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Enhancing Breast Self-Examination Awareness Among Non-Medical and Non-Paramedical Female Students: Evaluating Knowledge Levels, Providing Educational Interventions and Demonstration

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ABSTRACT
Breast Self-Examination (BSE) is a simple, cost-effective, and non-invasive method that women can perform regularly to detect unusual changes in their breasts. Despite being a potentially life-saving habit, BSE is often underutilized, particularly among young women who are not part of the medical or paramedical fields and may lack exposure to basic health education. Encouraging the practice of BSE can empower women with the ability to detect abnormalities early and seek medical attention promptly. The aim of the study is to assess the baseline knowledge levels of non-medical and non-paramedical female students regarding BSE, to evaluate the impact of the educational intervention on post-test knowledge levels, to identify associations between selected socio-demographic variables and baseline BSE knowledge. The study involved 150 non-medical and non-paramedical female students, mostly young adults aged 17–24, with a balanced mix of undergraduates and postgraduates, and an even split between rural and urban residences. Baseline results showed that nearly half of the students had only average knowledge of breast self-examination (BSE), with none reaching a 'very good' level before the intervention, despite varied information sources like healthcare providers, media, and schools. After a structured educational session with demonstrations, 74.7% of participants achieved 'very good' knowledge scores, and 25.3% scored in the 'good' category, indicating a significant improvement. The analysis showed no strong link between baseline knowledge and factors like age, BMI, residence, or information source, though education level and marital status showed trends toward significance. Overall, the results highlight that targeted education can greatly improve BSE awareness among young women, bridging gaps across different socio-demographic groups.

Keywords: *Breast Self-Examination (BSE), Educational Intervention, Knowledge Assessment, Non-Medical Female Students, Health Education.*

INTRODUCTION

Breast Self-Examination (BSE) is a simple, cost-effective way for women to take charge of their own breast health by regularly checking for early signs of abnormalities. While BSE does not replace professional screenings, it helps women notice unusual changes early, which can lead to timely diagnosis and treatment something that can truly save lives, especially in countries where advanced diagnostic tools are not always accessible. A study at a private university in Southern Nigeria demonstrated that targeted educational interventions significantly improved female students' knowledge, attitude, and practice of breast self-examination (BSE), emphasizing the value of structured health education in university settings [1]. However, individual BSE behaviours are shaped by factors such as age, knowledge level, and family history of breast cancer, indicating that socio-demographic and psychosocial elements must be considered when designing effective programs [2]. The proven success of theory-based models like the Health Belief Model and Theory of Planned Behaviour in increasing BSE practice highlights the importance of grounding interventions in behaviour change frameworks [3]. Despite this, a cross-sectional study at the University of Dodoma found that many female undergraduates, though aware of BSE, rarely practiced it correctly, demonstrating persistent knowledge–practice gaps [4]. Advances in digital education have opened new pathways for health promotion, with virtual interventions based on self-efficacy showing significant improvements in BSE performance [5].

A 2024 study in Indonesia found that many female students lacked awareness and understanding of BSE's role in early cancer detection, revealing a critical gap that schools must address [11]. Similarly, research in India and Delhi-NCR showed that while awareness exists, proper practice is lacking, underscoring the need for culturally tailored, structured, hands-on BSE education in colleges [20][22]. These previous studies

showed an increasing need for BSE awareness and educational interventions to be included into curriculums for students benefits and knowledge.

The study that was conducted among Turkish nursing students showed that hands-on BSE training with simulation breast models dramatically improved their practice accuracy, knowledge, and confidence, proving the value of tactile learning in health education [51]. Similarly, Dündar et al. study found that even a short demonstration session could significantly boost Turkish women's BSE knowledge and motivate regular practice, though they noted the need for follow-up to assess lasting impact [58].

MATERIALS AND METHODS

The study adopted Quantitative research approach and pre-experimental research design using a one-group pre-test, post-test to evaluate the effectiveness of an educational intervention on breast self-examination (BSE). The research study was conducted at Parul University, targeting female students as the study research setting. The sample comprised of 150 non-medical and non-paramedical female students aged 17 to 24 years who meet the studies' inclusion criteria. The stratified random sampling technique was employed to select the sample. Variables for the quantitative study included the independent variable (educational intervention) and the dependent variable (knowledge levels regarding BSE). The research tool description contained section A; questionnaire to generate participants socio-demographic profile like age, education, body mass index BMI, marital status, source of information. Section B; Consisted of the structured knowledge questionnaire to assess participants knowledge of breast self-examination. Content validity was established by developing a self-structured questionnaire based on current literature and guidelines of BSE that were reviewed by experts in the nursing field to ensure relevance and comprehensiveness. The pilot study was conducted where the tool was tested on a small group with similar characteristics to ensure and confirm its effectiveness to the study objectives and the reliability score of 0.87 was found. Ethical approval was obtained from the Paul University International Ethical Committee for Human Research with approval no PUIECHR/PIMSR/00/081734/7920. Informed consent was collected from all participants prior to data collection to ensure a strong maintenance of confidentiality and anonymity. Data collection was conducted in a systematic chronological context of pretest session, intervention session and post-test session, that was presented into three parts; the descriptive statistics including frequency counts and percentages were used to describe and summarize participants socio-demographic variables, the comparative t-test of pretest and post-test knowledge scores and the chi-square to test the association between pretest knowledge and demographic variables.

RESULTS

The study focused on 150 participants who were mostly young women aged 17–19 (36.7%), with undergraduates forming the largest education group (36%). Most had a healthy BMI (43.3% between 23–25 kg/m²), and the sample was nearly evenly split by marital status and rural or urban residence. Participants got BSE information mainly from healthcare providers (26.7%) and media (24%), but schools, family, and other informal sources also played key roles in raising awareness. Undergraduate students made up the largest group, comprising 36% of the sample and was closely followed by Postgraduate students at 34.7%, while 29.3% were classified under the "Other" education category. The study shows that a slightly higher proportion of participants were Unmarried (52.7%), while 47.3% were Married, reflecting a balanced marital status distribution in the sample. The majority of the respondents, 52% resided in Rural areas, whereas 48% belonged to Urban areas, indicating a fairly even representation from both settings. Findings suggest that Participants received BSE information from diverse sources, with healthcare providers being the most common at 26.7%, followed by media like TV and the internet at 24%. Schools or colleges contributed for 18.7% of participants, while family, friends, and other sources filled the remaining gaps. These findings highlight that both formal and informal channels are important for spreading breast health awareness.

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Figure 1. Graph representing distribution of participants pretest and posttest level of knowledge of Participants concerning Breast Self-Examination.

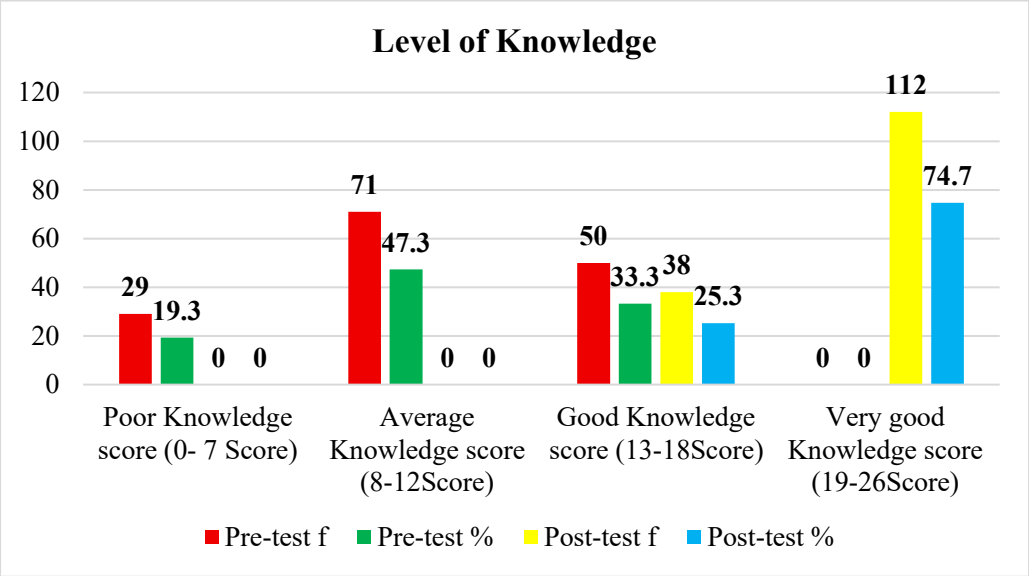

Table 1: Association between pretest knowledge score with selected demographic variables.

Demographic Data	Category	Pretest Level of Knowledge				Chi-Value	Df	p-Value
		Poor	Average	Good	Very good			
Age	17-19 Year	10	26	19	00	2.170	4	0.704
	20-22 Year	10	20	19	00			
	21-24 Year	09	25	12	00			
Level of Education	Undergraduate	10	32	12	00	8.655	4	0.070
	Postgraduate	10	25	17	00			
	Other	09	14	21	00			
Body Mass Index (Kg/m2)	25	10	23	15	00	4.404	4	0.354
	23-25	16	29	15	00			
	23	03	19	15	00			
Marital Status	Married	14	40	17	00	5.885	2	0.053
	Unmarried	15	31	33	00			
Types of residential area	Rural	18	31	29	00	3.877	2	0.144
	Urban	11	40	21	00			
Source of Information	School / College Education	06	15	07	00	2.331	8	0.969
	HealthCare Provider	08	16	16	00			
	Family member / Friend	04	11	6	00			
	Media (TV, Internet, etc.	07	17	12	00			
	Others	04	12	09	00			

The study highlights that there was no statistically significant association between participants' pretest knowledge about Breast Self-Examination (BSE) and their age, BMI, type of residential area, or source of information, while level of education and marital status showed trends nearing significance but did not reach it. Most participants across all demographics displayed average knowledge levels with no one achieving a "very good" score before the intervention. Unmarried participants and those with "Other" education backgrounds showed slightly higher good knowledge scores, but these differences were not

statistically significant. Overall, this suggests that baseline BSE knowledge was fairly uniform across the different demographic groups studied.

DISCUSSION

This quantitative study was carried out among 150 non-medical and non-paramedical female students at Parul University to assess their baseline knowledge of breast self-examination (BSE), measure the impact of an educational intervention, and examine associations with socio-demographic variables. The results showed that most students initially had only average knowledge about BSE, with none scoring in the highest category, but after the structured educational intervention, 74.7% reached a "very good" knowledge level while none remained in the poor or average groups. Notably, demographic factors such as age, BMI, residence, and information sources did not significantly affect baseline knowledge, though marital status and education level showed near-significant associations, suggesting that knowledge gaps existed across groups and confirming the need for inclusive awareness programs.

When compared with similar studies, A comparative analysis of related studies demonstrates that the findings of this thesis align closely with similar research across different contexts. For instance, Ur-untie et al. (2024) reported significant improvements in knowledge, attitude, and practice of breast self-examination (BSE) among 103 female undergraduates in Southern Nigeria after a multi-session intervention, mirroring this thesis's result where "very good" knowledge rose from 0% to 74.7% and poor or average knowledge dropped to 0%, reinforcing the effectiveness of structured educational interventions in non-health-science populations [70]. Likewise, Sarker et al. (2022) found statistically significant gains in BSE technique and awareness among 400 Bangladeshi university students, comparable to the current study's robust knowledge increase among 150 participants, proving that impactful results are achievable at different scales [71]. Together, these comparisons affirm that demonstration-based, theory-informed BSE education can bridge knowledge gaps broadly and equitably.

CONCLUSION:

The findings of the study clearly demonstrate that the baseline knowledge of breast self-examination (BSE) among non-medical and non-paramedical female students was generally low to moderate, with almost half of the participants scoring only average and a notable portion having poor understanding of BSE techniques and frequency. The demographics highlighted that students came from diverse age groups, educational backgrounds, and residential areas, yet these factors showed little significant association with their initial knowledge levels. The post-intervention illustrated a remarkable improvement in knowledge levels following the structured educational sessions and demonstrations. Overall, the results emphasize the crucial role of targeted educational programs in bridging knowledge gaps and promoting proper BSE practice among young women, thereby supporting early detection and better breast health outcomes in the long run.

Conflict of interest and funding

The research study has no conflict of interest and was entirely self-funded.

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