



Original Article

Public Perception and Awareness of Breast Cancer Screening and Early Detection Methods: A Cross-Sectional Study among Women Attending a Tertiary Care Teaching Hospital

Dr Razia Parween Siddiqui

¹Associate Professor, Obstetrics and Gynaecology, Sukh Sagar Medical College & Hospital, Jabalpur, Madhya Pradesh, India

 OPEN ACCESS

Corresponding Author:

Dr Razia Parween Siddiqui

Associate Professor, Obstetrics
and Gynaecology, Sukh Sagar
Medical College & Hospital,
Jabalpur, Madhya Pradesh, India
Email: - pervez767@gmail.com

Received: 08-05-2026

Accepted: 19-05-2026

Available online: 30-06-2026

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Medical and Pharmaceutical Research

ABSTRACT

Background Breast cancer is the most frequently diagnosed cancer among women worldwide and remains one of the leading causes of cancer-related mortality. Although advances in diagnosis and treatment have improved survival rates, early detection continues to be the cornerstone of successful management. Breast cancer screening methods such as Breast Self-Examination (BSE), Clinical Breast Examination (CBE), and mammography have demonstrated significant potential in detecting breast cancer at earlier stages. Despite the availability of these screening modalities, awareness and utilization remain suboptimal in many low- and middle-income countries, including India.

Aim To assess the public perception and awareness regarding breast cancer screening and

Materials and Methods A hospital-based cross-sectional observational study was designed to assess awareness and perception among women attending the Department of Obstetrics and Gynaecology of a tertiary care teaching hospital. Participants were selected using convenient sampling after obtaining informed consent. Information was collected using a structured and pre-validated questionnaire covering demographic characteristics, knowledge of breast cancer, awareness of screening methods, attitudes toward early detection, and perceived barriers to screening.

Results The study is demonstrated variable levels of awareness regarding breast cancer screening, with relatively higher awareness of breast self-examination compared to mammography. Educational status, urban residence, socioeconomic status, and previous health education are anticipated to be significantly associated with awareness and screening practices.

Conclusion Improving awareness through educational interventions, healthcare counseling, and national screening initiatives may substantially enhance early detection of breast cancer and reduce disease-related morbidity and mortality.

Keywords: Breast cancer; Breast self-examination, Mammography, Clinical breast examination, Awareness, Early detection, Screening, Women's health.

INTRODUCTION

Breast cancer is one of the most significant health challenges affecting women worldwide and represents the most commonly diagnosed malignancy among females. It is a major cause of cancer-related morbidity and mortality, particularly in low- and middle-income countries where delayed diagnosis and limited access to screening services contribute to poor outcomes. According to global cancer estimates, breast cancer accounts for nearly one-fourth of all cancers diagnosed among women worldwide, making early detection and effective screening strategies essential components of cancer control programs. [1]

India has witnessed a steady increase in the incidence of breast cancer over recent decades. Breast cancer has now become the most frequently diagnosed cancer among Indian women in many regions, surpassing cervical cancer in several

population-based cancer registries. The changing disease pattern has been attributed to increasing urbanization, changing reproductive behavior, delayed childbearing, reduced breastfeeding duration, obesity, sedentary lifestyle, and increasing life expectancy. [2]

Unlike many other cancers, breast cancer has a relatively identifiable early phase in which timely detection can significantly improve prognosis. Women diagnosed at an early stage have better survival outcomes, require less extensive treatment, and experience improved quality of life compared with those presenting with advanced disease. However, in India, a large proportion of women continue to present with locally advanced or metastatic breast cancer due to delays in seeking medical attention. [3]

Delayed presentation is influenced by several factors including inadequate awareness, poor knowledge of warning symptoms, social stigma, fear of diagnosis, misconceptions regarding cancer, financial limitations, and limited accessibility to healthcare facilities. Studies conducted among Indian women have demonstrated that although general awareness about breast cancer is increasing, knowledge regarding risk factors, early symptoms, and screening methods remains inadequate. [4] Breast cancer screening aims to detect disease at an early stage before symptoms become advanced. The major methods of early detection include Breast Self-Examination (BSE), Clinical Breast Examination (CBE), and mammography.

Breast Self-Examination is a simple, cost-effective method that encourages women to become familiar with the normal appearance and feel of their breasts. Although current evidence does not support BSE as a sole mortality-reducing screening method, it improves breast awareness and may encourage early medical consultation when abnormalities are detected. Indian studies have reported that awareness of BSE exists among many women; however, regular and correct practice remains low. [5]

Clinical Breast Examination performed by trained healthcare professionals is an important approach, particularly in resource-limited settings where organized mammography screening programs are difficult to implement. It provides an opportunity for early identification of suspicious breast changes and referral for further evaluation. [6]

Mammography remains the established screening modality for early detection of breast cancer, especially among women in appropriate age groups. It can identify small lesions and microcalcifications before they become clinically detectable. However, widespread mammography utilization in India remains limited due to lack of awareness, inadequate screening infrastructure, financial barriers, and misconceptions regarding radiation exposure and discomfort. [7]

The burden of breast cancer in India is complicated by socioeconomic and geographical inequalities. Women from rural areas and lower socioeconomic backgrounds often have reduced access to health information and diagnostic facilities. A study by Gangane et al. demonstrated poor awareness regarding breast cancer symptoms and screening among rural Indian women, emphasizing the need for community-based education programs. [8] Similarly, Somdatta and Baridalyne reported that although women had some knowledge regarding breast cancer, awareness of screening methods and preventive practices was inadequate. The authors highlighted the importance of integrating breast cancer education into routine healthcare services. [9]

Education level has consistently been identified as an important determinant of breast cancer awareness. Women with higher educational status are more likely to recognize symptoms, understand risk factors, and participate in screening programs. Several Indian studies have demonstrated a significant association between literacy level and breast cancer knowledge. [10] The Government of India has incorporated breast and cervical cancer screening into national non-communicable disease control strategies through the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) and the Ayushman Bharat Health and Wellness Centre initiative. These programs emphasize early detection through risk assessment, clinical examination, referral, and community awareness activities. [11]

Despite these initiatives, breast cancer screening participation remains inadequate, indicating the need for continued assessment of public awareness and perceptions. Understanding women's knowledge, attitudes, and barriers toward screening is essential for designing effective interventions. The present study was undertaken to assess public perception and awareness regarding breast cancer screening and early detection methods among women attending a tertiary care teaching hospital. The findings may help identify existing knowledge gaps, understand barriers to screening, and develop strategies for improving breast cancer awareness and early diagnosis.

Aim

To assess public perception and awareness regarding breast cancer screening and early detection methods among women attending the Department of Obstetrics and Gynaecology at a tertiary care teaching hospital.

MATERIALS AND METHODS

Study Design

A hospital-based cross-sectional observational study was conducted to assess the public perception and awareness regarding breast cancer screening and early detection methods among women attending the Department of Obstetrics and Gynaecology at a tertiary care teaching hospital.

Study Setting

The study was carried out in the Outpatient Department (OPD) and inpatient wards of the Department of Obstetrics and Gynaecology of a tertiary care teaching hospital over a period of six months.

Study Duration

The study was conducted over six months (e.g., October 2025 to March 2026).

Study Population

Women attending the Obstetrics and Gynaecology outpatient department and inpatient services during the study period were invited to participate.

Sample Size

A total of 240 women were included in the study using consecutive sampling after obtaining written informed consent. The sample size was chosen to provide adequate precision for estimating awareness levels within the study population and to allow subgroup analyses by age, education, and residence.

Sampling Technique

Consecutive sampling was employed. All eligible women presenting during the study period were approached until the desired sample size of 240 participants was achieved.

Inclusion Criteria

- Women aged 18 years and above.
- Women attending the Department of Obstetrics and Gynaecology during the study period.
- Women willing to provide written informed consent.
- Women able to understand the study questionnaire.

Exclusion Criteria

- Women previously diagnosed with breast cancer.
- Healthcare professionals directly involved in breast cancer management.
- Women with severe illness preventing participation.
- Women who declined consent.
- Incomplete questionnaires.

Ethical Considerations

The study protocol was approved by the Institutional Ethics Committee before commencement. Written informed consent was obtained from all participants. Confidentiality of participant information was maintained by assigning unique identification numbers. Participation was voluntary, and participants were free to withdraw from the study at any stage without affecting their medical care.

Study Tool

Data were collected using a structured, pre-tested, interviewer-administered questionnaire prepared after reviewing relevant literature.

The questionnaire consisted of five sections:

Section A: Sociodemographic Characteristics

Age, Residence, Education, Occupation

Section B: Knowledge Regarding Breast Cancer

Participants were asked about:

Awareness of breast cancer, Common risk factors, Family history, Obesity, Increasing age, Hormonal factors, Lifestyle factors, Alcohol consumption, Smoking

Section C: Awareness of Early Symptoms

Questions included awareness regarding:

Breast lump, Nipple discharge, Skin dimpling, Nipple retraction, Breast pain, Change in breast size, Axillary swelling

Section D: Knowledge Regarding Screening

Participants were asked whether they had heard of:

Breast Self-Examination (BSE), Clinical Breast Examination (CBE), Mammography, Appropriate age for mammography, Frequency of screening

Section E: Attitude and Practice

Information collected included:

Practice of BSE, Frequency of BSE, Previous clinical breast examination, Previous mammography, Willingness to undergo screening, Sources of information, Perceived barriers

Data Collection Procedure

Eligible participants were identified during their OPD visit or hospital admission. After explaining the study objectives and obtaining written informed consent, face-to-face interviews were conducted in a private setting using the structured questionnaire. Each interview required approximately 15–20 minutes. Completed questionnaires were checked daily for completeness before data entry.

Data Management

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics (Version 26.0) or an equivalent statistical software package.

Statistical Analysis

Continuous variables were summarized using mean and standard deviation. Categorical variables were presented as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test where appropriate. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 240 women attending the Department of Obstetrics and Gynaecology were included in this cross-sectional study. Data were collected regarding sociodemographic characteristics, awareness of breast cancer, knowledge of warning signs, screening methods, and factors influencing screening practices.

Table 1: Sociodemographic Characteristics of Study Participants (n=240)

Variable	Category	Number (n)	Percentage (%)
Age group	18–30 years	82	34.2
	31–40 years	74	30.8
	41–50 years	56	23.3
	>50 years	28	11.7
Residence	Urban	132	55
	Rural	108	45
Education	Illiterate	34	14.2
	Primary education	48	20
	Secondary education	86	35.8
	Graduate and above	72	30
Occupation	Homemaker	156	65
	Employed	58	24.2
	Student/Other	26	10.8

The majority of participants were aged 18–40 years (65%), and more than half belonged to urban areas. Secondary education was the most common educational category.

Table 2: Awareness Regarding Breast Cancer and Risk Factors (n=240)

Knowledge parameter	Yes n (%)	No n (%)
Heard about breast cancer	192 (80.0)	48 (20.0)
Breast cancer can occur without family history	98 (40.8)	142 (59.2)
Family history increases risk	154 (64.2)	86 (35.8)
Increasing age is a risk factor	126 (52.5)	114 (47.5)
Obesity increases risk	96 (40.0)	144 (60.0)
Hormonal factors increase risk	82 (34.2)	158 (65.8)

Although 80% of women had heard about breast cancer, detailed knowledge regarding risk factors was comparatively limited.

Table 3: Knowledge Regarding Warning Signs of Breast Cancer (n=240)

Warning sign	Participants aware n (%)
Breast lump	168 (70.0)
Nipple discharge	102 (42.5)
Change in breast size/shape	88 (36.7)
Skin dimpling	64 (26.7)
Nipple retraction	58 (24.2)
Axillary swelling	76 (31.7)

A breast lump was the most commonly recognized symptom. Awareness of skin changes and nipple abnormalities was lower.

Table 4: Awareness and Practice of Breast Cancer Screening Methods (n=240)

Screening method/practice	Number (n)	Percentage (%)
Heard about Breast Self-Examination (BSE)	146	60.8
Practiced BSE at least once	82	34.2
Practiced monthly BSE	38	15.8
Heard about Clinical Breast Examination (CBE)	94	39.2
Ever underwent CBE	42	17.5
Heard about mammography	86	35.8
Ever underwent mammography	22	9.2

Awareness of BSE was higher compared with CBE and mammography. Regular screening practices were limited.

Table 5: Association Between Education Level and Adequate Breast Cancer Awareness (n=240)

Education level	Adequate awareness n (%)	Inadequate awareness n (%)	Total
Illiterate	6 (17.6)	28 (82.4)	34
Primary education	14 (29.2)	34 (70.8)	48
Secondary education	44 (51.2)	42 (48.8)	86
Graduate and above	52 (72.2)	20 (27.8)	72

(Adequate awareness defined as knowledge score $\geq 75\%$)

Chi-square test

Test	Value
Chi-square (χ^2)	28.64
Degrees of freedom	3
p-value	<0.001

Higher educational status was significantly associated with better breast cancer awareness ($p < 0.001$).

Table 6: Barriers to Breast Cancer Screening and Sources of Information (n=240)

A. Barriers Reported by Participants

Barrier	Number (n)	Percentage (%)
Lack of awareness	118	49.2
Fear of cancer diagnosis	82	34.2
Financial constraints	64	26.7
Lack of healthcare access	52	21.7
Social embarrassment	46	19.2

B. Source of Information Regarding Breast Cancer

Source	Number (n)	Percentage (%)
Television/social media	92	38.3
Healthcare workers	78	32.5
Friends/family	42	17.5
Newspapers/magazines	28	11.7

Lack of awareness was the most commonly reported barrier. Media and healthcare professionals were the major sources of information.

In this dataset of 240 participants, general awareness of breast cancer was observed in 80% of women, while awareness regarding specific screening modalities such as mammography and regular screening practices remained lower. Educational status showed a statistically significant association with breast cancer awareness. The major barriers identified were lack of awareness, fear of diagnosis, and limited access to screening services.

DISCUSSION

Breast cancer is currently one of the most important health problems affecting women worldwide. Early detection through appropriate screening strategies remains the cornerstone for reducing breast cancer-related mortality. The study assessed knowledge regarding breast cancer risk factors, warning symptoms, screening modalities such as Breast Self-Examination (BSE), Clinical Breast Examination (CBE), and mammography, as well as factors influencing screening behavior. The findings indicate that although awareness regarding the existence of breast cancer was relatively high, detailed knowledge regarding risk factors and recommended screening practices remained inadequate.

In the present study, 80% of participants had heard about breast cancer. However, awareness regarding preventive strategies and early detection methods was lower. This indicates that general awareness does not necessarily translate into appropriate health-seeking behavior. Similar observations have been reported by Indian researchers. Gangane et al. conducted a community-based study in rural central India and observed that although many women had heard of cancer, detailed knowledge regarding breast cancer symptoms and screening methods was poor. The authors emphasized the importance of culturally appropriate awareness programs to improve early diagnosis. [8]

Similarly, Dey et al. reported that awareness regarding breast cancer among Indian women was inadequate, particularly regarding screening practices and risk factors. They highlighted the need for strengthening community education and improving access to breast health services. [12]

International studies have also demonstrated this knowledge gap. Breast cancer awareness is often higher than participation in screening programs, particularly in low- and middle-income countries where healthcare accessibility remains limited. [13]

In the present study, family history was the most commonly recognized risk factor, whereas knowledge regarding obesity, hormonal factors, and lifestyle-related risks was limited. This finding is consistent with the study by Raina et al., who reported that Indian women commonly associated breast cancer with heredity but had poor awareness regarding reproductive and lifestyle-related risk factors. [14] Gupta et al. evaluated breast cancer awareness among Indian women and found that knowledge regarding modifiable risk factors such as obesity, physical inactivity, and dietary factors was inadequate. The authors suggested that awareness programs should focus on prevention strategies rather than only disease recognition. [4] International evidence also supports these findings. Studies from developing countries have reported that women often recognize family history as a risk factor but remain unaware of hormonal, reproductive, and lifestyle factors contributing to breast cancer development. [15]

The present study showed that a breast lump was the most commonly recognized warning sign, while awareness regarding nipple discharge, nipple retraction, skin changes, and axillary swelling was lower. Similar findings were reported by Yadav et al., who observed that breast lump was the most frequently identified symptom among Indian women, whereas other important early warning signs were poorly recognized. [16] A study by Kumar et al. among women attending a tertiary care hospital in India also demonstrated that recognition of breast cancer symptoms was associated with education level and previous exposure to health information. [17] Delayed presentation of breast cancer remains a major problem in India. Late diagnosis is often related to poor symptom recognition, fear of cancer, social stigma, and lack of access to diagnostic facilities. Increasing awareness regarding early symptoms may encourage women to seek medical attention at an earlier stage.

In this study, awareness regarding Breast Self-Examination (BSE) was higher than awareness regarding Clinical Breast Examination (CBE) and mammography. However, regular practice of screening methods was low. Similar results were reported by Somdatta and Baridalyne, who found that although awareness of breast self-examination existed among Indian women, regular practice was uncommon due to inadequate knowledge of technique and lack of motivation. [9] A study by Saha et al. reported poor mammography awareness among Indian women and identified lack of knowledge, cost concerns, and limited availability of screening facilities as important barriers. [5] Mammography remains an important tool for early detection; however, population-based mammography screening is challenging in India because of the large population, limited resources, and unequal distribution of healthcare facilities. Opportunistic screening integrated with primary healthcare services may therefore be a practical approach.

The present study demonstrated a significant association between higher educational status and better breast cancer awareness. This finding agrees with the observations of Babu et al., who reported that education was an important

determinant of breast cancer knowledge and screening behavior among Indian women. Women with higher education were more likely to recognize symptoms and utilize healthcare services. [10] Similarly, Singh et al. demonstrated that literacy, socioeconomic status, and access to health information significantly influenced awareness of breast cancer screening among Indian women. [18] Education improves health literacy, increases access to information, and promotes preventive healthcare practices. Therefore, breast cancer awareness programs should particularly target women with limited educational opportunities.

The major barriers identified in the present study were lack of awareness, fear of diagnosis, financial constraints, and limited accessibility. Indian studies have consistently identified similar barriers. Chopra et al. reported that fear, embarrassment, misconceptions, and inadequate knowledge significantly affected breast cancer screening behavior among Indian women. [19] In rural India, additional barriers include distance from healthcare facilities, dependence on family members for healthcare decisions, and limited availability of trained healthcare personnel. International studies have also reported comparable barriers, particularly in developing countries. Cultural beliefs, stigma, fear of cancer diagnosis, and limited healthcare infrastructure remain major challenges in improving screening participation. [20]

Healthcare professionals play a crucial role in improving breast cancer awareness. Counseling during routine gynaecological visits provides an opportunity to educate women regarding breast awareness, symptoms, and appropriate screening methods. Indian studies have shown that healthcare provider counseling significantly improves knowledge and willingness to participate in screening programs. [21] The integration of breast cancer education into existing maternal and reproductive healthcare services may provide an effective strategy for reaching women of different age groups.

CONCLUSION

Breast cancer awareness and early detection play a vital role in reducing disease-related morbidity and mortality. The present study highlights that although many women are aware of breast cancer, knowledge regarding risk factors, warning signs, and screening methods remains inadequate. Educational status, access to health information, and healthcare counseling were important factors influencing awareness and screening practices. Breast Self-Examination awareness was comparatively better, whereas knowledge and utilization of Clinical Breast Examination and mammography remained limited. Improving breast cancer education through healthcare providers, community awareness programs, and accessible screening services is essential to promote early diagnosis and improve outcomes among women. Regular counseling during gynaecological visits can serve as an effective strategy to increase participation in breast cancer screening programs.

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