demonstrated universal awareness of breast cancer and breast self-examination (BSE) among female medical students; however, only 70% reported practicing BSE, indicating a significant knowledge–practice gap. This highlights that awareness alone does not necessarily translate into preventive health behavior.

These findings are consistent with earlier studies by Yerpude PN and Jogdand[4] and Doshi D et al. ,[5] which reported high awareness but substantially lower practice rates among medical and dental students. Similar observations across studies reinforce that knowledge without skill-based training is insufficient for behavioral adoption.

The prevalence of BSE practice in the present study (70%) is relatively higher than that reported in earlier Indian studies (30–60%),[4,5,7] possibly reflecting improved exposure to cancer education and digital health information. However, the persistence of non-practice indicates incomplete translation of knowledge into competency.

The most common barrier identified was lack of knowledge regarding correct technique (41%), consistent with findings from the National Cancer Institute[9] and Kumar et al.,[7] which emphasize that inadequate practical skills and lack of confidence are key deterrents. Additional barriers such as forgetfulness, low perceived risk, and fear further highlight the role of behavioral and psychological factors in preventive practices.

The statistically significant knowledge–practice gap ($Z = 5.79$, $p < 0.001$) observed in this study is comparable to findings from other populations (4,7), suggesting that this is a widespread issue. Addressing this gap requires a shift from didactic teaching to skill-based, demonstration-oriented training.

Given the role of medical students as future health educators, integrating structured BSE training, simulation-based learning, and peer-led demonstrations into the curriculum is essential. Evidence from the American Cancer Society supports that such interventions improve both knowledge retention and practice (6).

In conclusion, while awareness of BSE is high, regular practice remains suboptimal. Bridging the knowledge–practice gap through targeted educational and behavioral interventions is critical for improving early detection and reducing breast cancer burden.

CONCLUSION

Although awareness of breast cancer and BSE is universal among medical students, the practice remains suboptimal. A significant knowledge–practice gap exists.

Recommendations

- Incorporate skill-based BSE training in curriculum

- Conduct demonstration-based sessions
- Encourage regular practice and peer education

Limitations

- Small sample size
- Single-center study
- Self-reported data

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