

# Perspectives on Mammography: A Survey of Awareness Among Urban Women Across Age Groups

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## ABSTRACT

**Objective:** Breast cancer remains a leading cause of cancer-related morbidity and mortality among women globally. Early detection through mammography significantly improves outcomes; however, awareness and utilization of this screening tool remain inconsistent, especially across different regions of India. This study aimed to assess the level of awareness and knowledge regarding mammography among educated urban women aged 18 to 60 years in Kamrup Metro district, Assam.

**Methods:** A cross-sectional prospective study was conducted from April 2023 to December 2024 among women aged 18 to 60 years residing in urban areas of Kamrup Metro district, Assam. Participants with a minimum educational qualification of graduation were included. Data were collected using a validated, self-structured 10-item questionnaire comprising two sections: socio-demographic details and questions related to awareness, knowledge, and experience of mammography, as well as breast self-examination (BSE) and clinical breast examination (CBE).

**Results:** Out of the total respondents, 85.24% reported having heard of mammography; however, only 7.37% had ever undergone the procedure. Knowledge regarding the purpose, recommended starting age, and frequency of mammography was limited. Only 18% correctly identified the appropriate age to begin screening, and 26.22% were aware that the procedure involves radiation exposure. Awareness of BSE and CBE was also low, reported by just 27.04% of participants. Despite high general awareness, actionable knowledge and screening behavior were lacking. Educational level did not significantly influence awareness between graduates and postgraduates.

**Conclusion:** The study highlights a critical gap between general awareness and actionable knowledge regarding mammography among educated urban women in Northeast India. These findings underscore the need for targeted, region-specific health education strategies focusing on the practical importance of early detection and regular screening practices.

**Keywords:** mammography, awareness, breast cancer, urban women, Kamrup

## INTRODUCTION

Breast cancer is the leading cause of cancer-related deaths among women and the most

often diagnosed malignancy globally. Breast cancer has surpassed lung with 2.3 million cases and 685,000 deaths in the year 2020

and has become the most often diagnosed cancer. It is also the fifth leading cause of deaths related to cancer worldwide. By 2070, it is predicted that there will be 4.4 million cases [1]. In India, female breast cancer (BC) is the leading cause of cancer incidence and mortality, accounting for 13.5% of new cancer cases and 10.0% of cancer-related deaths in 2020 [2]. The North-Eastern region is also known to have a higher frequency of risk factors related to cancer and in addition to having the highest incidence, there are insufficient facilities for cancer treatment [3]. According to studies worldwide, women are aware of breast cancer, mammograms, and breast self-examinations; however, their knowledge of the annual frequency of mammograms, the frequency of BSEs in various age groups, and the associated facts is insufficient. Also, education is widely recognized as a critical factor influencing health awareness, with statistical evidence indicating a positive correlation between higher education levels and increased awareness of mammography. This study seeks to evaluate the level of awareness about mammography among urban women across different age groups and compare these findings with existing literature on uneducated women.

## **MATERIALS & METHODS**

A cross-sectional prospective study was conducted targeting educated women between the ages of 18 to 60 years of age living in urban area in the Kamrup metro district of Assam, India. Graduation was taken to be the minimum level of education. The period of the study was from April 2023 to December 2024.

The survey instrument was a self-structure 10 item self completion questionnaire made in line with the objectives of the study, validated by a panel of experts. The questionnaire consisted of two sections namely demographic status and awareness and knowledge about mammography.

Socio-demographic questions included age, level of education and employment status. The second section tested awareness of

mammography, experience on mammography, knowledge about breast self examination, family history of breast cancer and other related questions.

The first question on section two “Have you heard about mammography?” was used to assess whether the respondents were aware about mammography or not.

One hundred and thirty-seven questionnaires were distributed through hard copy and online form, out of which one hundred twenty-two were duly completed and responded within the period of the study, giving a response rate of 89.05%. Data analysis was done using Microsoft Excel 2010.

Adult women over the age of eighteen and were educated were included in the study. Women below the age of eighteen years and those who refused to participate were excluded from the study.

The women were given a confidential explanation of the goal of the study, and their freedom to withdraw was protected. Before any data was collected, verbal consent was obtained from each respondent.

## **STATISTICAL ANALYSIS**

Data analysis was done using Microsoft Excel 2010 version 10.

## **RESULT**

The study comprised 122 women (whose characteristics are listed in Table 1) who completed the questionnaire and sent it back. Every respondent was either a graduate or a postgraduate.

### **Socio-demographic characteristics of the respondents:**

From a total of 122 respondents, the participants who took part in this study ranged in age from 19 to 66, with a mean age of 42. Majority of the participants in the study were aged between 26-35 years which accounted 59 (48.36%) followed by age greater than 45 years (22.95%). Majority of them were graduates 76 (62.29%) and rest were postgraduates 46 (37.70%).

Variables	Frequency	Percent
<b>Age</b>		
18-25	15	12.29%
26-35	59	48.36%
36-45	20	16.39%
>45	28	22.95%
<b>Level of Education</b>		
Graduate	76	62.29%
Post-graduate	46	37.70%
<b>Employment Status</b>		
Employed	70	57.37%
Unemployed	47	38.52%
Self-employed	5	0.4%
<b>Family history of breast cancer</b>		
Yes	7	5.73%
No	115	94.26%

**Table 1: Demographic characteristics of the respondents (n=122)**

Of the respondents, 70 (57.37%) were employed, 47 (38.52%) were unemployed, and 5 (0.4%) were self-employed. Out of the 122 participants, only 7 (5.73%) have a family history of breast cancer (Table 1).

104 (85.24%) had awareness of mammography while 18 (14.75%) has no awareness and have never heard of mammography. 100 (81.96%) knew that the purpose of mammography is to diagnose breast cancer, while 3 (2.4%) thought that it is used as a treatment, 18 (14.75%)

**Awareness of study participants about mammography:** Most of the respondents,

Variables	Frequency	%
<b>Heard about mammogram</b>		
Yes	104	85.24%
No	18	14.75%
<b>Purpose of mammography</b>		
Diagnosis of breast cancer	100	81.96%
Not sure	18	14.75%
Don't know	1	0.8%
Treatment of breast cancer	3	2.4%
<b>Age of 1st mammogram</b>		
Whenever there is a problem with the breast	69	56.55%
40years and above	22	18%
50 years and above	13	10.62%
Don't know	18	14.75%
<b>Frequency of mammograms</b>		
Once in a year	33	27.04%
Once in 5 years	2	0.16%
Don't know for sure	34	27.88%
Whenever doctor advices	53	43.44%
<b>Side effects of mammogram</b>		
Don't know	80	65.57%
Exposure to radiation	32	26.22%
None	10	0.08%

**Table 2: Awareness on mammography**

were not sure about the purpose and only 1 (0.8%) said they did not know the purpose

of a mammogram. 69 (56.55%) thought that mammography should only be done

whenever there is a problem with the breast, 22 (18%) correctly marked that the age of first mammogram is 40 years and above, while 18 (14.75%) did not know. 53 (43.44%) of the respondents marked that mammography should be done whenever doctor advices them while 33 (27.04%) marked that mammograms should be done

once a year after forty years while 34 (27.88%) said that they don't know it for sure. Out of them, 80 (65.57%) don't know the side effects of mammography, 10 (0.08%) said that there are no side effects while only 32 (26.22%) correctly marked that a side effect of mammogram is exposure to radiation (Table 2).

Variable	Frequency	%
<b>Experience of getting mammogram</b>		
Yes	9	0.07%
No	113	92.62%
<b>If yes, why?</b>		
Recommended by doctor	8	88.88%
Routine check-up	0	0%
Self	1	11.11%
<b>Experience of the procedure</b>		
Emberasing, painful and uncomfortable	6	66.66%
Fine and will advice others too	3	33.33%

**Table 3: Experience of getting a mammogram**

**Experience of mammography:** Only 9 (0.07%) of the total 122 respondents have an experience of getting a mammogram done while 113 (96.62%) have no experience. Out of those 9 respondents who have an experience, 8 (88.88%) did it because their doctor has recommended them for it, 1 (11.11%) went for it as a self check-up and none of them had done it as a routine procedure. Again, regarding the experience of getting a mammogram done, 6 (66.66%) said that their experience was embarrassing, painful and uncomfortable while 3 (33.33%) said that it was fine and can recommend it to others as well (Table 3).

Variable	Frequency	%
<b>Have you heard about BSE and CBE?</b>		
Yes	33	27.04%
No	89	72.95%

**Table 4: Knowledge about BSE and CBE**

**Knowledge about breast self examination and clinical breast examination:** Out of the total 122 respondents, only 33 (27.04%) were aware about breast self examination and clinical breast examination while 89 (72.95%) have never heard about them (Table 4).

## DISCUSSION

This study conducted in the north-east India revealed that while general awareness of mammography among the respondents was relatively high (85.24%), this did not translate into corresponding action, with only 7.37% of participants having ever undergone a mammogram. Furthermore, while both graduates and postgraduates demonstrated high awareness (84.2% and 87%, respectively), this did not result in improved knowledge or practice, indicating that higher education level alone did not significantly influence functional understanding or utilization of mammography. These findings highlight a persistent gap between awareness and actionable knowledge, particularly regarding the purpose, recommended age, and frequency of mammography screening. When compared to other regional and international studies, notable differences emerge. In contrast to the high awareness seen in this study, a study conducted among women with breast cancer in Ethiopia [4] found that only 17% were aware of mammography, and just 14.1% had ever undergone the test—mostly for diagnostic

rather than screening purposes. The higher awareness observed in the current study could be attributed to a more educated study population and potentially better access to health information. However, both studies reported similarly low practice rates, reinforcing the idea that awareness alone is insufficient to prompt screening behavior.

Interestingly, the Ethiopian study showed a strong association between tertiary education and mammography awareness (AOR = 8.1), suggesting that higher education significantly increased awareness in that population. This contrasts with the current findings, where graduates and postgraduates exhibited similar levels of awareness, suggesting a saturation point beyond which education may not further influence awareness, or perhaps pointing to a ceiling effect in urban or better-informed populations.

On the other hand, studies conducted in developed or more urbanized settings reported significantly higher levels of both awareness and practice. For instance, a study in another part of India i.e. Delhi revealed a 99% awareness rate, with 56% of participants correctly identifying what mammography is and 27.3% knowing its purpose. These figures surpass those of the current study in north-east, where only 18% identified the correct age for the first mammogram and 26.22% were aware of its radiation exposure. The Delhi population had a higher proportion of university-educated women (55.5%), which likely contributed to these outcomes. Similarly, a Brazilian study found that 38% of women had undergone mammography screening and 93% demonstrated high levels of knowledge—again underscoring the critical role of both education and health communication systems.

In low-resource settings like Nigeria and Uganda, awareness and practice remain markedly lower. The Nigerian study showed that only 5% of women attending an outpatient clinic had heard of mammography, and none had undergone the procedure. This stark contrast with the

current study suggests geographical and infrastructural disparities in health education and service availability. Notably, in the Ethiopian and Nigerian contexts, mammography was largely unknown prior to diagnosis, indicating limited preventive education and suggesting that health-seeking behavior is often reactive rather than proactive.

The current study also aligns with research from Najran City and Egypt [5], where general awareness and attitudes were found to be inconsistent. In Najran, while awareness was low, participants who were aware had relatively good knowledge and positive attitudes toward screening. Social media and television were cited as the most common sources of health information. This trend is echoed in Egypt, where university outpatient clinic attendees had good general knowledge about breast cancer but limited understanding of its risk factors. Participants expressed willingness to undergo mammography, but life challenges and competing responsibilities often hindered follow-through. This mirrors the present study's finding that knowledge about the screening age and regularity remains insufficient, even among educated women.

Moreover, awareness of breast self-examination (BSE) and clinical breast examination (CBE) was also low in the current study (27.04%), supporting similar findings from other low- and middle-income countries. These low rates of familiarity indicate a broader deficiency in breast health education beyond just mammography, further emphasizing the need for comprehensive awareness campaigns that address all aspects of early detection.

Despite high awareness, the lack of engagement with mammography screening in the current study reflects not just a knowledge deficit but also potential structural and psychological barriers. Factors such as fear, stigma, lack of symptoms, cost, and limited access to screening facilities may discourage preventive screening behavior even among those who are aware. Additionally, a key

limitation of the study is that a portion of the respondents were below the age of forty which is the recommended age to begin routine mammography screening, which may have influenced the low reported uptake of mammograms and the limited knowledge regarding screening guidelines.

## CONCLUSION

The findings from this study, when compared with others across diverse contexts, point to a critical and consistent theme: awareness alone does not lead to action. Even in populations with relatively high levels of education and general awareness, knowledge about the practical aspects of mammography and adherence to recommended screening guidelines remain limited. International comparisons reinforce the importance of targeted health education strategies, access to screening services, and addressing the psychosocial and structural barriers that hinder preventive healthcare engagement.

To bridge the gap between awareness and practice, public health interventions must prioritize actionable knowledge. Mass media campaigns, community-based programs, and integration of breast health education into school curricula and workplace wellness programs can be powerful tools. Health care providers, especially in primary care settings, must also be empowered and trained to provide accurate, culturally sensitive, and proactive counseling about breast cancer screening. By improving both the content and delivery of health education, we can move closer to a population that not only knows about breast cancer screening but actively participates in it leading to earlier detection, reduced mortality and better survival outcomes.

## Declaration by Authors

**Ethical Approval:** Consent and approval were taken from each respondent. Ethical clearance was obtained from The University Research Committee of RGU.

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**Conflict of Interest:** The author declares no conflict of interest.

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