

The Significance of Screening Mammography: A Preliminary Study

Fatima Khurshid¹, Ieraj Zia², Ume Anum Ayesha³, Fatima Yaqoob⁴,
Hafsa Khurshid⁵, Areeba Zia³, and Ayesha Khurshid⁶

ABSTRACT

Objectives: To assess the effectiveness of clinical breast examination, breast self-examination, and mammography screening in reducing breast cancer mortality in older, average-risk women, as well as the risks associated with screening

Methodology: A one-day mammography screening camp was held in Mirpur, Azad Jammu and Kashmir, Pakistan. This cross-sectional research included fifty women who were 40 years of age or older. A questionnaire on breast cancer screening attitudes was evaluated for validity. Bilateral mammography was performed after a clinical examination, and the results were reported using the ACR-BIRADS 5th edition guidelines.

Results: Mammography was performed on 50 women ranging in age from 40 to 65 years old, with a mean age of 48.6 years. Breast cancer screening behaviours (breast awareness, clinical breast examination, and mammography) were found to be substantially related to attitudes toward general health check-ups and perceived barriers to mammographic screening.

Conclusion: Regardless of cost constraints, a national programme for the diagnosis of breast cancer must include mammography, a tried-and-true screening technology. Mammography camps can be a very effective way to spread knowledge about these services and encourage people to use them.

Key Words: Breast cancer awareness, mammography, risk assessment, screening

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INTRODUCTION

Breast cancer, the second leading cause of death for women worldwide after lung cancer, is a frequent and expensive malignancy. With estimated yearly costs of 88 billion dollars and an average cost of almost 1.5 million dollars per affected woman, it imposes a

significant financial burden¹⁻³. Cancer's high mortality rate is mostly a result of the disease's late diagnosis, as survival is inversely correlated with the cancer's stage at diagnosis⁴. Breast cancer awareness is lacking. Women frequently visit hospitals near the end of their lives, at times of high mortality⁵.

Prevalence estimates in Pakistan are merely the tip of the iceberg⁶. Breast cancer incidence has increased by 50-100% in the last 20 years, according to trend analysis⁷. Male breast cancer is uncommon, accounting for less than 1% of all breast cancers, but there has been an increase in the frequency of the disease⁸. Breast cancer is distinct in that it can be quickly identified and caught early. However, because risk factors, access to systematic screening programmes and options for effective treatment vary across the world, so do breast cancer incidence, mortality, and survival rates⁷.

Early detection via screening programmes can lessen the morbidity and death linked to breast cancer⁹. It improves survival prospects, reduces the need for invasive therapy, and raises the likelihood that the disease will be successfully treated and cured^{10,11}. The two main actions for enhancing prognosis outcomes

1 Medical Officer, Department of Radiation, Oncology, Shifa International Hospital Ltd. Islamabad, Pakistan

2 Medical Officer, Department of Aesthetic Medicine, AR Dental and Skin Clinic, Mirpur AJK, Pakistan

3 Medical Officer/House Officer, Department of Medicine, DHQ Hospital, Mirpur AJK, Pakistan

4 Additional Medical Officer, District Health Office, Mirpur AJK Pakistan

5 Research Assistant, Department of Chemical Research, Mirpur University of Science and Technology, Mirpur AJK

6 Medical Student, Department of Physiotherapy, Mirpur University of Science and Technology, Mirpur AJK

Correspondence: Dr Fatima Khurshid, Medical Doctor. Department of Radiation Oncology, Shifa International Hospital Ltd. Islamabad, Pakistan

Email: fatimakhurshid61@yahoo.com

have been recognized as ensuring the availability of early diagnostic and screening services and acting quickly¹². According to studies, when compared to industrialized countries, most developing countries have poor prognosis and high mortality rate as a result of diagnosis of breast cancer in advanced stages^{13, 14}.

Breast self-examination (BSE), clinical breast examination (CBE), and mammography are all crucial preventive methods for the early detection of breast cancer. In low-resource areas with limited access to diagnostic facilities, it is crucial to empower women with BSE while screening for breast cancer^{15,16}. Despite the fact that mammography is frequently employed and advised for breast cancer screening, new screening techniques have emerged that have not been well examined for their effects on breast cancer mortality. The effectiveness of these tools in reducing breast cancer mortality is uncertain, despite their implementation in community settings^{13,17,18}. The aim of the study is to evaluate the benefits and dangers of clinical breast examination, breast self-examination, and mammography in lowering the death rate from breast cancer in older, average-risk women.

METHODOLOGY

In August 2023, a one-day screening mammography camp was held at the Aliya Begum Diagnostic and Cancer Care Centre in Mirpur, Azad Jammu and Kashmir (AJK). Since there is no ethical committee in the hospital, this study received ethical approval from the owner of the hospital where the camp is located. Informed consent was obtained to ensure that the study was conducted in accordance with ethical considerations such as participant confidentiality, and ensuring disclosure. The camp's objectives were to raise breast cancer awareness and encourage screening among women over 40. By handing out flyers and spreading the news, the public was made aware of the camp. The camp was performed in accordance with the ethical standards required for a prospective observational study. The study's goal was to observe the participants' outcomes and experiences. The camp's overall goal was to raise awareness and deliver free mammography services to the target community.

The convenience sample method was utilized in this investigation, including 50 willing participants. Instead of choosing the participants at random, they were chosen based on their willingness to participate. A complete clinical examination and pertinent history-taking were done before the mammogram. In a cross-sectional design, data was collected at a given point

in time in a cross-sectional manner, allowing for the investigation of correlations between variables.

Three elements made up the data collection tool: demographic information (such as age, marital status, economic situation, and level of education); questions to determine awareness of suggested screening methods for early breast cancer detection (including breast self-examination and mammography); and the Breast Cancer Screening Belief Questionnaire (BCSBQ) for screening. The 13-item Breast Cancer Screening Belief Questionnaire (BCSBQ) was developed by Kwok et al. in 2010. It looks at how women perceive several aspects of breast cancer screening, such as attitudes towards general health assessments, knowledge, attitudes, and perceptions of the disease, as well as screening practices like mammography. The survey uses a Likert-type scale with a range of 1 to 5, and converts the total score into a scale from 0-100. The BCSBQ is regarded as a credible and useful measure for examining women's perceptions about breast cancer screening¹⁹.

Before having bilateral mammography on a GE Senographe DS digital mammography machine, study participants gave written informed consent. Mammograms were performed using the proper compression forces, and for each breast, both medio-lateral oblique and cranio-caudal images were obtained. To guarantee the best possible imaging quality, the machine was set to the Automatic Optimization of Parameters (AOP) mode²⁰. The mammograms in the console were examined by a radiologist with five years' experience in breast imaging, and they were then reported in compliance with the guidelines of the 2013 ACR-BIRADS 5th edition. Any mass, asymmetry, architectural distortion, calcifications, or ancillary findings were recorded using words from the fifth edition of ACR BIRADS²¹. Due to the use of X-rays during the procedure, all the women received information on the procedure and the safety of mammography.

The Statistical Package for the Social Sciences (commonly known as IBM SPSS version 20) was used to compile a summary of the characteristics of the participating women using descriptive statistics and exploratory factor analysis (EFA). The present study employed appropriate statistical tests, such as correlation analysis or regression analysis, to evaluate the relationship between breast cancer screening behaviours (breast awareness, clinical breast examination, and mammography), attitudes towards general health check-ups, and perceived barriers to mammographic screening.

RESULTS

Fifty women of all ages 40 to 65 (mean 48.6 years), participated in the study. All of these women were Mirpur, AJK residents who were married. Forty per cent of the women reported having a job, compared to 54% who were unemployed. This suggests a mixture of employed and unemployed study participants. In terms of education, 10% of the women had only completed their primary or elementary education, 20% had post-graduate degrees, and 30% had graduated. Table 1 illustrates the participants' various educational backgrounds.

Table 1: Demographic Characteristics of Participants

Characteristics	Number	%	Mean	Standard Deviation	Variance
Age					
40-44	15	30%	48.6	7.021	49.305
45-49	13	26%			
50-54	12	24%			
55-59	5	10%			
60-64	5	10%			
Marital Status					
Married	50	100%	1.0000	0	0
Unmarried	0				
Employment					
Employed	20	40%	1.6500	0.58714	0.345
Unemployed	27	54%			
Retired	3	6%			
Education					
Uneducated	10	20%	3.8000	1.88065	3.537
Primary	5	10%			
Middle	5	10%			
Secondary	0	0			
Higher Secondary	5	10%			
Graduate	15	30%			
Post-Graduate	10	20%			
Residence					
Mirpur	50	100%	1.0000	0	0

The frequency of mammography screenings, clinical breast examination frequency, and attitudes toward general health checkups were all significantly linked with perceived barriers to mammographic screening and breast cancer awareness. The distribution of participants by awareness about breast cancer screening and frequency of practice is shown in Table 2. The findings reveal that most participants were aware of breast cancer. The study also showed that the individuals held false beliefs and concepts that were based on myths.

Female participants reported different levels of breast awareness: 20% reported annual awareness, 30% reported once every few month awareness, and 26% reported monthly awareness. Unexpectedly, 24% of interviewees said they had never been breast conscious. However, just 4% of the patient who were already diagnosed with breast cancer had had diagnostic mammogram rather than screening mammogram, while

Table 2: The Frequency of Breast Cancer Screening Practices

Breast Cancer Screening Practices	Frequency	Percentage	Mean	Standard Deviation	Variance
Breast Awareness					
1. Once a Month	13	26%	2.45	1.145	1.31
2. Once every few months	15	30%			
3. Once a year	10	20%			
4. Never	12	24%			
Clinical Breast Examination					
1. A year or less	13	26%	2.90	1.29	1.67
2. More than a year or less than 2 years	5	10%			
3. Two to three years or more than three years	7	14%			
4. Never had one	25	50%			
Mammogram					
1. Once a year	2	4%	3.85	0.67	0.45
2. Once every two years	0	0			
3. Once every three years or more	0	0			
4. Never	48	96%			

the other 96% had never had one. For early identification and prevention, routine mammograms and breast awareness are essential. It is alarming that many of the participants did not consider these exams important. To raise awareness and guarantee prompt identification and action, it is crucial to emphasize the value of routine breast exams and mammograms.

According to the analysis of the Breast Cancer Screening Belief Questionnaire (BCSBQ), the study's participants showed a positive attitude towards and a knowledge of the usefulness of routine physicals. Divergent perspectives on breast cancer were expressed, including disagreements over whether it should be considered a death sentence, different opinions on its prognosis and degree of suffering, and disagreements over the notion that little can be done to lower mortality rates. There were differences in individuals' perceptions of how fate affected the onset of breast cancer. Participants disagreed on worries about pain, transportation issues, language hurdles, and potential embarrassment, but overall they did not view mammographic screening to be significantly hampered. Regarding the degree of embarrassment connected to getting a mammogram, some conflicting views were noticed (Table 3 and Table 4).

Table 5 shows the various breast components detected during mammography in the study participants. Eighteen women exhibited fat density parenchyma, a sign of less dense breast tissue. Fifteen women had mixed-density parenchyma, or tissue that was both fatty and thick. There was a higher percentage of thick

Table 3. The Breast Cancer Screening Beliefs Questionnaire

Attitude Towards General Health Checkup	Score 01 Strongly Agree	Score 02 Agree	Score 03 Neutral	Score 04 Disagree	Score 05 Strongly Disagree
1: If I feel well, it is not necessary to have a health check-up.	15	5	3	25	2
2: If I follow a healthy lifestyle such as a balanced diet and regular exercise, I don't feel it is necessary to have a regular health check-up.	10	2	8	30	0
3: I see a doctor or have my health check-up only when I have a health problem.	23	27	0	0	0
4: If I feel healthy, I do not need to see the doctor.	17	23	3	7	0
Knowledge and Perceptions about Breast Cancer					
5: Breast cancer is like a death sentence; if you get it, you will surely die from it.	0	7	0	30	13
6: Breast cancer cannot be cured; you can only prolong the suffering.	0	13	7	23	7
7: Even if breast cancer is detected early, there is very little a woman can do to reduce the chances of dying from it.	3	12	0	30	5
8: If a woman is fated to get breast cancer, she will get breast cancer; there is nothing she can do to change fate.	5	15	10	17	3
Barriers to Mammographic Screening					
9: I'm worried that having a mammogram will hurt my breasts.	3	12	5	18	12
10: It would be difficult to arrange transportation for getting a mammogram.	3	2	3	37	5
11: I don't want to have a mammogram because I can't speak English.	0	0	0	33	17
12: I don't want to go for a mammogram because I would need to take off my clothes and expose my breasts.	0	3	5	32	10
13: Having a mammogram is embarrassing.	2	15	8	20	5

Table 4: Evaluation of BCSBQ

BCSBQ Components	Factors	Mean	Standard Deviation
Attitude Towards General Health Checkup			
1: If I feel well, it is not necessary to have a health check-up.	0.880	2.90	1.447
2: If I follow a healthy lifestyle such as a balanced diet and regular exercise, I don't feel it is necessary to have a regular health check-up.	0.863	3.25	1.251
3: I see a doctor or have my health check-up only when I have a health problem.	0.852	1.55	0.51
4: If I feel healthy, I do not need to see the doctor.	0.636/0.567	2.00	1.026
Knowledge and Perception about Breast Cancer			
5: Breast cancer is like a death sentence; if you get it, you will surely die from it.	0.761	3.95	0.945
6: Breast cancer cannot be cured; you can only prolong the suffering.	0.617/0.442	3.50	1.051
7: Even if breast cancer is detected early, there is very little a woman can do to reduce the chances of dying from it.	0.733	3.45	1.146
8: If a woman is fated to get breast cancer, she will get breast cancer; there is nothing she can do to change fate.	0.680	2.95	1.146
Barriers to Mammographic Screening			
9: I'm worried that having a mammogram will hurt my breasts.	0.787	3.50	1.277
10: It would be difficult to arrange transportation for getting a mammogram.	0.857	3.80	0.894
11: I don't want to have a mammogram because I can't speak English.	0.744/0.404	4.35	0.489
12: I don't want to go for a mammogram because I would need to take off my clothes and expose my breasts.	0.838	4.00	0.725
13: Having a mammogram is embarrassing.	0.750	3.35	1.04

tissue in four women's parenchymas that were heterogeneously dense. Seven of the women had hyperdense breast tissue, which is defined by significantly increased tissue density. For a woman with a history of left breast cancer, there were no indications of recurrent disease found in the left mastectomy bed. However, a right-side sono-mammogram revealed tiny breast cysts, which produced a BIRADS Category II sono-mammogram result. This classification denotes benign results with a low likelihood of cancer.

Table 5: Breast Composition on Mammography

Breast Composition	Number of Participants
Fat Density Parenchyma	18
Mixed Density Parenchyma	15
Heterogeneously Dense Parenchyma	10
Hyperdense	7

The following results were obtained during the evaluation using bilateral mammography: 4% of the females had new cases of breast cancer. 10% of patients were given the go-ahead to undergo brief interval follow-up because of likely benign findings. A low suspicion of malignancy was indicated by the BIRADS II findings in 44% of the cases. Forty per cent of the women received BIRADS I results, suggesting a normal interpretation of the mammography with no obvious abnormalities found (Table 6).

Table 6: ACRBIRADS: American College of Radiology-Breast Imaging Reporting and Data Systems

ACR-BIRADS Category	Number of Females	Percentage
BIRADS I	20	40%
BIRADS II	22	44%
BIRADS III	5	10%
BIRADS IV	0	0
BIRADS V	3	6%

DISCUSSION

Due to its high incidence and prevalence, overcrowded healthcare systems, and elevated direct medical costs, breast cancer has been acknowledged as a significant public health issue in both developed and developing countries⁶. The high number of unrecognized/hidden cases in Pakistan seriously jeopardizes the survival rate of female cancer patients. The conservative nature of the society, women's hesitation to seek medical care, customs, illiteracy, ignorance, and the absence of a widespread screening programme can all be linked to this. In India, the incidence rates of breast cancer have drastically grown with each passing year^{5,22,23}.

The multifactorial etiology of breast cancer involves a wide range of endogenous (hormonal/genetic) and

exogenous (drugs, radiation) factors. Additional risk variables include age, parity, breastfeeding practices, hormone therapy, dietary considerations, alcohol consumption, family history, age at menarche, menopausal status, genetic mutations, and benign breast disease. Typical symptoms of breast cancer include a tumor in the breast and bloody nipple leaking^{7,25-27}.

Early identification of breast cancer is crucial, particularly in developing countries with low income. Breast self-examination (BSE) has been suggested as an early detection technique. BSE is an inexpensive, straightforward, and non-invasive procedure that women can carry out on their own. It raises awareness, promotes healthy lifestyle choices, and may help find tiny tumors. However, there is some disagreement regarding the efficacy of BSE, and there are obstacles like lack of knowledge, time restraints, and cultural attitudes. To clarify the role of BSE and remove these obstacles, more studies are required^{7,17,18}. More female participants were attracted to the screening camp held as part of this study. This illustrates the importance of educating the public about these medical disorders by using word-of-mouth, healthcare professionals, handouts, etc. to combat ignorance, reluctance, and taboo. Without the awareness raised by the camp, the majority of the girls would not have had mammograms and clinical breast exams.

Screening techniques that reduce mortality include mammography and clinical breast examination. There is little evidence, however, that a clinical breast examination utilized as a stand-alone screening method reduces mortality. The methods used in clinical examinations are also not standardized²⁴.

There were a total of 13 items on the BCSBQ, with three components being 'attitude toward health checks,,', 'knowledge and perception regarding breast cancer', and 'mammography screening practice.' One being highly agree and five being strongly disagree, were used to rate the questions on a 5-point Likert scale. The better one understands breast cancer and the more one is willing to view physical examinations and breast cancer screening, the higher one's score is.

The CBCSBQ, in particular, looked into the use of mammography as a breast cancer screening method. Mammography is the most sensitive for detecting lesions in breasts with distributed fibroglandular densities or breasts that are completely fatty. The sensitivity of film screen mammography decreases when the breast parenchymal composition is dense. Breast density is also associated with an increased chance of developing breast cancer. The sensitivity of detecting lesions in dense breasts has improved with

digital mammography. MRI and ultrasonography support the screening regimen but cannot be utilized in place of mammography as the primary screening modality^{5,22,23}.

According to Bleyer and Welch's study, there is a high danger of over-diagnosis and overtreatment with mammography as a screening tool, but it has little effect on lowering mortality rates²⁵.

However, in a country like Pakistan where many instances are only found in the later stages, resulting in higher mortality rates, such a technique can only boost survival. There are rules governing the use of mammography as a screening method in many US states, and these laws are periodically amended as necessary²⁴. A mammography-based breast cancer screening programme in Pakistan is alleged to not be financially feasible⁵. It is the right time to start a thorough breast cancer screening programme in the current environment with Pakistan's expanding economy and focus on gender sensitivity. We can address societal taboos and hesitations and ensure that early identification of breast cancer has the greatest impact by holding mammography camps, clinical breast examinations, and awareness programmes. In order to advance gender equality and protect women's health, it is administratively necessary to increase mammography services and resource allocation. Some of the limitations of the study were that the sample size was small. There were only 50 women of a given age and location. Another important limitation of this study was the lack of a control group. These results may not apply to the entire population of women who have mammograms. Future research should aim to include larger, more diverse samples to examine the relationship between mental health, demographic variables, and the impact of associated factors on women's mammography experience.

CONCLUSION

In conclusion, this preliminary study highlights the importance of breast cancer screening for early detection and reduction of mortality. Priority should be given to including mammography in national screening, as it is a proven and reliable method despite financial constraints. Mammography camps can be an effective tool to raise awareness and encourage the use of screening services. In addition, addressing issues such as transportation, language and culture, breast awareness and routine screening are important to increase treatment, evaluate and ultimately reduce the burden. By implementing comprehensive screening and educating women about the importance of early

detection, we can make a positive impact in preventing breast cancer and saving lives.

Conflict of interest: Authors declare that there is no conflict of interest.

Authors' Contribution: FK: Study design and concept, manuscript writing, data collection, analysis and literature review, IZ: Data collection, UAA: Discussion writing, FY: Literature review, abstract writing, AK, AZ: Literature review, HK: Data analysis

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