An Assessment of the Impact of Educational Interventions on Breast Cancer Awareness Among Women in Urban Lucknow

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ABSTRACT

Introduction: Breast cancer is the most common cancer affecting women in India, contributing significantly to mortality rates. The late detection of breast cancer, often due to a lack of awareness, makes treatment more challenging. This study aimed to evaluate the impact of an educational intervention on breast cancer awareness among women in an urban setting.
Materials and Methods: A descriptive study with educational interventional involving 423 participants, selected through multistage sampling. A semi-structured questionnaire was used to assess knowledge levels before and after the intervention.
Results: The results showed a substantial improvement (p<.001) in average knowledge scores from pre-test to post-test, suggesting that awareness levels increased following the intervention.
Conclusion: The results suggest that educational programs designed for urban populations can significantly improve breast cancer awareness, thereby potentially facilitating earlier detection among women in Lucknow.

Keywords: Breast, Risk factors, Awareness, Health Education.

INTRODUCTION

Breast cancer (BC) is a non-communicable disease and the most common malignancy affecting women globally. It is one of the leading causes of cancer-related deaths among women, surpassed only by lung cancer. [1].

In 2022, 2.3 million women were diagnosed with breast cancer worldwide, and it resulted in 670,000 deaths. While breast cancer can occur at any age after adolescence, its prevalence increases with age. [2] Epidemiological projections suggest that the global burden of BC could surpass 2 million cases by 2030. According to Globocan data from 2020, breast cancer in India accounted for 13.5% (178,361) of all cancer cases and 10.6% (90,408) of all cancer deaths, with a cumulative risk of 2.81.[3] The incidence of breast cancer in India has been steadily increasing, particularly in urban areas, where

lifestyle factors and access to healthcare services play a significant role. [4]

Symptoms of breast cancer can vary, including mass in the breast or armpit, changes in skin texture, nipple changes, changes in breast size, pain, soreness, or discoloration of the breast. Although the precise cause of breast cancer remains unknown, a number of risk factors have been identified. These include getting older, having a family history of the disease, using contraceptives, eating a high-fat diet, smoking, drinking alcohol, having your first child after the age of 30, stress, early menarche, late menopause, and having larger breasts. However, some risk may be mitigated by practices including breastfeeding, consistent exercise, and sustaining a healthy body weight. [5]

Screening methods like mammography, clinical breast examinations (CBE), and breast self-examinations (BSE) are crucial for early detection. However, in many low-income developing countries, the majority of women present with advanced or metastatic breast cancer when they seek medical attention. [6].

Despite the increasing burden of breast cancer, awareness of risk factors, screening methods, and the importance of early detection remains inadequate among women in many urban communities, including Lucknow. Tailored educational interventions have shown promise in closing this knowledge gap by providing accurate information, dispelling myths, and empowering women to take proactive steps for their breast health. [7]

Although a few studies have explored the impact of breast cancer health education on urban females in Lucknow, this study aims to further evaluate the effectiveness of such interventions in raising knowledge of breast cancer among this population.

MATERIALS & METHODS
Study area
The field practice of urban health training centre, Sarvodaya Nagar under the department of Community Medicine, IIMSR, Lucknow.

Study population
Women between the age of 18-60 years.

Study design and study period
A descriptive study with educational intervention for the period of two years.

Sample size and sampling technique
The optimum sample size for the study was calculated using a following formula:

$$\text{Sample size (n)} = \frac{Z^2 p(1-p)}{d^2}$$

Taking into consideration of p value as 51.7%[8], Z as 1.96 (95% CI) and d as 5%, the sample size was found to be 384. Considering 10% non-responsive, the final sample size was found to be 423.

A multistage stratified random sampling technique was adopted to select the sample for the study. The area of Sarvodaya Nagar has 8 blocks (A-H). At the first stage, four blocks were selected by using systematic random sampling i.e. every second block. At the second stage, households were calculated by probability proportional to size from each block. At the third stage, from each household, one female participant was selected randomly. Hence, the total sample size for my study is 423.

Data for the study was collected using pretested & predesigned semi structured questionnaire after obtaining written informed consent. The pre-test was performed followed by health talk. After three months of the health talk, post-test was conducted with a same questionnaire.

Inclusion criteria
All women between the age of 18-60 years in the study area and who gave consent to participate.

Exclusion criteria
All those women already diagnosed with breast cancer and under treatment.

STATISTICAL ANALYSIS

Data of pre-test and post-test questionnaire were analysed using SPSS evaluation version 22. Socio-demographic variables and outcome variables were described in terms of frequency, percentages, mean and standard deviation. Chi square test was used to test association between the knowledge and sociodemographic variables. McNemar's test used to compare pre-test and post-test qualitative data. A P-value of less than 0.05 was considered to be significant.

RESULTS

Altogether 423 females were participated in this study. The majority of the participants were aged between 18 to 40 and were married. The mean age of the study participants was 30.28 ± 9.4 years. More than half of the study participants (66.9%) were educated. In terms of religion, Hinduism was predominant among the participants, constituting 91.7% of the sample. Socio-economic status with a significant portion belonging to the middle class (46.8%), followed by upper and lower-class segments (table 1)

Table 1: Socio-demographic data of participants (n=423)

Age	Frequency	Percent (%)
18-27	188	44.4
28-37	165	39.0
38-47	33	7.8
48-57	25	5.9
Above 57	12	2.8
Marital status		
Married	370	87.5
Unmarried	30	7.1
Widow	23	5.4
Religion		
Hindu	388	91.7
Muslim	23	5.4
Christian	12	2.8
Educational status		
Primary or less	141	33.3
Above	283	66.9
SES		
Lower Class	102	24.1
Middle Class	198	46.8
Upper Class	123	29.1

Knowledge of breast cancer

The results in the table 2 shows the percentage of right answer responded by the participants regarding risk factor of breast cancer. 33% participants responded that not breastfeeding a child could cause breast cancer, 14.7% answered that alcohol consumption could be a risk factor and 35.4% were unaware of the risk factors of breast cancer. Risk factors such as family history, obesity, age and oral contraceptive use were responded by less than 20%. It can be concluded that non-breastfeeding behaviour and alcohol consumption are the main risk factors.

Table 2: Knowledge of risk factors of breast cancer (n=423)

Risk factors of Breast cancer (n=423)	Frequency	Percent (%)
Family history of breast cancer	29	6.8
Age	8	1.8
Drinking alcohol	62	14.7
Obesity	22	5.2
OCP use	12	2.8
Not breastfed	140	33.0
Do not know	150	35.4

Regarding sign and symptoms of breast cancer 43% respondent did not know the sign and symptoms whereas 28% respondents answered pain in the breast region as the symptoms for breast cancer. It was followed in descending order by 25% painless lump and only 4% answered change in breast shape as shown in figure1.
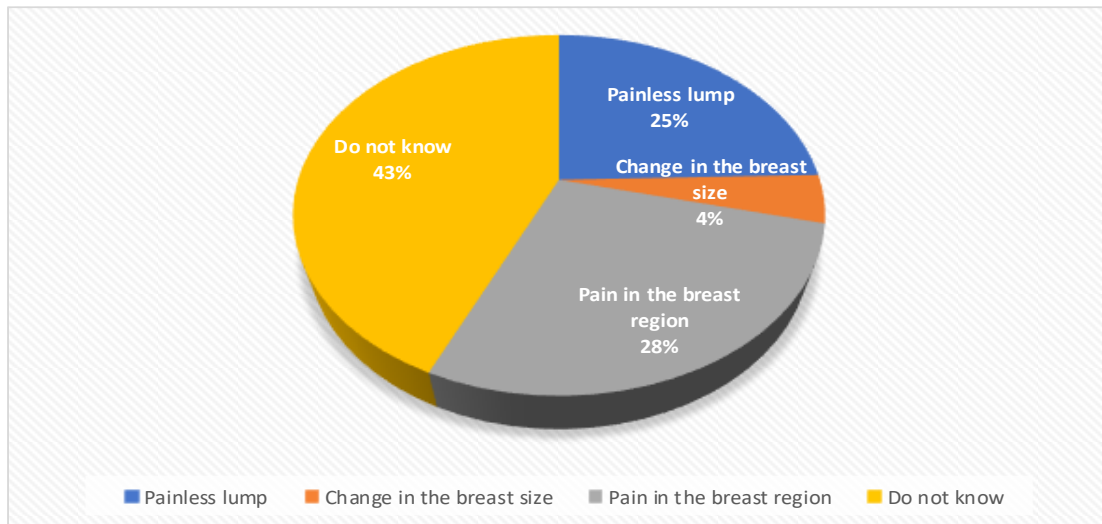

Figure 1: Sign and symptoms of breast cancer(n=423)

The results indicated that 35% of respondents knew that breastfeeding, whereas 22% less alcohol consumption, lowers the risk of breast cancer and 3% responded that hormonal replacement therapy should be avoided. However, 40% respondents had lack of knowledge about the methods of protection. (figure 2) Only 54.84% of respondents had heard of breast cancer, and 45.62% understood that breast cancer is not a communicable disease. A mere 8.03% had a family history of breast cancer. Meanwhile, 64.1% recognized that breast cancer can be detected early, and 70.7% believed that early detection enhances survival chances. 78.48% did not know the method to detect breast cancer at early stage. (table 4) However, just 1.89% of participants were aware of breast self-examination, with poor level of knowledge about the correct frequency for performing it.
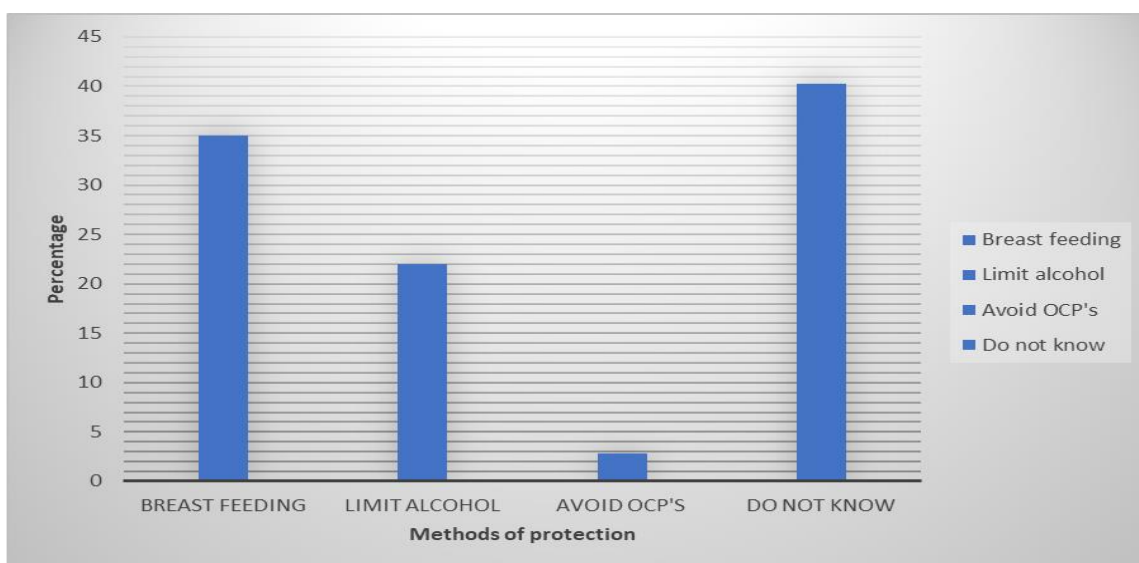

Figure 2: Proportion of participants with knowledge about various methods of protection of breast cancer (n=423)

Table 3 demonstrates a statistically significant association between age and breast cancer knowledge (χ^2 = 20.68, p <0.01). Participants aged 18-35 showed higher knowledge scores compared to those aged 36-60. Marital status was also significantly associated with breast cancer knowledge (χ^2 = 31.6, p < 0.01), with married participants scoring higher than those who were unmarried or widowed. No significant relationship was found between religion and breast cancer knowledge (χ^2 = 2.79, p = 0.592). However, a significant correlation was observed between educational level and knowledge of breast cancer (χ^2 = 7.49, p = 0.024), where individuals with primary education or lower had lower knowledge scores compared to those with higher educational attainment. Additionally, socioeconomic status (SES) was significantly linked to breast cancer knowledge (χ^2 = 33.36, p < 0.01), with participants from lower socioeconomic backgrounds scoring lower compared to those from middle or upper socioeconomic groups.

Table 3: Association between sociodemographic factors and knowledge towards BC (n=423)

Age	Knowledge of breast cancer			Total	p-value
	Poor (≤4)	Good (5-7)	Very good (8-10)		
18-35	150	185	17	352	< 0.01
36-60	11	58	2	71	
Marital status					
Married	134	217	19	370	< 0.01
Unmarried	24	6	0	30	
Widow	3	20	0	23	
Religion					
Hindu	149	222	17	388	0.592
Muslim	10	12	1	23	
Others	2	9	1	12	
Educational status					
Primary or less	65	66	10	141	0.024
Above	106	167	9	282	
SES					
LC	58	41	3	102	< 0.01
MC	77	109	12	198	
UC	26	93	4	123	

Significant improvements in correct responses were observed post-intervention regarding risk factors, particularly in awareness of family history of breast cancer (from 6.8% to 9.9%, p <0.01) and identifying a painless lump as a symptom (from 24.5% to 26.7%, p < 0.01). There were also notable gains in recognizing early detection methods, with increased correct responses related to identifying signs and symptoms (from 8.03% to 9.6%, p < 0.01) and understanding risk factor groups and the importance of regular screening (from 10.16% to 14.1%, p < 0.01). Awareness of protective measures, such as breastfeeding, also saw a significant increase in correct responses (from 35.0% to 40.8%, p < 0.01). Additionally, there were positive shifts in participants' perceptions, with more individuals recognizing that breast cancer is curable (from 45.8% to 55.5%, p < 0.01), can be detected early (from 64.1% to 73%, p <0.01), and that early detection improves survival rates (from 70.7% to 82.5%, p <0.01), as shown in Table 4. These results underscore the effectiveness of the intervention in enhancing participants' knowledge and understanding of breast cancer-related factors and behaviors.

Table 4: Comparison of correct knowledge status of the participants at their pre and post intervention status (n=423)

	Pre-test (%)	Post-test (%)	P-value
Knowledge of risk factors	273 (64.5%)	313 (73.9%)	<0.01
Knowledge of sign and symptoms	240 (56.7%)	265 (62.6%)	<0.01
Knowledge of methods to detect breast cancer early	91 (21.5%)	129 (30.4%)	<0.01
Knowledge of methods of protection	251 (10.9%)	289 (68,3%)	<0.01
Breast cancer is curable	192 (45.8%)	235 (55.5%)	<0.01
Breast cancer can detect early	271 (64.1%)	310 (73%)	<0.01
Early detection can improve survival	299 (70.7%)	349 (82.5%)	<0.01

*McNemar's test

The findings show the overall mean knowledge score for pre-test was 3.98 out of a maximum score of 10, which is equal to 39.8%. It can be concluded that the knowledge score of participants before the awareness programme was at poor level. However, post-program implementation, there was a substantial improvement observed, with the mean knowledge score rising to 6.02. (figure 3).
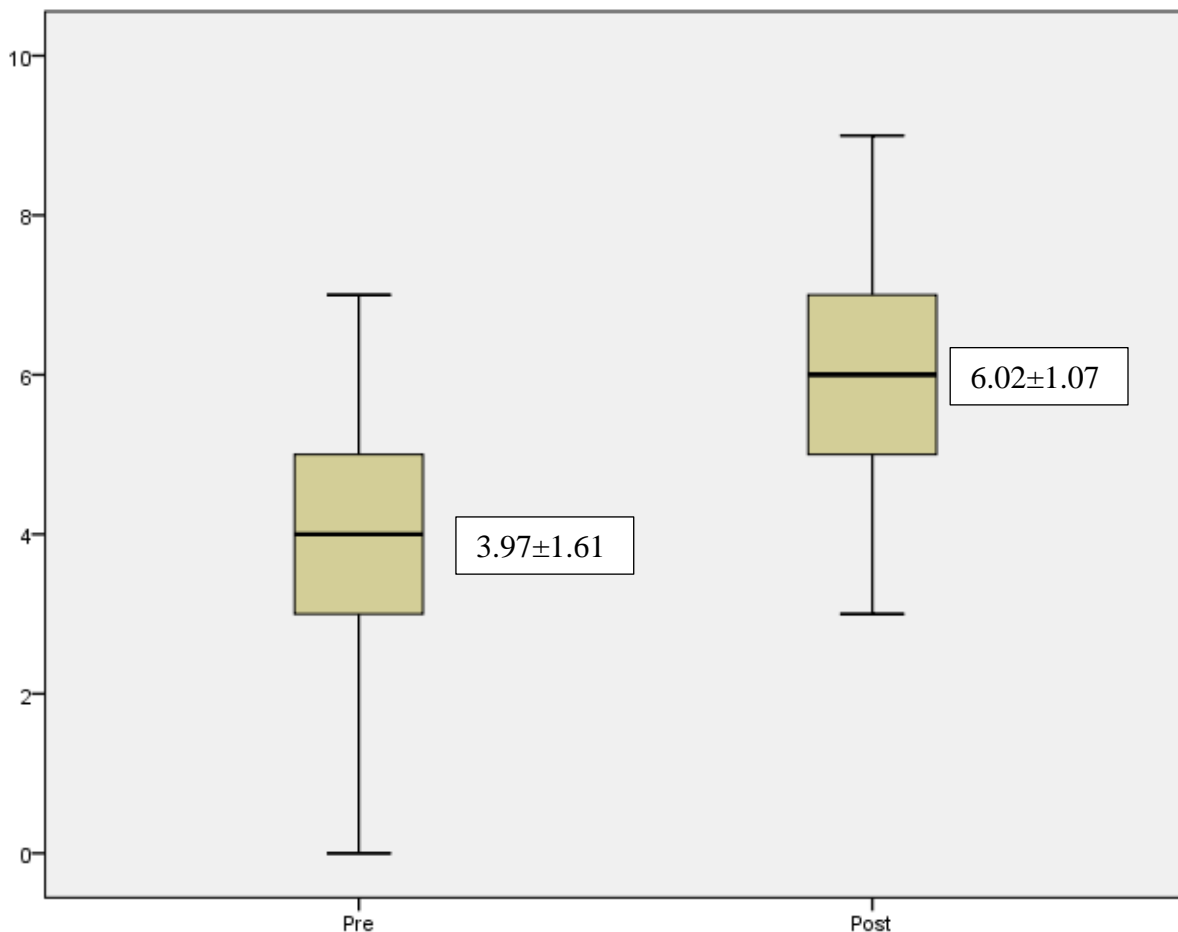

Figure 3: Comparison of mean knowledge score of pre and post intervention

DISCUSSION

Raising awareness about breast cancer among women is crucial for early detection of its signs and symptoms, which can lead to a reduction in breast cancer-related mortality. A lack of knowledge is a significant factor contributing to the rising number of deaths from breast cancer worldwide.

In this study, 423 participants were evaluated for their awareness of breast cancer. The average age of the participants was 30.28 ± 9.4 years, indicating a predominantly young

demographic, with 83.1% of participants being under 38 years old. Similar studies, such as those by Pillay et al [9] and Okubia et al.[10], found mean ages of 35.23 and 29.13 ± 10.50 years, respectively. In contrast, Gupta et al. [11] reported a higher mean age of 46 ± 4.5 years in their study.

Regarding marital status, the majority of participants (87.4%) were married, aligning with the findings of Rao et al. [12], where approximately 70% of individuals were married. This is in contrast to the study by Gupta et al. [11], where only 33% of the female participants were married, with the remainder being unmarried.

In terms of religious affiliation, 91.7% of the participants in this study were Hindu, a figure comparable to the 89% reported by Gangane et al.[13] Similarly, Harshal et al.[14] found that 79.5% of their study population were Hindu. Additionally, 66.9% of the participants in this study had education levels beyond primary school, which is similar to findings by Prachi et al. [15]

The study showed a significant increase in the participants' knowledge following the breast cancer awareness program. Initially, the mean knowledge score was 3.97 out of 10, reflecting limited understanding of breast cancer-related concepts. However, after the intervention, the mean score increased to 6.02, an improvement of 2.05 points, which is statistically significant ($p < 0.01$). The overall knowledge level was initially poor (less than 40%), consistent with findings from earlier studies by Ewaid et al. [16], Yerpude et al. [17], and Okubia et al. [10]

Overall, the findings highlight the effectiveness of the awareness program in enhancing knowledge and encouraging proactive practices related to breast cancer prevention and early detection. These results suggest that continuing to develop and implement targeted educational initiatives could sustain and amplify the positive outcomes in breast cancer awareness.

CONCLUSION

This study demonstrates the positive impact of health education on enhancing knowledge about early breast cancer detection among women in urban areas. The findings revealed a significant improvement in participants' understanding following the awareness program, particularly regarding early detection practices.

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