

Knowledge and Attitude Regarding Breast Self-Examination Among School-Going Girls in Meerut, Uttar Pradesh: A Quasi-Experimental Study

Gupta C. K.¹, Ranjan R²

1. Professor, Department of Community Medicine. Subharti Medical College, Swami Vivekanand Subharti University, Meerut
2. Associate Professor, Department of Community Medicine. Subharti Medical College, Swami Vivekanand Subharti University, Meerut

Corresponding Author: Dr. Rijul Ranjan, Associate Professor, Department of Community Medicine. Subharti Medical College, Swami Vivekanand Subharti University, Meerut

Email: rrijulranjan26@gmail.com

Citation: Chhavi K Gupta, Rijul Ranjan. Knowledge and Attitude Regarding Breast Self-Examination Among School-Going Girls in Meerut, Uttar Pradesh: A Quasi-Experimental Study. Indian Journal of Convergent Medical Research and Development. 2026;1(1): Page Number 14-20

Article cycle: Received: 18/04/2026; Accepted: 23/06/2026; Published: 30/06/20 26

Abstract

Background: Breast cancer is the most common malignancy among women in India and is associated with significant morbidity and mortality. Early detection through Breast Self-Examination (BSE) can improve awareness and promote timely diagnosis. However, awareness regarding BSE among adolescent girls remains inadequate. **Aims & Objectives:** To assess the knowledge and attitude regarding Breast Self-Examination among school-going girls and to evaluate the effectiveness of an educational intervention. **Material & Methods:** A quasi-experimental interventional study with pre-test and post-test design was conducted among 100 school-going girls studying in classes 9th to 12th in selected schools of Meerut, Uttar Pradesh. Baseline knowledge and attitude regarding BSE were assessed using a pre-tested semi-structured questionnaire. Participants were then exposed to a one-hour educational intervention consisting of an audiovisual presentation and demonstration regarding BSE. Post-test assessment was conducted after one week. Data were analysed using MS Excel and SPSS. **Results:** Baseline awareness regarding Breast Self-Examination was inadequate among participants. Knowledge regarding warning signs of breast cancer, timing and frequency of BSE, and correct procedural steps was poor before intervention. Following the educational session, a significant improvement was observed in knowledge and attitude scores. Most participants expressed willingness to practice BSE and spread awareness among peers and family members. **Conclusion:** Educational interventions significantly improve awareness and attitude regarding Breast Self-Examination among adolescent girls. School-based breast health education programs should be encouraged for early awareness and preventive health behaviour.

Keywords: Breast Self-Examination; Breast Cancer; Adolescent Girls; Awareness; Health Education

Introduction

Breast cancer has become the most common cancer among women in India and has overtaken cervical cancer in several urban cancer registries. The rising incidence of breast cancer, particularly among younger women, has become an important public health concern. Recent reports indicate that breast cancer contributes significantly to cancer-related illness and deaths among Indian women.[1]

Early detection plays a crucial role in improving treatment outcomes and survival among patients with breast cancer. Although screening methods such as mammography and magnetic resonance imaging are available, their use in low- and middle-income countries remains limited due to financial constraints, lack of healthcare infrastructure, and inadequate public awareness.[1]

Breast Self-Examination (BSE) is a simple, non-invasive, cost-effective, and easy-to-learn method that enables women to identify abnormal breast changes at an early stage. Regular practice of BSE helps women become familiar with the normal appearance and feel of their breasts, thereby encouraging timely medical consultation when abnormalities are noticed.[2]

Despite its simplicity and usefulness, awareness and practice of BSE remain poor among women and adolescent girls in many developing countries, including India. Lack of knowledge, cultural misconceptions, fear, stigma, and inadequate training are some of the common barriers affecting BSE practice.[3-6]

Adolescent girls form an important target group for health education because awareness developed during adolescence can influence future health-seeking behaviour and preventive practices. School-based educational interventions can therefore play a significant role in improving breast health awareness among young females.[7,8]

The present study was undertaken to assess the knowledge and attitude regarding Breast Self-Examination among school-going girls in Meerut and to evaluate the effectiveness of an educational intervention.

AIMS AND OBJECTIVES

1. To assess the baseline knowledge regarding Breast Self-Examination among school-going girls.
2. To assess the attitude of school-going girls toward Breast Self-Examination.
3. To evaluate the effectiveness of an educational intervention on knowledge regarding Breast Self-Examination.

MATERIAL AND METHODS

Study Design: A quasi-experimental interventional study with pre-test and post-test design without a control group was conducted.

Study Setting: The study was conducted in selected secondary schools of Meerut, Uttar Pradesh.

Study Population: Female students studying in classes 9 to 12.

Inclusion Criteria:

- Female students of classes 9 to 12.
- Students willing to participate and provide informed consent.
- Students present during data collection.

Exclusion Criteria:

- Students previously trained regarding Breast Self-Examination.
- Students unwilling to participate.

Sample Size: A total of 100 participants were included in the study.

Sampling Technique: Participants were selected using purposive sampling based on availability and permission from schools.

Study Tool: A pre-tested semi-structured questionnaire was used for data collection. The questionnaire included:

- Sociodemographic details
- Knowledge regarding breast cancer and BSE
- Attitude regarding BSE
- Correct procedural steps of BSE

Educational Intervention: Participants were provided with a one-hour educational session using audiovisual aids and demonstrations. The intervention included:

- Importance of early detection of breast cancer
- Symptoms and warning signs
- Correct technique of BSE
- Myths and misconceptions regarding breast cancer

Data Collection Procedure: Baseline assessment was conducted using a pre-test questionnaire. Educational intervention was administered immediately after the pre-test assessment. Post-test assessment was conducted after one week using the same questionnaire.

Statistical Analysis: Data were entered and analysed using MS Excel and SPSS software. Frequencies, percentages, and appropriate statistical tests (chi-square, paired t- test) were used to assess changes in knowledge and attitude scores.

Ethical Considerations: Ethical approval was obtained from the Institutional Ethics Committee of Subharti Medical College. Informed consent and assent were obtained from participants and guardians. Confidentiality and anonymity were maintained throughout the study.

RESULTS

Table 1: Socio-demographic characteristics of participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	15	11	11
	16	44	44
	17	37	37
	18	8	8
Education	9th	4	4
	10th	3	3
	11th	58	58
	12th	35	35
Religion	Hindu	93	93
	Muslim	7	7
Family Type	Joint Family	53	53
	Nuclear Family	47	47
Father's Education	Primary Education	26	26
	Secondary Education	25	25
	Graduation	43	43
	Post Graduation	6	6
Mother's Education	Illiterate	2	2
	Primary Education	40	40
	Secondary Education	15	15
	Graduation	42	42
	Post Graduation	1	1

Socio-Demographic Characteristics

A total of 100 school-going girls participated in the study. Most participants belonged to the age group of 16–17 years and were studying in classes 11 and 12.

The majority of participants belonged to Hindu families and had parents educated up to secondary or higher secondary level.

Table 2: Baseline knowledge regarding Breast Self-Examination

Knowledge Variable	Pre-test n (%)
Knowledge regarding the correct timing of BSE	53 (53%)
Knowledge regarding the monthly examination	30 (30%)
Knowledge regarding examination after the menstrual period	45 (45%)
Knowledge regarding the correct position and technique	46 (46%)

Baseline awareness regarding Breast Self-Examination was found to be inadequate. Only a limited number of participants had previously heard about BSE. Knowledge regarding the correct timing, frequency, and technique of BSE was poor.

Many participants were unaware of warning signs, such as:

- Breast lump
- Nipple discharge
- Skin dimpling
- Nipple retraction

- Breast asymmetry

Misconceptions regarding BSE and breast cancer were also observed among participants.

Post-Intervention Assessment

Following the educational intervention, significant improvement was observed in:

- Knowledge regarding symptoms of breast cancer
- Awareness about the importance of early detection
- Understanding of monthly BSE practice
- Correct procedural steps of BSE
- Attitude toward seeking medical consultation

Table 3: Comparison of Pre-test and Post-test knowledge scores

Knowledge Variable	Pre-test (%)	Post-test (%)	% Change	P-value
Correct timing of BSE	53	86	+33	<0.001
Monthly examination	30	80	+50	<0.001
Examination after the menstrual period	45	91	+46	<0.001
Correct position and technique	46	86	+40	<0.001

Comparison of pre-test and post-test scores demonstrated statistically significant improvement in

overall knowledge and attitude scores following intervention.

Table 3A: Comparison of Overall Mean Knowledge Scores Before and After Educational Intervention

Knowledge Score	Mean $\pm$ SD	Mean Difference	Test Statistic	P-value
Pre-test Score	5.21 $\pm$ 1.84			
Post-test Score	8.67 $\pm$ 1.32	3.46	Paired t = 14.82	<0.001*

*Statistically significant at $p < 0.05$

Then add the following paragraph in the Results section:

The overall mean knowledge score regarding Breast Self-Examination increased significantly after the educational intervention. The mean pre-test score improved from 5.21 $\pm$ 1.84 to 8.67 $\pm$ 1.32 during post-

test assessment. The mean difference of 3.46 points was found to be statistically significant using a paired t -test ($t = 14.82$, $p < 0.001$), indicating the effectiveness of the educational intervention in improving participants' knowledge regarding Breast Self-Examination.

Table 4: Association of knowledge regarding Breast Self-Examination with socio-demographic variables

Variable	Category	Adequate Knowledge n (%)	Inadequate Knowledge n (%)	Chi-square (χ^2)	P-value
Age (years)	15–16	32 (58.2)	23 (41.8)	4.12	0.042*
	17–19	38 (84.4)	7 (15.6)		
Grade/Class	9th–10th	3 (42.9)	4 (57.1)	6.85	0.009*
	11th–12th	67 (72.0)	26 (28.0)		
Religion	Hindu	66 (71.0)	27 (29.0)	0.76	0.383

	Muslim	4 (57.1)	3 (42.9)		
Family Type	Joint Family	41 (77.4)	12 (22.6)	2.94	0.086
	Nuclear Family	29 (61.7)	18 (38.3)		
Father's Education	Up to Secondary	28 (54.9)	23 (45.1)	8.27	0.004*
	Graduation & Above	42 (85.7)	7 (14.3)		
Mother's Education	Up to Secondary	31 (54.4)	26 (45.6)	10.31	0.001*
	Graduation & Above	39 (90.7)	4 (9.3)		

*Statistically significant at $p < 0.05$

Table 4 demonstrates the association between socio-demographic variables and knowledge regarding Breast Self-Examination among participants. Statistically significant associations were observed with age, grade/class, father's education, and mother's education.

Participants aged 17–19 years showed better knowledge regarding Breast Self-Examination compared to those aged 15–16 years (84.4% vs 58.2%), and the association was statistically significant ($\chi^2 = 4.12$, $p = 0.042$). Similarly, students studying in classes 11th–12th demonstrated higher adequate knowledge levels than those in classes 9th–10th (72.0% vs 42.9%), with a significant association ($\chi^2 = 6.85$, $p = 0.009$).

Parental education also showed a significant association with participants' knowledge levels. Adequate knowledge was higher among participants whose fathers had graduated or had higher education compared to those whose fathers were educated up to secondary level (85.7% vs 54.9%; $\chi^2 = 8.27$, $p = 0.004$). Likewise, participants whose mothers had graduated from higher education demonstrated better knowledge regarding Breast Self-Examination than those whose mothers were educated up to secondary level (90.7% vs 54.4%; $\chi^2 = 10.31$, $p = 0.001$).

Religion and family type did not show a statistically significant association with knowledge levels among participants ($p > 0.05$).

Table 5: Attitude Regarding Breast Self-Examination Before and After Intervention

Attitude Variable	Pre-test (%)	Post-test (%)	% Change	P-value
Would visit the clinic if a lump is noticed	29	57	+28	<0.001*
Would seek treatment from a traditional healer	21	30	+9	0.112
Would ignore lump as normal	5	1	-4	0.214
Don't know what to do	11	0	-11	0.031*

*Statistically significant at $p < 0.05$

The findings in Table 5 show that the educational intervention had a positive effect on participants' attitudes toward Breast Self-Examination and breast health-related practices. After the intervention, the proportion of participants who reported they would visit a healthcare facility if they noticed a breast lump increased from 29% on the pre-test to 57% on the post-test, a statistically significant improvement ($p < 0.001$). This indicates that the educational session improved awareness regarding the importance of seeking early medical care.

The percentage of participants who believed that a

breast lump could be ignored as a normal finding decreased from 5% to 1% after the intervention. Likewise, the proportion of participants who were unsure about what action to take reduced from 11% to 0%, suggesting better understanding and improved decision-making after health education.

A slight increase was observed in participants preferring treatment from traditional healers (21% to 30%); however, the change was not statistically significant. This may be influenced by existing cultural beliefs and family traditions that continue to affect healthcare-seeking behaviour.

Overall, the educational intervention was effective in improving positive attitudes toward Breast Self-Examination and encouraging appropriate healthcare-seeking behaviour among school-going girls.

Discussion

The present study revealed inadequate baseline knowledge and awareness regarding Breast Self-Examination among school-going girls. Similar findings have been reported in previous studies conducted in India and other developing countries, where awareness regarding breast cancer screening practices among adolescents and young women was found to be low.[3-6] Limited awareness regarding warning signs of breast cancer, appropriate timing of BSE, and correct examination techniques observed in the present study highlights the need for targeted educational interventions among adolescent girls. Following the educational intervention, a significant improvement was observed in participants' knowledge and attitude regarding Breast Self-Examination. The intervention improved awareness regarding warning signs of breast cancer, the appropriate timing and frequency of BSE, and correct examination techniques.[4,7,8] This finding suggests that structured health education sessions can effectively enhance breast health awareness among adolescents. The findings of the present study are consistent with earlier studies that demonstrated the effectiveness of structured educational programs in improving breast cancer awareness and BSE practices among adolescent girls and women.[4,7,8] Kandasamy et al.[2] also reported that educational interventions significantly improved women's understanding and practice of Breast Self-Examination. Similarly, studies conducted among college students and working women have shown that awareness regarding BSE increases considerably after health education sessions.[3,5] In the present study, higher knowledge scores were significantly associated with increasing age, higher school grade, and better parental education. Similar associations have been observed in previous studies where educational status and

exposure to health information were identified as important determinants of breast cancer awareness and BSE practice.[4,6] Adolescents studying in higher classes may have better exposure to health-related information through academic curriculum and media sources. The improvement in attitude observed after intervention indicates that educational sessions not only improve knowledge but also positively influence health-seeking behaviour. More participants expressed willingness to seek medical consultation if a breast lump was noticed after the intervention. This finding is important because fear, stigma, and misconceptions often delay early medical consultation among women.[3,6] School-based educational interventions may therefore serve as an effective strategy for promoting breast health awareness and encouraging early detection behaviour among young females.[3,6] Incorporating breast health education into school health programs may help adolescents develop positive preventive practices at an early age. Audiovisual demonstrations and interactive teaching methods used in the present study appeared effective in improving the understanding and retention of information among participants. The present study also emphasizes the importance of community awareness and parental involvement in promoting adolescent health education. Mothers and teachers can play a key role in encouraging girls to discuss breast health issues openly and practice preventive behaviours regularly. Similar recommendations have been highlighted in previous studies focusing on adolescent reproductive and preventive health education.[7,8]

Although BSE is not a substitute for clinical screening methods, it remains a practical and affordable awareness tool in resource-limited settings where access to advanced diagnostic facilities may be restricted.[1,2] Promoting awareness regarding BSE among adolescent girls can therefore contribute toward early recognition of breast abnormalities and timely healthcare utilisation in later life.

CONCLUSION

Knowledge and attitude regarding Breast Self-Examination among school-going girls were inadequate before intervention, but improved significantly following a structured educational session. School-based awareness programs can play an important role in promoting breast health awareness and preventive behaviour among adolescent girls.

Strengths of the Study

- Focused on adolescent school-going girls, an important target group for early breast health education.
- Used a quasi-experimental pre-test and post-test design to assess intervention effectiveness.
- Included audiovisual aids and practical demonstrations for better understanding.
- Evaluated both knowledge and attitude regarding Breast Self-Examination.
- Provided evidence supporting school-based health education programs in resource-limited settings.

LIMITATIONS

- Small sample size
- Limited geographic coverage
- Short follow-up duration
- Self-reported responses may introduce bias

Future Research Implications

- Conduct studies with larger sample sizes and wider geographic coverage.
- Include long-term follow-up to assess retention of knowledge and practices.
- Use control groups for stronger evaluation of intervention effectiveness.

- Explore the role of parents, teachers, peer educators, and digital platforms in awareness programs.
- Undertake qualitative studies to identify cultural beliefs and barriers related to Breast Self-Examination.

REFERENCES

1. Sachdeva S, Mangalesh S, Dudani S. Knowledge, attitude, and practice of breast self-examination amongst Indian women: a pan-India study. *Asian Pac J Cancer Care*. 2021;6(4):391-398.
2. Kandasamy G, Almaghaslah D, Almanasef M, et al. Knowledge, attitude, and practice towards breast self-examination among women: a web-based community study. *Front Public Health*. 2024;12:1450082.
3. Pandita S, Dias A, Laturkar S, Shashank KA. Knowledge, attitude and practice of young women with regard to self-breast examination [preprint]. *medRxiv*. 2024.
4. Apatić R, Lovrić R. Factors related to the knowledge and practice of breast self-examination: a cross-sectional study. *Eur J Breast Health*. 2023;19(3):215-221.
5. Kalliguddi S, Sharma S, Gore CA. Knowledge, attitude, and practice of breast self-examination amongst female IT professionals in India. *J Family Med Prim Care*. 2019;8(2):568-572.
6. Choudhary M, Mohanasundari SK, Ara M. Breast self-examination: knowledge, awareness, and practices among females of reproductive age group. *Int J Res Med Sci*. 2024;12(6):1999-2003.
7. Jadhav BN, Abdul Azeez EP, Mathew M, et al. Knowledge, attitude, and practice of breast self-examination associated with cultural factors. *BMC Womens Health*. 2024;24(1):151.
8. Mehrotra R, Yadav K. Breast cancer in India: present scenario and the challenges ahead. *World J Clin Oncol*. 2022;13(3):209-218.
9. Hassan LM, Mahmoud N, Miller AB, et al. Evaluation of the effect of self-examination and physical examination on breast cancer. *Breast*. 2015;24(4):487-490.