

# Role of Interactive Educational Program on Knowledge Gaps about Breast Cancer, Breast Self-Examination and Health Behaviors among Teachers and Students

Zunaira Bashir, Muhammad Saifullah and Madiha Mukhtar

## ABSTRACT

**Objective:** To assess the breast cancer knowledge and practice of breast self-examination among students and teachers of high school and to determine the impact of educational intervention on breast cancer knowledge, practice of breast self-examination and behaviour outcomes among students and teachers of high school

**Study Design:** Quasi-experimental pre- and post-intervention study

**Place and Duration of Study:** This study was conducted at the Government Girls High School Ram Ke Chattha, Hafizabad Punjab from 1<sup>st</sup> July 2025 to 30<sup>th</sup> December 2025.

**Methods:** The population included 200 school students and 15 female teachers selected through purposive sampling, ensuring participants met inclusion criteria such as age, willingness to participate, and absence of prior breast self-examination training.

**Results:** Post-intervention findings revealed statistically significant improvements in both knowledge and practice scores among students and teachers ( $p < 0.05$ ). The interactive educational workshop effectively bridged knowledge gaps, increased awareness, and promoted positive behavioral intentions regarding breast health and self-examination practices.

**Conclusion:** The educational intervention demonstrated a substantial impact in enhancing breast cancer awareness and breast self-examination practice among high school students and teachers. Integrating structured health education programs into school curricula can serve as a sustainable strategy for early detection and long-term cancer prevention.

**Key Words:** Breast Cancer, Breast self-examination, Schools health promotion

**Citation of article:** Bashir Z, Saifullah M, Mukhtar M. Role of Interactive Educational Program on Knowledge Gaps about Breast Cancer, Breast Self-Examination and Health Behaviors among Teachers and Students. Med Forum 2026;37(4):30-34. doi:10.60110/medforum.370406.

## INTRODUCTION

Breast cancer remains one of the most commonly diagnosed and life-threatening malignancies among women worldwide, with over 2.3 million new cases reported annually.<sup>1</sup> Early detection significantly improves prognosis, with survival rates exceeding 90% when the disease is identified in its initial stages.<sup>2</sup> Despite advancements in screening technologies, a large proportion of women in low- and middle-income countries (LMICs) are still diagnosed at advanced stages due to limited awareness, sociocultural barriers, and inadequate access to screening services.<sup>3</sup>

---

Lahore School of Nursing, The University of Lahore.

---

Correspondence: Zunaira Bashir, MSN Scholar, Lahore School of Nursing, The University of Lahore, Pakistan.  
Contact No: +92 3481582343  
Email: zunairabashir@gmail.com

---

Received: January, 2026  
Reviewed: February, 2026  
Accepted: March, 2026

---

This highlights the urgent need for public health strategies focused on awareness, early identification, and preventive behaviors.

Globally, disparities in breast cancer incidence and mortality persist between high-income countries and LMICs. Regions such as the United States and Canada report high five-year survival rates, largely due to widespread screening and strong health systems.<sup>4</sup> However, countries in South Asia and sub-Saharan Africa continue to experience delayed diagnoses and higher mortality because of limited resources and insufficient public health education.<sup>5</sup> As populations grow and age, these gaps are expected to widen, underscoring the need for scalable, affordable, and culturally sensitive educational interventions that promote breast health literacy.

In Pakistan, breast cancer has become a major public health concern, with approximately 90,000 new cases and 40,000 deaths reported annually - the highest incidence in South Asia.<sup>6</sup> Nearly 70% of women present with late-stage disease, reflecting poor awareness and inadequate screening practices, particularly in rural districts such as Hafizabad.<sup>7,8</sup>

Awareness of breast cancer and breast self-examination (BSE) remains low among adolescents and adults, further contributing to delayed diagnosis. High school students and teachers represent a critical population for health education because they can disseminate essential knowledge within families and communities.

Educational interventions have shown promising results in improving knowledge of breast cancer and increasing the correct practice of BSE among young women, teachers, and community groups. Structured programs incorporating audiovisual sessions and hands-on demonstrations have been found to increase BSE knowledge by up to 80% and practice rates by more than 60%.<sup>9,10</sup> Teachers who participate in such interventions also demonstrate improved confidence and skill in educating students, creating a multiplier effect within the school environment.<sup>11</sup> These findings reinforce the importance of school-based initiatives as an effective platform for enhancing early detection behaviors.

Given the persistent gaps in breast cancer literacy and the absence of structured awareness programs in schools, targeted educational interventions are essential for empowering young women and educators with life-saving knowledge and skills. Enhancing BSE practice and awareness at the high school level not only promotes early detection but also aligns with national health priorities aimed at reducing breast cancer morbidity and mortality. For the nursing profession, such initiatives strengthen community engagement and highlight the vital role nurses play in preventive health education. Therefore, this study aims to assess the effects of an educational intervention on breast cancer knowledge and BSE practices among high school students and teachers in the Hafizabad District, ultimately contributing to improved public health outcomes.<sup>12,13</sup>

## METHODS

This pre and post intervention quasi-experimental research was done in Government Girls High School Ram Ke Chattha, Hafizabad, Punjab, Pakistan from 1<sup>st</sup> July 2025 to 30<sup>th</sup> December 2025 with the ethical approval granted by the Institutional Review Board of the University of Lahore (Ref. No. UOL/IREB/25/09/0022; dated 30 June 2025). There were 200 school female students and 15 female high school teachers in total, but purposive sampling of the sample was conducted based on preset inclusion criteria. The school administration gave formal consent before data collection and the teachers were given written informed consent together with parental or guardian consent to students. The data will be collected with structured questionnaires and checklists modified based on tested instruments while following the recommendations of the educational guidelines of the WHO and American Cancer Society. The data

collection tool included 3 parts: a breast cancer knowledge scale of 27 questions (correct response = 1, incorrect response = 0), a checklist on breast self-examination (BSE) practice with 11 items measuring the practice accuracy and a scale of 10 Likert-type items to measure the adherence to the preventive practices. The overall scores were classified into bad, average, good and excellent according to previously predetermined cut-off points. The first step was a baseline pre-assessment, which was aimed at assessing the demographic features of the participants, their knowledge of breast cancer, current BSE habits, and preventive measures.

A systematic educational program was administered in groups of four-45 minutes sessions following the assessment of the baseline. The activities involved breast cancer awareness, demonstration of breast anatomy and BSE technique using anatomical models, the barriers and lifestyle factors were discussed and practical training supervised by role play and interactive discussions. The post intervention test using the same questionnaire was conducted immediately after intervention to measure the knowledge and changes in practices. One month after, a follow-up evaluation was done using the preventative behavior scale in order to establish the sustainability of the behavior change.

All the data gathered were analyzed through the Statistical Package of Social Sciences (SPSS) version 25.0. Frequencies and percentages summarized the demographic characteristics and categorical variables by means of descriptive statistics. Kolmogorov-Smirnov test on students and Shapiro-Wilk test on teachers were used to test the normal distribution of data; both tests had p below 0.05, which implied that non-parametric statistics was used. Comparison of pre-intervention and post-intervention results in terms of knowledge and BSE practice was carried out with Mann-Whitney U test and McNemar test. A p-value of below 0.05 was considered statistically significant.

## RESULTS

A total of 200 students and 15 teachers participated in the study. The majority of students were aged 15–19 years (80.0%), while the remaining 20.0% were between 20–24 years. In contrast, teachers were generally older, with more than half (53.3%) aged above 30 years, 33.3% between 25–30 years, and 13.3% between 20–24 years. Regarding ethnicity, most students were Punjabi (88.0%), followed by Pakhtun (7.0%) and Sindhi (5.0%). All teachers (100.0%) were Punjabi. Family history was reported by 8.0% of students and 46.7% of teachers. Among those with a positive family history, the mother was identified as the affected family member in 37.5% of students and 28.6% of teachers. (Table 1)

Among the 200 students, baseline assessment revealed that all participants (100.0%) had poor knowledge regarding breast cancer and demonstrated poor breast self-examination (BSE) practices. Following the educational intervention, a substantial improvement was observed in both domains. Post-intervention, only 5.0% of students remained in the poor knowledge category, while 38.0% achieved average knowledge and 57.0% demonstrated good knowledge. Similarly, BSE practices improved markedly, with poor practices decreasing from 100.0% at baseline to 34.0% post-intervention. After the intervention, 42.0% of students demonstrated average practices and 24.0% achieved good practice levels. The improvements in both knowledge and practice were statistically significant ( $p < 0.001$ ), indicating a strong positive effect of the educational intervention. (Table 2)

Following the educational intervention, the post-intervention assessment of preventive health behaviors among the 200 students showed that the majority demonstrated positive behaviors. Specifically, 51.5% of students exhibited good preventive health behaviors, while 6.5% reached an excellent level. Meanwhile,

34.0% displayed poor behaviors, and 8.0% fell into the very poor category (Fig. 1).

The pre and post intervention scores were compared to show that there was a statistically significant increase in the knowledge of the teachers and students about breast cancer as well as an increased practice in breast self-examination (BSE) after the educational intervention. Median scores of teachers were significantly higher in knowledge (45.00 vs. 126.00) and BSE practice (46.50 vs. 124.50), and the results were highly significant ( $p = 0.000$ ), which showed significant improvements in awareness and practice. On the same note, there was significant improvement in the students, as median knowledge score went up to 5146.00 and the BSE practice score went up to 5704.00 after intervention compared to the situation before the intervention in 2604.00 and 2046.00 respectively. All the resulting p-values of statistical significance ( $p < 0.05$ ) prove the existence of a strong positive impact of the structured educational program on the improvement of both cognitive understanding and preventive health behaviors among the participants (Table 3).

**Table No. 1: Demographics of students and teachers**

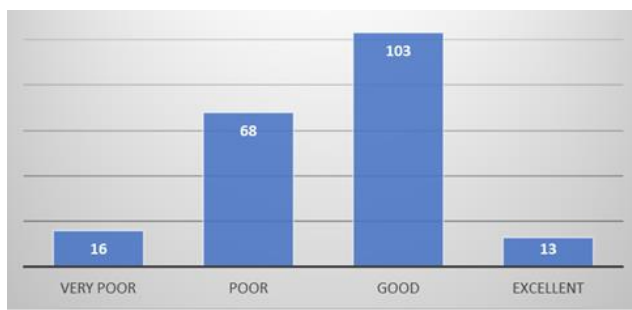
Variable	Category	Students (n = 200)	Teachers (n = 15)
Age (years)	15–19	160 (80%)	—
	20–24	40 (20%)	2 (13.3%)
	25–30	—	5 (33.3%)
	>30	—	8 (53.3%)
Ethnicity	Punjabi	176 (88%)	15 (100%)
	Pakhtun	14 (7%)	—
	Sindhi	10 (5%)	—
Family History	Yes	16 (8%)	7 (46.7%)
	No	184 (92%)	8 (53.3%)
If family history present (n=16 students; n=7 teachers)	Mother	6 (37.5%)	2 (28.6%)

**Table No. 2: Effect of Educational Intervention on Knowledge and Breast Self-Examination Practices Among Students (n = 200)**

Outcome Variable	Level	Pre-Intervention	Post-Intervention	p-value*
Knowledge regarding breast cancer	Poor	200 (100%)	10 (5%)	<0.001
	Average	-	76 (38%)	
	Good	-	114 (57%)	
Practice of breast self-examination	Poor	200 (100%)	68 (34%)	<0.001
	Average	-	84 (42%)	
	Good	-	48 (24%)	

**Table No. 3: Comparison of pre and post intervention scores among students**

Participants	Outcome Variable	Median (Pre-intervention)	Median (Post-intervention)	Mann–Whitney U	P-value
Teachers (n=15)	Knowledge towards breast cancer	45.00	126.00	0.000	0.000*
	Practice towards BSE	46.50	124.50	1.500	0.000*
Students (n=200)	Knowledge towards breast cancer	2604.00	5146.00	93.000	0.000*
	Practice towards BSE	2046.00	5704.00	651.000	0.000*



**Figure No. 1: Preventive health behaviors outcome variable among students**

**DISCUSSION**

The demographic features of the current study indicate a representative school based population in Pakistan, with the majority of students being in late adolescence whilst the teachers were of a more professional mature population. The high rural rates of the participants could account for the low awareness of breast cancer and the lack of preventive behaviors at the early stage since in the past researchers have focused on the low access to health information and sociocultural hindrances in rural areas.<sup>14,15</sup>

Along with the advance in knowledge, breast self-examination among students increased significantly at the post intervention stage. There are also similar results in Ethiopia and Saudi Arabia where participatory educational strategies and demonstrations served as an important aspect of improving BSE performance in adolescents and university students aged.<sup>16-18</sup> The transformation of the universal poor practice into the enhanced engagement indicates that the training based on skills and the establishment of confidence are essential in facilitating preventive behaviors. Nevertheless, the fact that there are still some poor preventive practices points towards the possibility that a long-term follow-up and reinforcement might be required to ensure behavioral change in the long term.<sup>19,20</sup>

The stronger outcomes at the end of the intervention may be involving teachers educational background and their role as community influencers that may be seen in comparison to the outcome in case of community-based population in the future.<sup>15</sup> The teachers used in the present study also showed notable gains in knowledge, practice of breast self-examination, and preventive behavior, which enhances their position as major facilitators of health promotion in the academic setting. Similar gains have been documented among teachers in Kuwait, Nigeria, and Pakistan where organized training programs have improved awareness and actual involvement in breast health practices, both of which have been shown to be effective in these countries.<sup>16,21,22</sup>

The beneficial shift in general preventive health behavior among the students also identifies the evidence that educational interventions can redefine the

health attitudes and self-care among adolescents.<sup>23</sup> However, the existence of poor or very poor behavior students puts emphasis on incorporating the constant health education in the school systems to ensure long term compliance. The results showed a significant change in the level of knowledge among students after the educational intervention, which was consistent with earlier reports that organized awareness campaigns are effective ways of filling the gaps of breast cancer literacy knowledge in young females. Similar results have been documented in studies in Pakistan which have indicated that interactive education has a significant effect in increasing the knowledge of risk factors, symptoms and early detection practices.<sup>22,23</sup>

The substantial change in preventive health practices among teachers can be compared to the results of research held in Saudi Arabia and Turkey where it was stated that educative intervention resulted in long-term embracement of screening procedures and lifestyle changes. These results underscore the possibility of empowering teachers as health awareness propagators to increase the influence of interventions on the participants to the rest of the school.<sup>18,24</sup>

Statistical results proved the effectiveness of the structured educational programs in improving the cognitive and behavioral outcomes by showing the significant improvements in knowledge and practice scores after the intervention. Findings are congruent with the international literature that has stressed that skill-based and culturally sensitive educational approaches have the potential to enhance the gap in knowledge and facilitate preventive health practices in both adolescents and teachers.<sup>25- 27</sup> In general, the current research contributes to the existing evidence that incorporating breast health education at schools and in school curricula and teaching helps to address the issue.

**CONCLUSION**

The study clearly demonstrates that interactive educational workshops play a transformative role in bridging knowledge gaps about breast cancer, breast self-examination and preventive health behaviors among both teachers and students. The intervention resulted in a remarkable improvement in awareness, understanding, and practical engagement, affirming the power of participatory and experiential learning in promoting sustainable health behaviors. By fostering an environment of open dialogue and skill-based learning, these workshops empowered teachers to become informed health advocates and students to adopt proactive attitudes toward self-care.

**Author’s Contribution:**

Concept & Design or acquisition of analysis or interpretation of data:	Zunaira Bashir, Muhammad Saifullah
Drafting or Revising	Zunaira Bashir,

Critically:	Madiha Mukhtar
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**Source of Funding:** None

**Ethical Approval:** No. UOL/IREB/25/09/0022; Dated 30.06.2025

## REFERENCES

- Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2021;71(3): 209-49.
- World Health Organization. Breast cancer: Early detection and screening [Internet]. Geneva: WHO; 2023,24.
- Bray F, Ferlay J, Laversanne M, Brewster DH, Gombe Mbalawa C, Kohler B, et al. Cancer incidence in five continents: Global patterns and trends. *Int J Cancer* 2021;148(6):1239-50.
- Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. *CA Cancer J Clin* 2022;72(1):7-33.
- Joko-Fru Y, et al. Breast cancer in sub-Saharan Africa: Epidemiology and survival. *Lancet Oncol* 2021;22(9):e395-403.
- Bhurgrī Y, Ahmed R, Khan S. Rising trends of breast cancer in Pakistan: An epidemiological perspective. *J Coll Physicians Surg Pak* 2021; 31(4):389-94.
- Ibrahim A, Rauf S, Majeed S. Factors associated with delayed diagnosis of breast cancer in Pakistan. *J Cancer Res Ther* 2022;18(4):950-5.
- Riaz A, Hassan S, Javed F. Barriers to breast cancer awareness and screening in rural Punjab. *Pak J Rural Health* 2022;4(2):75-82.
- Khan M, Tariq S, Hussain A. Effectiveness of multimedia-based breast cancer education among Pakistani adolescents. *J Sch Health* 2023;93(4): 310-8.
- Farooq S, Akhtar H. Effectiveness of school-based interventions on breast self-examination practices among adolescent girls. *J Educ Health Promot* 2023;12(1):120-8.
- Fatima R, Ali S, Batool H. Improving breast self-examination skills among rural school teachers through structured training. *Int J Community Med Public Health* 2022;9(6):2750-5.
- Khan H, Parveen R. Determinants of low breast cancer awareness in rural Punjab: A cross-sectional study. *Punjab Health Res J* 2024;8(1):60-71.
- Shah M, Farooq H. Predictors of breast cancer awareness among high school students in Pakistan. *Sch Health Res Bull* 2024;2(1):15-25.
- Abdulrahman A, Naji M. Effectiveness of structured breast cancer awareness training on female teachers' knowledge and self-examination practices. *J Health Educ Res* 2021;36(2):150-60.
- Ahmed S, Hassan R. Teachers' role in promoting breast cancer awareness: A cross-sectional study in Pakistani schools. *Pak J Health Educ* 2021;11(1): 45-55.
- Al-Mutairi A, Al-Mutairi S, Al-Faraj R. Impact of breast cancer education programs on knowledge and self-examination practices among female teachers in Kuwait. *Kuwait Med J* 2023;55(1): 23-31.
- Gebresillassie H, Tadesse T, Mekonnen W. School-based educational intervention to improve breast self-examination practice among adolescent girls in Ethiopia. *BMC Public Health* 2023;23 (1):256.
- Ameer H, Alqahtani N, Saleh F. Educational interventions for breast cancer awareness among female teachers in Saudi Arabia: Impact on preventive health behaviors. *Int J Nurs Educ* 2023;15(2):88-96.
- Al-Otaibi A, Al-Mutairi N, Al-Jabri A. Effect of structured breast self-examination training on university students' practice in Saudi Arabia. *Saudi J Health Sci* 2022;11(3):105-12.
- Haque R, Rahman M. Sociocultural barriers to breast self-examination among adolescent girls in Bangladesh. *Asian Pac J Cancer Prev* 2021; 22(10):3171-8.
- Eze N, Okeke C, Chukwuma O. Effectiveness of school-based breast cancer awareness programs among teachers in Nigeria. *Afr J Health Promot* 2024;18(1):34-46.
- Iqbal S, Khan M, Ali F. Impact of targeted breast cancer educational interventions on preventive health behaviors among nursing faculty and students in Pakistan. *J Nurs Educ Pract* 2021; 11(7):45-53.
- Khan M, Rehman T, Ali F. Effectiveness of structured breast cancer awareness programs on knowledge and practice among female students in Pakistan. *J Sch Health* 2023;93(6):456-65.
- Yilmaz G, Durmus O. Effect of structured breast health education on women's preventive behaviors. *J Prev Med* 2022;17(2):102-10.
- Nasir S, Rehman A, Tariq S. Effectiveness of educational programs on breast self-examination practices among nursing students in Pakistan. *J Nurs Educ* 2021;60(3):145-52.
- Oluwatosin O, Oladepo O. Teachers' participation in breast cancer education interventions in Nigeria: Knowledge and practice outcomes. *Health Educ Res* 2021;36(5):412-22.
- Tariq S, Ahmed R, Khan H. Enhancing breast cancer awareness through structured educational sessions among Pakistani women. *Pak J Health Promot* 2022;10(1):30-40.