

Awareness, Attitude, Practice and Associated Factors of Breast Self-Examination - A Cross-Sectional Study among Women in Urban Slums Of Bhubaneswar

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Abstract:

Background: Breast cancer is the most common cancer affecting Indian females. Thus, early detection in order to improve the breast cancer outcome and survival remains the cornerstone of breast cancer control. While mammography might be cost-intensive, breast self-examination is feasible and free of cost for screening for early detection of cancer of the breast. This study was conducted to assess the Awareness of BSE and Knowledge, Attitude and Practice of breast self-examination (BSE) and its associated factors. **Material & Meethod :** Study was conducted in selected 13 urban slums of Bhubaneswar which comes under the field practice area of IMS and SUM Hospital in Department of Community Medicine among 300 women aged 18-70 years. **Results:** Among 300 participants, 132 (44%) were aware of BSE. Awareness was significantly associated with education above high school, employment, and age group. Only 1.5% of aware participants reported performing BSE every month, and only 45 of 132 women (34%) had ever practiced BSE. Education above high school was significantly associated with ever practicing BSE and remained significant in multivariable analysis. **Conclusion:** Community-based health education and behavior change communication should focus on improving knowledge of breast cancer, correct BSE technique, and regular practice among women in underserved urban settings.

Introduction:

Breast cancer is the most common cancer among women and remains a major public health concern because delayed diagnosis is associated with poorer outcomes. In low- and middle-income settings, early detection through symptom awareness and timely help-seeking remains essential for reducing morbidity and mortality.(1-3)

Although prevention can reduce risk to some extent, it cannot eliminate most breast cancers. Therefore, early detection continues to be the cornerstone of breast cancer control, particularly in resource-constrained settings.

Breast self-examination (BSE) is a simple, low-cost, and non-invasive method that can improve familiarity with normal breast structure and help women notice abnormalities early. In contexts where organized screening is limited, BSE awareness may support earlier presentation, even though it

does not replace clinical evaluation and mammography.(4-6)

Awareness and practice of BSE remain suboptimal in many settings because of limited knowledge, fear, embarrassment, low perceived risk, and uncertainty regarding the correct technique. These barriers may be more pronounced among women living in underserved urban communities.(7-9)

Evidence from India and other low- and middle-income countries shows wide variation in BSE awareness and practice. Understanding local knowledge, attitudes, and practice patterns is therefore important for planning context-specific health education interventions.(10-14)

However, data from urban slum populations remain limited. The present study was undertaken to assess awareness, knowledge, attitude, practice, and associated socio-demographic factors related to BSE among women residing in urban slums of Bhubaneswar.

Objective:

1. To assess awareness of breast self-examination among women aged 18-70 years residing in selected urban slums of Bhubaneswar.
2. To assess the knowledge, attitude, and practice regarding breast self-examination among women who were aware of BSE.
3. To assess the associated socio-demographic factors influencing awareness of BSE and the knowledge, attitude, and practice scores related to BSE.

Material & Methods:

The study was a community based observational cross-sectional study conducted in 13 urban slums of Bhubaneswar under the field practice area of the Department of Community Medicine, IMS and SUM Hospital, Bhubaneswar, Odisha

Study period was from September 2018 to October 2020. The extended duration was due to phased field visits and interruptions during the COVID-19 period, which affected community access and routine survey activities.

The study population comprised women aged 18-70 years of thirteen slums namely Mangala Vihar, Sabar Sahi-1, Sabar Sahi-2, Sabar Sahi-3/Nuasahi, Godamsahi, Bhoisahi, Chalasahi, Totasahi/ Gudiasahi, Mahavir basti, Baramunda Village, Barabari, Fire station, Sandhasahi in the field practice area of Dept of Community Medicine.

Sample Size: The minimum sample size was estimated using the formula $4pq/d^2$. As the primary outcome was awareness of BSE and a precise local estimate was not available at the planning stage, a conservative prevalence of 50% was considered with 20% relative allowable error. The calculated sample size was 100; however, a larger sample of 300 women was included to improve precision and permit subgroup analyses across the selected slums.

The final sample comprised 300 participants.

Inclusion criteria:

1. Women of age 18 years to 70 years.
2. Only one woman from a house were included

Exclusion criteria:

1. Who were not willing to participate in the study
2. Women who were sick or terminally ill
3. Female who were already diagnosed with breast cancer

Sampling: A list of households in each of the 13 slums was prepared with the assistance of local field records and health workers. The total sample was distributed approximately equally across the slums. Within each slum, households were selected by systematic random sampling using the local

household list as the sampling frame; after a random start, every kth household was approached until the required number was obtained. When more than one eligible woman was present in a household, one participant was selected by simple random method.

Data Collection:

Data were collected by house to house visit by interview method using the pre-designed, pre-tested & semi-structured interview schedule. Informed written consent was obtained. The questions were explained in local language after establishing a good rapport. The data were checked to assess completion of the schedule and accuracy of the data coding. Privacy and confidentiality were maintained. It took around 30-40 minutes for complete data collection of each respondent. In a day maximum 5 participants were interviewed. Field visits were done 1-2 days in a week. If the participant did not have knowledge of breast self-examination they were taught to do individual inspection of their breasts. If any of the participant reported of any morbidity they were advised to visit the UHTC for further management.

Study Tool: A pre-designed pre-tested semi structured interview schedule was used. The schedule was developed from previous studies after an in-depth literature review. Knowledge, Attitude and Practice of Breast self- Examination was developed from previous studies.(15-18) Pre testing of the schedule was conducted on 30 participants to ensure the clarity of data collection and information. The reliability of the study tool was assessed using Cronbach's alpha ($\alpha = 0.76$), which showed good internal consistency. The questionnaire was face validated and content validated from public health experts.

The schedule contained 2 sections. **Section A:** Sociodemographic factors: Data regarding age, religion, caste, family type, number of family members, marital status, education and occupation of participant and head of family, total income of the family was included in this section.

Section B: 1. Awareness of BSE, 2. Knowledge of breast cancer and breast self-examination (BSE), Practice of breast self-examination (BSE) and Attitude towards BSE. The schedule comprised of 28 questions - 10 on knowledge, 11 on attitude, and 7 on practice. Categorical response of TRUE/FALSE/DON'T KNOW was used to answer knowledge based questions and each correct answer was given a score of 1 and a wrong response a score of 0.

A 5-point Likert scale (strongly agree/agree/neutral/disagree/strongly disagree) was used for attitude items. For practice items, the response options were never, seldom, neutral, frequently, and always.

For a positive attitude item, a score of 5, 4, 3, 2 and 1 were used

for strongly agree, agree, neutral, disagree, and strongly disagree, respectively. For practice, an item score of 1, 2, 3, 4, and 5 were given for never, seldom, neutral, frequently, and always, respectively. The score was reversed for all the negative items and the overall score was calculated.

Operational Definitions:

Knowledge, Attitude And Practice Scores:

According to Bloom's Classification cut off points for knowledge score¹⁹

1. Good knowledge: 80-100% correct responses.
2. Satisfactory knowledge: 60-79% correct responses.
3. Poor knowledge: less than 60% correct responses.

Good attitude: Participants who scored points equal to and greater than median of attitude questions.

Poor attitude: Participants who scored point equal to and less than the median of attitude questions.

Good practice score: participants scoring greater than or equal to the median composite practice score. This composite score reflects practice-related behaviors and intentions and should be interpreted separately from the specific outcome of ever performing BSE.

Poor practice score: participants scoring below the median composite practice score.

Mann-Whitney U test, Kruskal-Wallis test, Spearman correlation, and logistic regression analyses were used where applicable.

P value of 0.05 or less was considered as statistically significant.

Statistical Analysis

After data collection, the data were checked for completeness, entered in Microsoft Excel, cleaned, and exported to IBM SPSS Statistics version 26 for analysis.

The categorical variables were expressed in number and percentages. Continuous variables in mean [standard deviation, SD] /median [interquartile range, IQR] and 95% confidence intervals.

Ethical Consideration - Study was approved by the Institutional Ethics Committee of IMS & SUM Hospital, S'O'A University, Bhubaneswar (Ref.no/DMR/IMS.SH/SOA/180122). Informed written consent was obtained from the participants before data collection.

Results:

Awareness Of Breast Self-examination:

Only 44% of the participants (N=300) were aware of Breast self-examination. Univariate binary logistic regression was done to identify factors influencing awareness of breast self-examination among the study participants (n=300). Education above high school [OR 2.083, CI(1.118-3.884), P=0.001], employed [OR 2.470, CI(1.483-4.115), P=0.001], Age 18-45 years [OR 3.179, CI (1.248-8.1), P=0.015], age 46-60 years [OR 4.889, CI(1.747-13.681), P=0.003] were significantly associated with awareness of breast self-examination. Having modifiable or non-modifiable risk factor was not statistically significant with awareness of Breast Self-Examination.

Table 1. Knowledge of Breast Self-Examination (N=132)

S.No.	Knowledge Questions	Correct Response	Wrong Response	Descriptive Statistics
1	BSE should be done every 2 months. Y=1, N=0	67 (72.7%)	36 (27.3%)	
2	What is the best time to do BSE? During menstrual flow (1) A week after period (2) No idea (3)	63 (47.7%)	69 (52.3%)	
3	Lump is the early sign that can be detected by BSE TRUE=1, FALSE=0	67 (50.8%)	65 (49.2%)	
4	Do you know that BSE is a useful tool for early detection of breast cancer? Y=1, N=0	62 (47%)	70 (53%)	

S.No.	Knowledge Questions	Correct Response	Wrong Response	Descriptive Statistics
5	At what age should BSE be started? From birth (1), From puberty (2), From 20 years (3) From 30 years (4) After menopause (5) No idea (6)	43 (32.6%)	89 (67.4%)	Total Score = 10 Mean=6.03 SD=1.47 Median=6 IQR=5-7 Max Score= 9 Minimum score=3 95% CI= 5.8-6.3
6	How often should BSE be done? Daily (1) Weekly (2) Monthly (3) Yearly (4) No idea (5)	75 (56.8%)	57 (43.2%)	
7	What is the best time to do BSE ? During menstrual flow (1), A week after period (2), During pregnancy (3), During breast feeding (4), No idea (5)	44 (33.3%)	88 (66.7%)	
8	BSE should be done by: Doctor (1) Trained Nurse (2) The individual (3) Others (4) (Pls. specify)	100 (75.8%)	32(24.2%)	
9	What should be done if you discover any abnormality during BSE? Pray over it (1) Do some lab. Tests (2) See a doctor (3) Do nothing (4), Others (specify) (5) _____	177 (88.6%)	15 (11.4%)	
10	What are the benefits of BSE? To be familiar with the breast texture (1) Early detection of breast cancer (2) Detection of any abnormal changes in the breast (3) A good breast exercise (4)	129 (97.7%)	3 (2.3%)	

Attitude findings suggested mixed perceptions: many participants did not consider breast examination embarrassing or unpleasant, but fear of breast cancer and low interest in regularly performing or seeking information about BSE were still common (Table 2).

Table 2: Attitude towards breast self-examination (N=132):

S.No.	Question	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)	Descriptive Statistics
1	BSE will/is embarrassing for me	13 (9.8)	45 (34.1)	6 (4.5)	64 (48.5)	4 (3)	
2	BSE is a waste of time	5 (3.8)	37 (28)	32 (24.2)	53 (40.2)	5 (3.8)	
3	Performing BSE will make me feel unpleasant	2 (1.5)	36 (27.3)	23 (17.4)	70 (53)	1 (0.75)	
4	If there is a lump, I prefer to take treatment from a local healer	1 (0.75)	2 (1.5)	10 (7.5)	106 (82.5)	13 (10)	
5	I feel uncomfortable I cannot do BSE	6(4.5)	23(17.4)	33 (25)	60 (45.5)	10 (7.6)	

S.No.	Question	Strongly agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)	Descriptive Statistics
6	All women should do BSE	40 (30.3)	71 (53.8)	10 (7.6)	1 (0.75)	10 (7.6)	Total Score = 55 Mean= 35.6 SD= 4.52 Median=36 IQR= 33 -49 Max Score= 45 Minimum score=25 95% CI= 34.8 - 36.3
7	I really care about my breasts	19 (14.4)	51 (38.6)	21 (15.9)	38 (28.8)	3 (2.3)	
8	I am not afraid to think about breast cancer	2 (1.5)	7 (5.3)	20 (15.2)	90 (68.2)	13 (9.8)	
9	I avoid BSE because I worry about having breast cancer	13 (9.8)	9 (6.8)	13 (9.8)	84 (63.6)	13 (9.8)	
10	I am interested in doing BSE regularly	12 (9.1)	16 (12.1)	38 (28.8)	6 (4.5)	60 (45.5)	
11	Always search for information regarding BSE from the internet, magazine, and newspaper	20 (15.2)	16 (12.1)	40 (30.3)	11 (8.3)	45 (34.1)	

Among participants aware of BSE (n=132), regular practice was poor. Only 1.5% reported monthly BSE, although some respondents reported favorable practice-related attitudes and intentions on the composite scale (Table 3).

Table 3: Practice of breast self-examination (N=132):

S.No.	Practice questions	Never N (%)	Seldom N (%)	Neutral N (%)	Frequently N (%)	Always N (%)	Descriptive Statistics
1	Do BSE once a month	87 (65.9)	30 (22.7)	9 (6.8)	4 (3.03)	2 (1.5)	Total Score = 35 Mean= 14.6 SD= 3.29 Median=14 IQR= 13 -16 Max Score= 26 Minimum score=8 95% CI= 14 - 15.1
2	Avoid learning the correct method of BSE	58 (43.9)	26 (19.7)	10 (7.6)	32 (24.2)	6 (4.5)	
3	Parents or partner always advise to do BSE	122 (92.4)	2 (1.5)	4 (3)	3 (2.3)	1 (0.75)	
4	Advise friends to do BSE	119 (90.2)	4 (3)	7 (5.3)	1 (0.75)	1 (0.75)	
5	Discuss the importance of BSE with friends	118 (89.4)	6 (4.5)	1 (0.75)	4 (3)	3 (2.3)	

S.No.	Practice questions	Never N (%)	Seldom N (%)	Neutral N (%)	Frequently N (%)	Always N (%)	Descriptive Statistics
6	Have been taught on BSE by health staff	88 (66.7)	23 (17.4)	6 (4.5)	4 (3)	11 (8.3)	
7	"If notice any breast abnormality, directly go to public health care"	8 (6.1)	13 (9.8)	3 (2.3)	68 (51.5)	40 (30.3)	

Two-thirds of participants reported that they had never been taught BSE by health staff, and just over half indicated that they would usually seek care at a public health facility if they noticed a breast abnormality (Table 3).

Among those who never practiced BSE, the commonest reason was the absence of perceived breast problems, followed by lack of knowledge about the correct timing and technique (Figure 1).

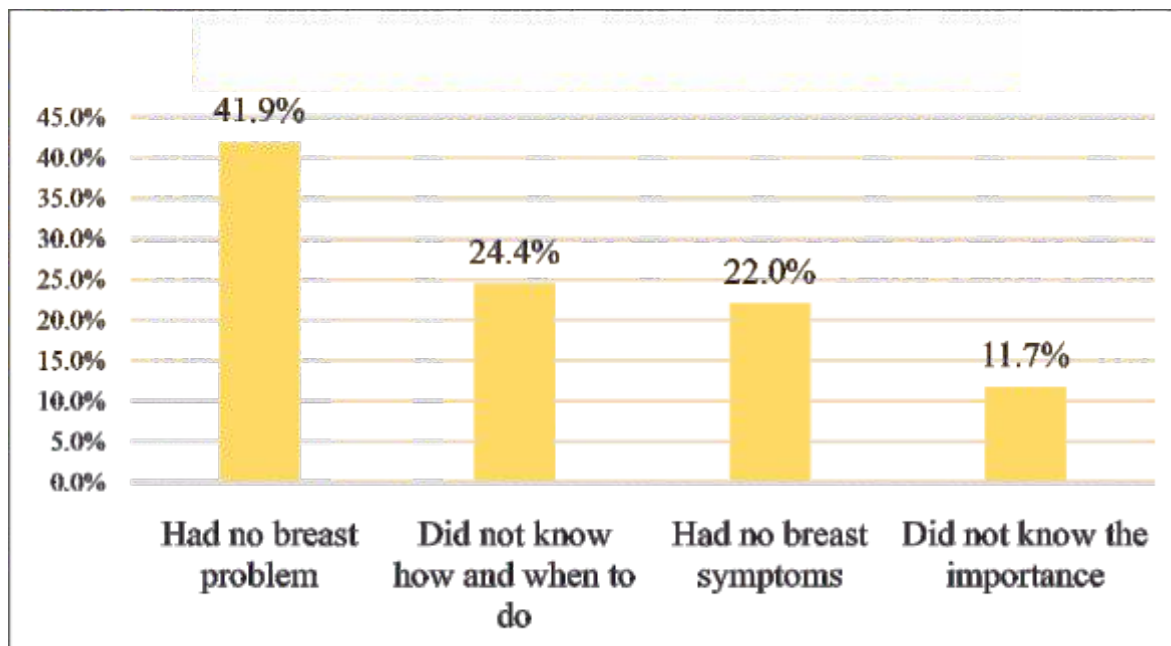


Figure 1. Barriers of BSE among those who were aware of BSE (N=132):

The mean knowledge, attitude, and practice scores were 6.03 ± 1.47 , 35.6 ± 4.52 , and 14.6 ± 3.29 , respectively (Tables 1-3).

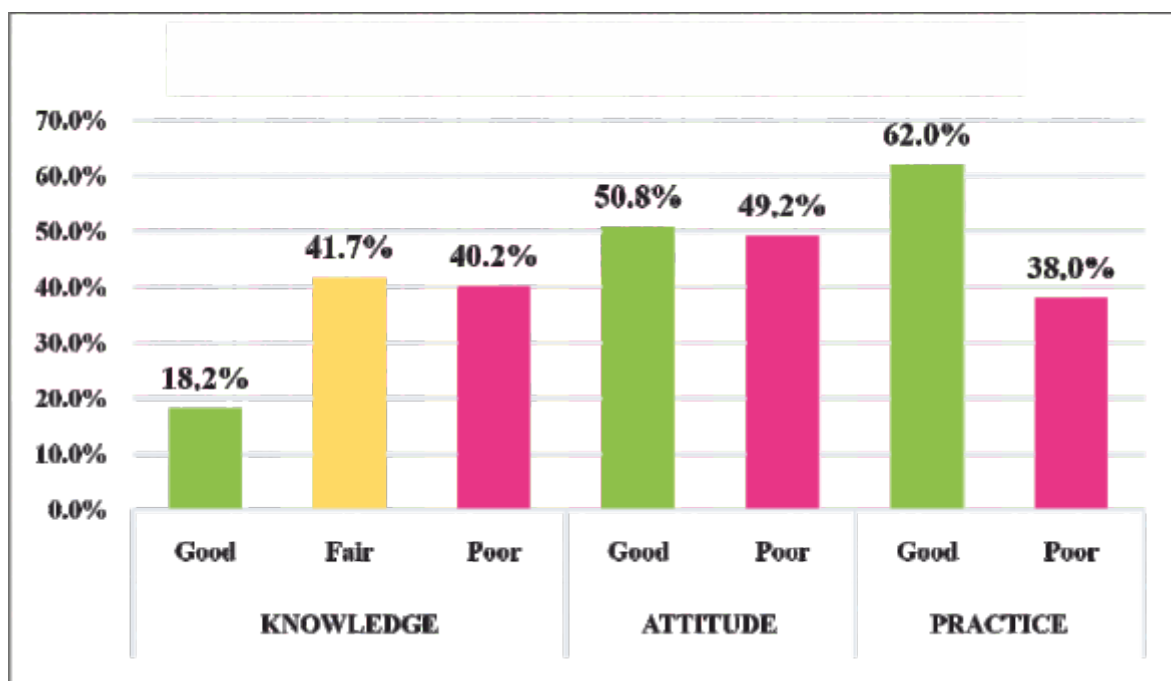


Figure 2. Knowledge, Attitude, Practice Scores

Among the participants knowledge was good in 18.2%, fair 41.7%, poor 40.2%, Attitude was good in 50.8%, poor 49.2% and Practice was good 62.0%, poor 38.0%.(Figure 2)

Knowledge score showed a statistically significant moderate positive correlation with attitude score and weak positive correlations with practice score; attitude and practice scores were also weakly but significantly correlated (Table 4).

Table 4. Correlation of knowledge, attitude and practice scores

Variable	Correlation Coefficient (r - value)	p-value
Knowledge to Attitude Score	0.611	0.000*
Knowledge to Practice Score	0.288	0.001*
Attitude to Practice Score	0.294	0.001*

Spearman rank correlation

*p <0.05 is significant

Table 5. Factors associated with Knowledge, Attitude and Practice Score of Breast self-examination (N=132)

Factors	Total Participants	Median (IQR) of Knowledge	P Value of Knowledge	Median (IQR) of Attitude	P Value of Attitude	Median (IQR) of Practice	P Value of Practice
Age (in years)							
18-45	93(44.3)	6(5-7)	0.747	35(33-39)	0.996	14(14-16)	0.061
45-60	33(55)	6(5-7)		35(32-40)		15(14-16)	
>60	6(20)	5(4-7)		35(33-39)		14(12-16)	
Caste							
General	44(51.8)	6(5-7)	0.171	35(33-39)	0.957	15(13-16)	0.967
Others	88(40.9)	6(5-7)		35(33-39)		14 (13-16)	
Religion							
Hindu	129(44.2)	6(5-7)	0.09	35(33-39)	0.641	15(13-17)	0.688
Muslim	3(37.5)	5(5-6)		34(32-38)		15(13-16)	
Marital status							
Married	127(44.4)	6(5-7)	0.666	36(32-40)	0.843	16(15-19)	0.003*
Unmarried	5(35.7)	6(5-7)		35(33-39)		14(13-16)	
Family Type							
Nuclear	115(47.7)	6(5-7)	0.616	36(32-39)	0.765	14(13-15)	0.024*
Joint	17(28.8)	6(5-7)		35(33-39)		15(13-16)	
Education							
Less than	103(41)	6(5-7)	0.001*	35(32-39)	0.004*	14(13-16)	0.01*
High School							
High school and above	29(59.2)	7(5-8)		37(33-40)		15(14-17)	
Occupation							
Unemployed	80(37.6)	6(5-7)	0.057	35(32-39)	0.029*	14 (13-16)	0.397
Employed	52(59.8)	6(5-7)		36(33-40)		15(13-16)	
Socio-Economic Status							
Middle Class	42(45.7)	6(5-7)	0.556	37(34-40)	0.016*	17(14-16)	0.000*
Lower Class	90(43.3)	6(5-7)		35(32-39)		15(12-15)	
Family History of Breast Cancer							
Yes	3(60)	6(6-8)	0.388	39(34-40)	0.496	16(14-16)	0.021*
No	129(43.7)	6(5-7)		35(33-39)		14(12-16)	

Mann Whitney U test and Kruskal Wallis test

*p<0.05 is significant

Higher education was significantly associated with better knowledge scores (Table 5).

Higher education, employment, and better socioeconomic status were significantly associated with more favorable attitude scores

Practice scores were significantly associated with higher education, better socioeconomic status, marital status, nuclear family type, and family history of breast cancer (Table 5).

Practice of BSE (Ever vs Never):132(44%) were aware of BSE. Among them only 45(34%) ever practiced BSE.

Table 6: Univariate binary logistic regression between various factors and practice of BSE (Ever vs Never)

VARIABLES		Total (N=132)	Ever BSE (N=45)	OR(95%CI)	P-value	AOR	P-value
Education of women	Above high school	29(59.2)	16(55.2)	3.141 (1.344-7.337)	0.008*	2.687 (1.118-6.458)	0.027*
	Below high school	103(41)	29(28.2)	1		1	
Occupation	Employed	52(59.8)	22(42.3)	1.817 (.873-3.782)	0.110	1.603 (0.743-3.461)	0.229
	Unemployed	80(37.6)	23(28.7)	1		1	
SES	Middle	42(45.7)	20(47.6)	2.364 (1.104-5.060)	0.027*	2.002 (0.904-4.434)	0.087
	Lower	90(43.3)	25(27.8)	1		1	

Marital status	Married	127(44.4)	44(34.6)	2.120 (0.230-9.555)	0.507		
	Unmarried	5(35.7)	1(20)	1			
Religion	Hindu	129(44.2)	44(34.1)	1.035 (0.091-11.375)	0.978		
	Muslim	3(37.5)	1(33.1)	1			
Family type	Nuclear	115(47.7)	41(35.7)	1.801 (0.551-5.883)	0.330		
	Joint	17(28.8)	4(23.5)	1			
Family history	Yes	3(60)	2(66.7)	4 (0.353-45.354)	0.02*	3.249 (0.247-42.759)	0.370
	No	129(43.7)	43(33.3)	1		1	
Caste	General	44(51.8)	16(36.4)	1.163 (0.545-2.481)	0.697		
	Others	88(40.9)	29(33)	1			
Age	18-45 years	93(44.3)	38(40.9)	1.382 (.241-7.982)	0.717		
	45-60 years	33(55)	5(15.2)	0.357(.051-2.5)	0.300		
	>60 years	6(20)	2(3.3)	1			
Non-Modifiable Risk Factor	With Risk	43(45.3)	15(34.9)	1.054 (0.490-2.266)	0.894		
	Without Risk	89(43.4)	30(33.7)	1			
Modifiable Risk Factor	With Risk	100(46.7)	36(36)	1.437 (0.652-2.701)	0.413		
	Without Risk	32(37.2)	9(28)	1			

*p<0.05 is significant

In univariate analysis, education, socioeconomic status, and family history of breast cancer were significantly associated with ever practicing BSE. After multivariable adjustment, only education above high school remained a significant predictor (Table 6).

Discussion

Breast self-examination is a simple, low-cost method for early detection of breast tumors. In this study, awareness was higher among women with better education, and education also increased the odds of ever practicing BSE, indicating that breast health literacy is central to both understanding and use of the method.

Only 44% of participants were aware of BSE, which is close to findings from Sikkimese women (45.69%).(20) Similar awareness levels were reported among South Indian women (43.2%).(21) In contrast, higher awareness was reported in other studies, including 97.2%(22) and 64% among students.(23)

Awareness in this study was significantly associated with education, occupation, and age. Education above high school [OR 2.083, CI(1.118-3.884), P=0.001], employment [OR 2.470, CI(1.483-4.115), p=0.001], age 18-45 years [OR 3.179, CI (1.248-

8.1), p=0.015], and age 46-60 years [OR 4.889, CI(1.747-13.681), p=0.003] were all significant. Similar links with education and socioeconomic factors were also reported in Sikkimese women(20) and rural South India.(24)

The low awareness may reflect lower educational status, family responsibilities, and cultural barriers that limit discussion of breast health. Breast cancer is not openly discussed in many Indian settings, which strengthens the need for community- and state-level cancer literacy programs.

In this study, 18.2% had good knowledge, 50.8% had good attitude, and 62% had good practice scores. Similar variation has been seen in studies from rural Tamil Nadu,(25) Karachi,(26) and Malaysia.(27) The positive correlations among knowledge, attitude, and practice in this study are also consistent with findings from Malaysia,(27) Arab American University/Jenin,(16) and other studies, although some reports differ.(28,29)

Education above high school was associated with knowledge score, while attitude score was associated with higher education, employment, and higher socioeconomic class. Similar patterns have been reported among ethnic Kashmiri

females,(30) women in rural central India,(31) and nursing students.(16) These findings suggest that education and social advantage improve both understanding and acceptance of BSE.

Among women aware of BSE, only 34% had ever practiced it. Education, socioeconomic status, and family history were associated with ever practice in univariate analysis, but only education remained significant in multivariate analysis. This agrees with findings from urban women in India(34) and shows that education is the main driver of BSE practice.

Among those who never practiced BSE, the most common reason was absence of breast problems, followed by not knowing how or when to do it, lack of symptoms, and lack of awareness about its importance. Similar barriers were reported among Malaysian female students.(36) Overall, the low practice rate likely reflects poor awareness of screening methods and limited understanding of the value of early detection in this population.

Conclusion

More than half of the participants were not aware of breast self-examination, and regular practice was rare even among women who had heard of BSE. Education was the strongest and most consistent predictor of awareness and ever practice, indicating that breast health literacy is central to improving uptake of this behavior.

Community-based education should therefore focus on breast cancer symptoms, the correct BSE technique, and the importance of timely care-seeking, especially in underserved urban populations. Interventions should be culturally sensitive and should use frontline health workers and community platforms to improve both awareness and skills.

Limitations: The cross-sectional design limits causal inference. The study was conducted in selected urban slums of one city, which may limit generalizability. Self-reported responses are subject to recall and social desirability bias. In addition, the composite practice score should be interpreted cautiously because it reflects practice-related behaviors and intentions and not only actual monthly BSE performance.

Recommendations:

As results show that practice of BSE and knowledge among the women was inadequate, efforts should be made to strengthen community-based health education and social and behavior change communication (SBCC) to increase awareness regarding breast cancer risk factors as well as the practice of breast self-examination.

So, Government as well non-government organisations and media can come forward to promote awareness creation in the community level on breast cancer and breast self-

examination.

Awareness about breast feeding and its protective effects also needs to be imparted to decrease the risk of breast cancer.

Women in late thirties should be the target for the purpose of screening in India as breast cancer is occurring in younger age group in developing countries.

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