

From Awareness to Action: Assessment of Breast Cancer, Self-Examination, and Mammography Knowledge with Subsequent Screening Among Urban Women

Dr. Keerthana C¹, Dr. Sambasivan Venkat², Dr. Ravindra Balaram Gurav³

¹Junior Resident, Department of Community Medicine, Rajiv Gandhi Medical College, Kalwa, Thane - 400605, Maharashtra, India

²Junior Resident, Department of Community Medicine, Rajiv Gandhi Medical College, Kalwa, Thane - 400605, Maharashtra, India

³Professor (Additional), Department of Community Medicine, Rajiv Gandhi Medical College, Kalwa, Thane - 400605, Maharashtra, India

Abstract: ***Background:** The most common cancer among women worldwide is breast cancer. It can be detected at an early stage through self - examination and mammography. This study aimed to assess the awareness of Breast cancer, breast self - examination (BSE) and Mammography among women in an urban area of western Maharashtra. **Materials and Methods:** This was a cross - sectional study conducted in an urban area. The study subjects were women >35 years of age, attending Urban Health Centre OPD. Socio - demographic factors and awareness about Breast cancer and its screening methods was recorded in pre - designed and pre - tested proforma by interviewing them. All the participants are screened for Breast Cancer using Mammography. The data is analysed with the help of suitable statistical methods. **Results:** 34 women were participated in the study.30 (88%) were aware of the disease Breast Cancer.16 (47%) were aware of Breast Self - Examination.8 (23%) were never done Breast Self - examination. Only 32% of women were aware of mammography screening. There is significant association of level of education of women and awareness of breast self - examination and mammography ($p<0.05$). Mammography result of the participants showed 52.9% of women had BIRADS 2 score, 41.1% of women had BIRADS 1 score. **Conclusion:** The knowledge about screening of breast cancer and among women are low. Efforts should be made to increase level of knowledge and practice of BSE and Mammography with the help of health education programs.*

Keywords: Breast Cancer, Awareness, Mammography, Screening, Urban Area

1. Introduction

Breast cancer is the most common malignancy among women worldwide and a leading cause of cancer - related mortality. According to the GLOBOCAN 2020 report, breast cancer accounted for 2.3 million new cases and 685, 000 deaths globally in 2020 [1]. In India, breast cancer has surpassed cervical cancer as the most prevalent cancer among women, with an estimated 178, 361 new cases and 90, 408 deaths reported annually [2]. The increasing incidence of breast cancer in urban areas of India is attributed to factors such as lifestyle changes, delayed childbearing, reduced breastfeeding, and lack of awareness about screening methods [3].

Early detection through breast self - examination (BSE) and mammography has been shown to reduce breast cancer mortality by enabling diagnosis at a potentially curable stage [4]. However, awareness and practice of these screening methods remain suboptimal, particularly in developing countries like India. Studies conducted in India highlight that awareness about breast cancer and its screening methods is low, with only 20–30% of women aware of mammography and an even smaller percentage practicing BSE [5], [6]. The lack of routine screening programs, socioeconomic barriers, and cultural stigma further hinder early detection efforts [7].

The Breast Imaging Reporting and Data System (BIRADS) is a globally standardized tool used to categorize mammographic findings and guide clinical management.

Despite its utility, mammography remains underutilized in India due to low awareness and limited accessibility [8].

Given the burden of breast cancer in India and the critical role of early detection, this study was conducted to assess awareness of breast cancer, BSE, and mammography among women in an urban area of western Maharashtra. Furthermore, all participants underwent mammography screening, and the results were categorized using the BIRADS scoring system. The findings aim to highlight the gaps in awareness and screening practices and provide a basis for targeted health education interventions.

2. Materials and Methods

The present study was a cross - sectional study conducted in an urban area of Western Maharashtra over a period of 2 months - April and May 2022. Women aged more than 35 years attending the Outpatient Department (OPD) of an Urban Health Centre (UHC) were included in the study. Women who were pregnant, previously diagnosed with breast cancer, or unable to provide consent were excluded. A total of 34 participants were recruited using convenience sampling.

Data was collected using a pre - designed and pre - tested structured proforma that captured socio - demographic details such as age, education, occupation, and marital status. Awareness regarding breast cancer, breast self - examination (BSE), and mammography was assessed through direct questions, including “Have you heard of breast cancer?”, “Do

you know how to perform breast self - examination?”, and “Are you aware of mammography as a screening tool for breast cancer?”. Participants were also asked whether they had ever performed BSE or undergone mammography screening.

All participants underwent mammography screening at a designated diagnostic centre, following standard protocols. The mammography results were interpreted by a certified radiologist using the Breast Imaging Reporting and Data System (BIRADS) scoring system. Descriptive statistics were used to summarize socio - demographic details, awareness levels, and mammography findings, while the chi - square test was employed to assess the association between awareness levels and socio - demographic factors, with a p - value of <0.05 considered statistically significant. The study was conducted after obtaining approval from the Institutional Ethics Committee (IEC), and written informed consent was obtained from all participants. Confidentiality was ensured by anonymizing the data, and the study purpose, benefits, and risks were explained to all participants in their preferred language before enrolment.

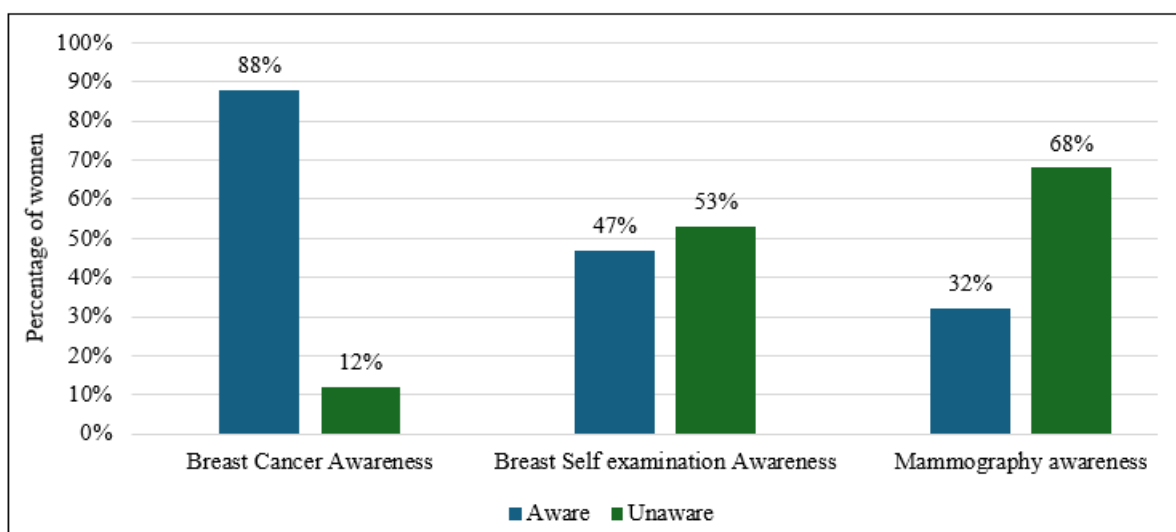
3. Results

The study involved 34 women aged over 35 years, with a mean age of 47.9 years (SD: 6.5). Education levels among the

participants varied, with 29.4% having completed primary education, 23.5% having secondary education, 5.88% having higher secondary education, 14.7% being graduates, and 26.4% being illiterate. The socio - economic status of the participants was assessed using the modified Kuppuswamy scale, where 64.7% were classified under Class IV, indicating a lower socio - economic group. Class III accounted for 23.5%, Class II for 8.8%, and only 2.9% were in Class I, which represents the higher socio - economic status. (Table 1)

Table 1: Socio - Demographic Profile of Study Participants

Variable	n (%)
Mean Age	47.9 ± 6.5
Education	
Primary	9 (29.4%)
Secondary	7 (23.5%)
Higher Secondary	2 (5.88%)
Graduate	5 (14.7%)
Illiterate	8 (26.4%)
Socio - Economic Status (Modified Kuppuswamy Scale)	
Class I	1 (2.9%)
Class II	3 (8.8%)
Class III	8 (23.5%)
Class IV	22 (64.7%)



Graph 1: Breast Cancer, Breast Self - Examination (BSE), and Mammography Awareness among Women

In the study examining awareness levels among women regarding breast cancer and screening methods, significant variations were observed across different parameters. 88% of women demonstrated awareness about breast cancer, while only 12% were unaware of the condition. However, awareness levels were lower for specific screening methodologies. Regarding breast self - examination awareness, with 47% of women being aware and 53% being unaware of this screening technique. In mammography awareness, only 32% of women were aware of this screening tool, 68% remained unaware of mammographic screening. These findings highlight a clear disparity between general breast cancer awareness and specific knowledge about screening methods, suggesting a potential gap in health education regarding breast cancer screening methodologies.

Table 2: Awareness versus Practice of Breast Cancer Screening Methods

Screening Method	Awareness		Practice	
	Aware n (%)	Unaware n (%)	Practice n (%)	No Practice n (%)
Breast Self - Examination	16 (47%)	18 (53%)	11 (32%)	23 (68%)
Mammography	11 (32%)	23 (68%)	7 (20%)	27 (87%)

The study examined both awareness and practice patterns of breast cancer screening methods among women. The results showed that 88% of women were aware of breast cancer, while 12% were unaware. For breast self - examination (BSE), 47% of women reported awareness, but only 32% practiced BSE, showing a 15% difference between awareness and implementation. In the case of mammography, 32% of

women were aware of the procedure, while 20% had undergone mammographic screening, indicating a 12% difference between awareness and practice. The data revealed that 68% of women did not practice BSE, and 80% had never undergone mammography screening. (Table 2)

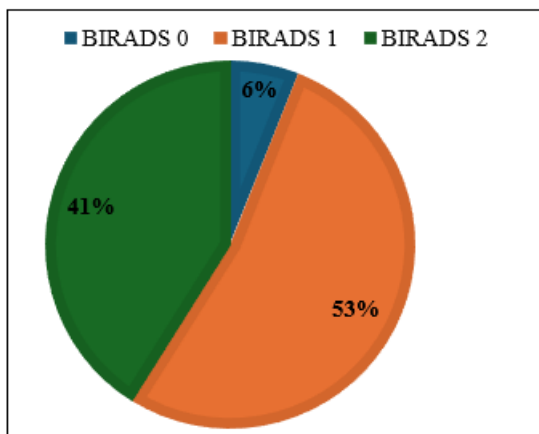
Table 3: Education Level and BSE Awareness

Education	Aware n (%)	Unaware n (%)	Total n (%)
Illiterate	1 (11%)	8 (89%)	9
Literate	15 (60%)	10 (40%)	25
Total	16	18	34

Table 4: Education Level and Mammography Awareness

Education	Aware n (%)	Unaware n (%)	Total n (%)
Illiterate	1 (11%)	8 (89%)	9
Literate	10 (40%)	15 (60%)	25
Total	11	23	34

Fisher's exact test was conducted to examine the association between education level and awareness of breast cancer screening methods, as the sample size was small (N=34). The analysis revealed an association between education level and breast self - examination (BSE) awareness (p=0.018). Similarly, the association between education level and mammography awareness was also observed (p=0.047). In both screening methods, women with literacy demonstrated higher awareness levels compared to illiterate women.



Graph 2: Mammography results of all participants

Score	Category
0	Need additional imaging or prior examinations
1	Negative
2	Benign
3	Probably benign
4	Suspicious
5	Highly suggestive of malignancy
6	Known biopsy - proven

The Breast Imaging - Reporting and Data System (BI - RADS) is a standardized classification system developed by the American College of Radiology (ACR) for reporting mammogram findings. [9] The pie chart illustrates the distribution of BI - RADS (Breast Imaging - Reporting and Data System) scores among the study participants who underwent mammography. The results show that 53% of the women were categorized as BI - RADS 1, indicating negative findings with no abnormalities in the breast tissue. BI - RADS 2, representing benign findings, accounted for 41% of the cases. The remaining 6% of women were classified as BI -

RADS 0, suggesting incomplete assessment requiring additional imaging or prior examinations for complete evaluation. (Graph 2)

4. Discussion

The present study assessed breast cancer awareness and screening practices among urban women in Maharashtra. The findings revealed that 88% of women were aware of breast cancer, which is comparable to studies conducted in other parts of India. Similar results were reported by Kumarasamy et al. (89%) in Tamil Nadu [10] and Khokhar (90%) in Delhi [12], while slightly lower awareness (82%) was noted by Paul et al. in Uttar Pradesh [11].

Despite high breast cancer awareness, knowledge about screening methods was considerably lower. Breast self - examination (BSE) awareness was 47% in our study, which was higher than findings from Tamil Nadu (26%) [10], Delhi (36.1%) [12], and Uttar Pradesh (16%) [11]. This variation might be attributed to differences in study settings, educational status of participants, and exposure to health education programs. [13]

Mammography awareness in our study population was 32%, which was higher than the 16% reported by Paul et al. in Uttar Pradesh [11]. The higher awareness in our study could be due to the urban setting and better access to healthcare information [13].

Our study identified a gap between awareness and practice of screening methods, where only 32% practiced BSE despite 47% being aware of it, and only 20% had undergone mammography despite 32% being aware of the procedure. This finding suggests that awareness alone may not translate into practice, indicating the need for targeted interventions to bridge this gap.

The study also found an association between education level and awareness of screening methods (p<0.05), suggesting that literacy plays a crucial role in understanding and adopting preventive health measures. This emphasizes the need for tailored health education programs considering the literacy levels of the target population [14].

References

- [1] H. Sung, J. Ferlay, R. L. Siegel, et al., "Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries, " *CA: A Cancer Journal for Clinicians*, vol.71, no.3, pp.209–249, 2021.
- [2] Indian Council of Medical Research (ICMR), *Report of National Cancer Registry Programme 2020*, ICMR, New Delhi, 2020.
- [3] S. Malvia, S. A. Bagadi, U. S. Dubey, S. Saxena, "Epidemiology of breast cancer in Indian women, " *Asia - Pacific Journal of Clinical Oncology*, vol.13, no.4, pp.289–295, 2017.
- [4] World Health Organization (WHO), *Global Strategy to Reduce Breast Cancer Mortality*, WHO, Geneva, 2021.
- [5] A. Gupta, P. Tandon, K. Yadav, et al., "Knowledge, attitudes, and practices regarding breast cancer and

- screening methods among women in urban India, " *Indian Journal of Public Health*, vol.66, no.1, pp.56–62, 2022.
- [6] Indian Council of Medical Research (ICMR), *Guidelines for Breast Cancer Screening*, ICMR, New Delhi, 2021.
- [7] K. Deb, S. Agrawal, A. Pratab, T. Meyarivan, "A Fast Elitist Non - dominated Sorting Genetic Algorithm for Multiobjective Optimization: NSGA II, " KanGAL report 200001, Indian Institute of Technology, Kanpur, India, 2000.
- [8] H. H. Crockell, "Specialization and International Competitiveness, " in *Managing the Multinational Subsidiary*, H. Etemad and L. S. Sulude, eds., Croom - Helm, London, 1986.
- [9] D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA. ACR BI - RADS atlas, breast imaging reporting and data system. Reston, VA: American College of Radiology.2013; 2 (3): 4 - 5.
- [10] Kumarasamy H, Veerakumar AM, Subhathra S, Suga Y, Murugaraj R. Determinants of awareness and practice of breast self - examination among rural women in Tamil Nadu, India. *J Cancer Educ*.2017; 32 (2): 264 - 268.
- [11] Paul S, Solanki PP, Shahi UP, Srikrishna S. Epidemiological study on breast cancer awareness and screening practices among women in the urban area of Northern India. *Int J Community Med Public Health*.2015; 2 (4): 482 - 487.
- [12] Khokhar A. Level of awareness regarding breast cancer and its screening amongst Indian teachers. *Asian Pac J Cancer Prev*.2014; 15 (2): 6411 - 6414.
- [13] Gupta A, Shridhar K, Dhillon PK. A review of breast cancer awareness among women in India: Cancer literate or awareness deficit? *Eur J Cancer*.2021; 56 (2): 136 - 149.
- [14] Dey S, Sharma S, Mishra A, Krishnan S, Govil J, Dhillon PK. Breast cancer awareness and prevention behavior among urban women in Delhi, India: Development of a structured intervention program. *J Cancer Educ*.2021; 36 (1): 160 - 168.