Original Article

Awareness of Breast Cancer in Patients at A Tertiary Care Hospital in Pakistan: A Cross-Sectional Study

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Abstract

Background: Breast cancer (BCa), currently the most common cancer in the world, accounts for 12.5% of all cancer cases annually. Promoting awareness regarding BCa can lead to an early diagnosis, thereby reducing mortality and improving the prognosis of the disease.
Objectives: This research aims to assess BCa awareness in Rawalpindi, Pakistan, and identify the factors associated with the level of awareness.
Materials and Methods: A descriptive cross-sectional study was conducted in Rawalpindi, Pakistan, from August to September 2023. A sample size of 350 was calculated. Inclusion criteria were women aged 18 and above from wards and the OPD waiting list of a tertiary care hospital. Data was collected using a previously tested questionnaire after obtaining informed consent from the participants.
Results: The study found that 57% of the participants had good awareness of BCa signs and symptoms. Higher education was associated with a better awareness of changes in the position of the nipple as a warning sign ($p<0.001$). Retired occupation was associated with a better awareness of pain in one of your breasts or armpits as an alarming sign of BCa ($p<0.001$).
Conclusion: This study showed that more than half of the women had good awareness about BCa warning signs. Higher education and retired education were associated with better awareness of BCa warning signs.
Keywords: Cross-sectional, BCa, tertiary care hospital, awareness, tertiary care.

Introduction

Breast Cancer (BCa), currently the most common cancer in the world, accounts for 12.5% of all cancer cases annually [1] It has been associated with very high mortality. In 2020 alone, BCa accounted for 685,000 deaths globally.[2] A large majority of these cases have been reported from low-to middle-income countries (LMICs) like Pakistan.[3–5] BCa is the most frequently occurring cancer in Pakistan, occurring in about 1 out of every 9 women 3. In the year 2020 alone, 178,388 new cases of BCa were registered in the country.[6] Though early detection of BCa by self-examination has led to a decline in mortality of BCa by 18% in the modern world, LMICs like Pakistan are still challenged by this. Delay in diagnosis, owing to lack of facilities, and lack of awareness among the general public regarding BCa, its signs and symptoms, and self-examination play a pivotal role in the rising incidence and mortality of BCas in the LMICs.[3,7] Conversely, an increased survival rate is seen in developed countries due to adequate awareness among the people.

BCa awareness is measured as the knowledge of an individual regarding the signs and symptoms of BCa and its available diagnostic and treatment modalities. In Pakistan, awareness related to breast cancer remains alarmingly low. On average, fewer than half of Pakistani women are familiar with at least one risk factor, symptom, or screening method associated with the disease. About 50% are aware of treatment options.[8] Routine breast self-examination (BSE) is practiced by less than a third of women, and fewer than 20% have ever had a clinical breast examination (CBE).[8] One study reported that 63.2% of participants lacked basic knowledge about breast cancer, while 64.7% and 83.2% were unfamiliar with mammography and BRCA genetic testing, respectively.[9] Similarly, research conducted in Lahore revealed that 80.2% of women did not know that breast cancer is a global health issue, 65.3% incorrectly believed that the disease does not affect everyone, and only 42.1% could recognize its symptoms.[10] These findings highlight the critical role that awareness plays in early detection. Previous studies have consistently shown that enhancing awareness about BCa can promote timely diagnosis, ultimately reducing mortality and significantly improving patient outcomes.[11,12]

We conducted this research to assess the current level of awareness regarding BCa among the general population of Rawalpindi and to identify the factors associated with their level of awareness.

Materials and Methods

A cross-sectional study for assessing BCa awareness was conducted at the Allied hospitals Rawalpindi Medical University, including Holy Family Hospital, Benazir Bhutto Hospital, and District Headquarter Hospital, from August to September 2023. A sample size of 350 was calculated using the WHO sample size calculator at a confidence interval of 95%, and a margin of error of 5% using a population proportion of 11.1%.[13] A non-probability convenience sampling technique was utilized. The study was conducted on women over the age of 18 who were in the hospital wards and OPD's waiting rooms. Knowledge regarding the signs and symptoms of BCa was used to assess the level

of awareness. To assess participants' awareness regarding breast cancer warning signs, an 11-item questionnaire was used, with each item evaluated on a 5-point Likert scale. Responses ranged from "Strongly Disagree" (scored as 1) to "Strongly Agree" (scored as 5), with increasing values indicating higher levels of awareness. Each participant's responses across the 11 items were numerically coded and summed to generate an individual awareness score, with a minimum possible score of 11 and a maximum of 55. Higher total scores reflected greater awareness of breast cancer signs and symptoms. The mean awareness score was calculated by dividing the cumulative awareness scores of all participants by the total number of respondents (N = 350).

After obtaining informed consent data was collected using a modified version of the Breast Cancer Awareness Measure (BCAM) which was validated by Elshami M. et al.[14] The collected data was analyzed using SPSS 26. Descriptive statistics were presented as Mean ± SD for categorical variables and as frequency (percentage) for continuous variables. Chi-test and T-test were used for categorical and continuous variables, respectively.

Results

The total number of participants in this study was 350. The mean age of participants was 36.23 years with a standard deviation of 0.689 (Figure 1). Unemployed/housewife was the most common occupation among the participants (65.7%). The highest level of education of participants was mostly secondary (36%), and 62.3% of them were married.

Table 1 *Demographic Details of Participants*

Variables	**Frequency (n=450)**
Age (Mean+_SD)*	36.23 +_ 0.689 years
Highest level of education	Frequency (Percentage)*
Bachelor degree	98 (28.0)
Illiterate	58 (16.6)
Postgraduate	4 (1.1)
Primary	62 (17.7)
Secondary	126 (36.0)
Occupation	
Employed	58 (16.6)
Retired	6 (1.7)
Student	54 (15.4)
Unemployed/housewife	230 (65.7)

Note. *Continuous variables presented as Mean+_SD, and Discrete variables presented as Frequency (Percentage)

Table 2 *Level of Awareness of Participants*

Items	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1. A change in the location of the nipple	54 (15.4%)	38(10.9%)	50(14.3%)	180(51.4%)	26 (7.4%)
2. Tugging in of the nipple	36(10.3)	40(11.4%)	88(25.1%)	142(40.6%)	42(12.0%)
3. Pain in one of the breasts or armpit	40(11.4%)	34(9.7%)	56(16.0%)	160(45.7)	58(16.6%)
4. Wrinkling or dimpling of the breast skin	42(12.0%)	38(10.9%)	76(21.7%)	144(41.1%)	48(13.7%)
5. Oozing or bleeding from the nipple	50(14.3%)	16(4.6%)	66(18.9%)	148(42.3%)	68(19.4%)
6. A Mass or stiffening in the breast	50(14.3%)	22(6.3%)	74(21.1%)	118(33.7%)	84(24.0%)
7. Nipple rash	28(8.0%)	70(20.0%)	96(27.4)	110(31.4%)	44(12.6%)
8. Erythema of the breast skin	38(10.9%)	62(17.7%)	72(20.6%)	120(34.3%)	56(16.0%)
9. Mass or stiffening under the armpit	52(14.9%)	34(9.7%)	66(18.9%)	138(39.4%)	58(16.6%)
10. Changes in the size of the breast or nipple	54(15.4%)	14(4.0%)	78(22.3%)	126(36.0%)	76(21.7%)
11. Alterations to the nipple or breast form	46(13.1%)	14(4.0%)	70(20.0%)	152(43.4%)	66(18.9%)

Note. Data presented as Frequency (Percentage)

Higher education was significantly associated with greater awareness of breast cancer warning signs as shown in Table 3. Participants with a bachelor's degree were more likely to recognize changes in the position of the nipple as a warning sign compared to those with primary or no formal education (30.8% vs. 15.4%, $p<0.001$). Similarly, a greater proportion of bachelor's degree holders than illiterates considered pulling in of the nipple, breast pain, and puckering of the breast skin as indicative of breast cancer (44.1%, 49.4%, and 46.9% vs. 51.7%, 41.4%, and 41.4%, respectively). However, illiterate participants were more likely than bachelor's degree holders to agree that a lump in the breast, redness of the breast skin, or changes in the shape of the breast/nipple were warning signs of cancer.

Table 3 *Association between Educational Status and Awareness of Breast Cancer Warning Signs.*

Items	Bachelors	Illiterate	p-value
1. A change in the location of the nipple	30.8%	15.4%	**<0.001**
2. Tugging in of the nipple	44.1%	51.7%	0.433
3. Pain in one of the breasts or armpits	49.4%	41.4%	0.451
4. Wrinkling or dimpling of the breast skin	46.9%	41.4%	0.611
5. Oozing or bleeding from the nipple	18.4%	24.1%	0.511
6. A Mass or stiffening in the breast	32.7%	51.7%	**0.029**
7. Nipple rash	26.5%	41.4%	0.081
8. Erythema of the breast skin	32.7%.	55.2%	**0.009**
9. Mass or stiffening under the armpit	28.6 %	55.2 %	**0.002**
10. Changes in the size of the breast or nipple	30.6%	48.3%	**0.042**
11. Alterations to the nipple or breast form	16.3%	24.1%	0.324

Note. Data presented as percentage

A significant association was also observed between occupation and awareness as shown in Table 4. Retired participants demonstrated the highest level of awareness regarding nipple changes (33.3% strongly agreed, $p<0.001$), whereas students reported the lowest recognition (3.7%). Retired individuals were also more likely to identify nipple pulling, breast pain, puckering/dimpling, and shape changes as warning signs compared to employed participants and students. In contrast, students were more likely to report discharge or bleeding from the nipple and breast lumps as cancer warning signs.

Table 4 *Association between Occupational Status and Awareness of Breast Cancer Warning Signs*

Items	Retired and employed	Unemployed / housewives and students	p-value
1. A change in the location of the nipple	33.3	3.7	**<0.001**
2. Tugging in of the nipple	44.4	43.5	1.000
3. Pain in one of the breasts or armpit	66.7	43.5	**0.001**
4. Wrinkling or dimpling of the breast skin	66.7	6.9	**<0.001**
5. Oozing or bleeding from the nipple	0	29.6	**<0.001**
6. A Mass or stiffening in the breast	66.7	33.9	**<0.001**
7. Nipple rash	33.3	7.4	**<0.001**
8. Changes in the size of the breast or nipple	33.3	14.8	**0.001**

Note. Data presented as percentage

Discussion

In Pakistan, as seen in other low-to-middle-income countries (LMICs), women face numerous challenges, one of these significant hurdles is combating BCa, which stands as the most prevalent cancer among them. As previously highlighted in the literature, insufficient awareness and misinterpretation of symptoms significantly contribute to delayed presentation in our country.[3] This has led to a trend of poor prognosis and increased mortality rates among BCa patients. Because of the established correlation between awareness, improved screening, and consequently early detection—factors that significantly contribute to enhanced treatment and prognosis, we formulated this study to determine the extent of BCa awareness among women in the Country.

Our gathered data unveiled intriguing insights regarding the correlation between education levels and perceptions of BCa symptoms. Literate participants displayed a greater inclination towards recognizing the change in the position of the nipple, pulling in of the nipple, pain in the breast or armpit, puckering or dimpling of the skin of the breast, lump or thickening on the breast as potential signs of BCa. Conversely, among the illiterate participants, a higher consensus existed concerning pulling in of the nipple, lump or thickening on the breast, redness of the breast skin, and alterations in breast shape as indicative of BCa.

In our comprehensive assessment of factors assessing awareness levels, occupation emerged as significantly intertwined with the level of understanding regarding BCa, notably pertaining to changes in nipple position. These findings are in alignment with previously conducted studies.[15] Moreover, studies in diverse geographic locations have highlighted significant associations of various other factors with BCa awareness as well, possibly stemming from differences in study populations or methodologies.

This study's outcomes, akin to some previous research, underscore a concerning lack of awareness among students regarding the signs and symptoms of BCa. A mere 3.7% of students acawarenessd the significance of nipple position changes as a potentially alarming sign of BCa. This discrepancy in awareness might be attributed to prevalent misconceptions, such as the belief that BCa predominantly affects older women only, leading to a general disinterest in the subject among the younger demographic.[15] Additionally, the proliferation of misinformation about BCa on the internet might be contributing to this gap in awareness. Interestingly, studies conducted in regions like Gaza, Egypt, Iraq, and Ethiopia presented contrasting results, depicting a comparatively higher level of awareness among their student populations.[16-18]

In a comparative analysis of BCa awareness among various demographic groups, retired women emerged as notably more informed about the signs and symptoms of BCa when contrasted with their counterparts, employed women and students. This finding was substantiated by a comprehensive study conducted in Saudi Arabia, which also underscored a prevailing trend: the depth of awareness regarding BCa proved to be strongly correlated with the age of women rather than their educational attainment.[19] This

observation highlights the significance of age as a determinant factor in fostering heightened awareness and understanding of BCa, eclipsing the conventional assumption of education as the primary influencer of awareness levels.

These findings hold critical implications for public health efforts in LMICs like Pakistan. The clear link between awareness and early detection of BCa highlights the urgent need for targeted awareness campaigns. Public health initiatives must focus not only on disseminating accurate information about BCa symptoms but also on demystifying misconceptions, especially among younger women and students. Integrating breast health education into school and university curricula, along with community-based awareness programs, could bridge this knowledge gap early.

Furthermore, outreach efforts should be tailored to specific demographics, such as illiterate women or those in rural communities, using visual aids, vernacular languages, and culturally sensitive materials. Given that retired women in this study demonstrated comparatively higher awareness, they could potentially be engaged as community health advocates, helping to foster peer education at the grassroots level.

Strengthening primary healthcare systems to support routine clinical breast exams (CBEs), coupled with broader access to screening tools such as mammography, will also be crucial. Without these infrastructure changes, even well-informed individuals may face barriers to timely diagnosis and care.

Lastly, policymakers must prioritize funding for national breast cancer control programs that emphasize education, screening access, and early referral systems. By addressing both knowledge deficits and systemic healthcare limitations, Pakistan can take meaningful strides in reducing breast cancer morbidity and mortality.

It is essential to note that the limitations of the sampling technique employed in our study necessitate caution when generalizing the results to the broader population. Our relatively small sample size might have introduced bias into the results. Therefore, conducting larger-scale studies with more robust sampling techniques becomes imperative for ensuring the generalizability of these findings.

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Conclusion

This study showed that more than half women had good awareness about BCa warning signs. Higher education and retired education were associated with better awareness of BCa warning signs. Keeping in view the results of our study, effective educational measures aimed at enhancing the public's knowledge about BCa should be implemented. We recommend that future investigations in this

field employ a probability sampling technique to enhance the inclusivity of the study participants and broaden the applicability of the conclusion, thereby yielding stronger and more reliable outcomes.

References

1. Khan S, Jalees S, Jabeen Z, Khan M, Qadri RH, Adnan H, et al. Myths and Misconceptions of BCa in the Pakistani Population. Cureus [Internet]. 2023 Jun 7 [cited 2023 Oct 15];15(6). Available from: /pmc/articles/PMC10327610/
2. BCa [Internet]. [cited 2023 Oct 15]. Available from: https://www.who.int/news-room/fact-sheets/detail/breast-cancer
3. Ullah Z, Khan MN, Din ZU, Afaq S. BCa Awareness and Associated Factors Amongst Women in Peshawar, Pakistan: A Cross-Sectional Study. BCa (Auckl) [Internet]. 2021 [cited 2023 Oct 11];15. Available from: /pmc/articles/PMC8236781/
4. Fares MY, Salhab HA, Khachfe HH, Khachfe HM. BCa Epidemiology among Lebanese Women: An 11-Year Analysis. Medicina (B Aires) [Internet]. 2019 Aug 1 [cited 2023 Oct 11];55(8). Available from: /pmc/articles/PMC6723716/
5. Labisso WL, Leka Y, Leka Y, Haileselassie W. A Descriptive Cross-Sectional Study on Awareness and Belief of People About Cancer in Southern Ethiopia: Special Focus on Breast and Cervical Cancers. Risk Manag Healthc Policy [Internet]. 2020 [cited 2023 Oct 15];13:2655. Available from: /pmc/articles/PMC7682616/
6. Ali MM, Khokhar MA, Ahmed HN. Primary care physicians and cancer care in Pakistan: A short narrative. J Cancer Policy. 2020 Sep 1;25:100238.
7. Woof VG, Ruane H, Ulph F, French DP, Qureshi N, Khan N, et al. Engagement barriers and service inequities in the NHS Breast Screening Programme: Views from British-Pakistani women. J Med Screen [Internet]. 2020 [cited 2023 Oct 11];27(3):130. Available from: /pmc/articles/PMC7645618/
8. Abdul Rehman M, Tahir E, Ghulam Hussain H, Khalid A, Taqi SM, Meenai EA. Awareness regarding breast cancer amongst women in Pakistan: a systematic review and meta-analysis. PLoS One. 2024 Mar 7;19(3):e0298275. doi:10.1371/journal.pone.0298275
9. Shoukat Z, Shah AJ. Breast Cancer Awareness and Associated Factors among Women in Pakistan: A Cross-Sectional Descriptive Study. Asian Pacific Journal of Cancer Prevention. 2023;24(5):1561–70. doi:10.31557/APJCP.2023.24.5.1561
10. Aslam A, Mustafa AG, Hussnain A, Saeed H, Nazar F, Amjad M, et al. Assessing awareness, attitude, and practices of breast cancer screening and prevention among general public and physicians in Pakistan: a nation with the highest breast cancer incidence in Asia. Int J Breast Cancer. 2024 Sep 28;2024:2128388. doi:10.1155/2024/2128388
11. Noreen M, Murad S, Furqan M, Sultan A, Bloodsworth P. Knowledge and awareness about BCa and its early symptoms among medical and non-medical students of Southern Punjab, Pakistan. Asian Pac J Cancer Prev [Internet]. 2015 [cited 2023 Oct 15];16(3):979–84. Available from: https://pubmed.ncbi.nlm.nih.gov/25735392/
12. Madanat H, Merrill RM. BCa risk-factor and screening awareness among women nurses and teachers in Amman, Jordan. Cancer Nurs [Internet]. 2002 [cited 2023 Oct 15];25(4):276–82. Available from: https://pubmed.ncbi.nlm.nih.gov/12181496/
13. Menhas R, Umer S. BCa among Pakistani Women. Iran J Public Health [Internet]. 2015 Apr 1 [cited 2023 Oct 15];44(4):586. Available from: /pmc/articles/PMC4441973/
14. Elshami M, Al-Slaibi I, Jamal Ghithan R, Alser M, Ramzi Shurrab N, Osama Ismail I, et al. Women's awareness of breast cancer symptoms: a national cross-sectional study from Palestine. 2021 [cited 2023 Oct 11]; Available from: https://doi.org/10.1186/s12889-022-13224-7
15. Masood I, Saleem A, Hassan A, Sadeeqa S, Akbar J. A quantitative study to assess BCa awareness among females in Bahawalpur, Pakistan. Cogent Med [Internet]. 2016 Dec 31

[cited 2023 Nov 14];3(1):1236479. Available from: https://www.tandfonline.com/doi/abs/10.1080/2331205X.2016.1236479

16. Abo Al-Shiekh SS, Ibrahim MA, Alajerami YS. BCa Knowledge and Practice of Breast Self-Examination among Female University Students, Gaza. The Scientific World Journal [Internet]. 2021 [cited 2023 Nov 14];2021. Available from: /pmc/articles/PMC8100409/
17. Tewabe T, Mekuria Z. Knowledge and practice of breast self-examination among undergraduate students in Bahir Dar University, North-West Ethiopia, 2016: A cross-sectional study. J Public Health Afr [Internet]. 2019 May 5 [cited 2023 Nov 14];10(1). Available from: /pmc/articles/PMC6562255/
18. Abdul-Lateef SJ, Shabaan M. Assessment of Female Nursing Students' knowledge and practice about Breast Self-Examination in Mosul University. Mosul Journal of Nursing [Internet]. 2019 Jun 1 [cited 2023 Nov 14];7(1):30–6. Available from: https://mjn.mosuljournals.com/article_162123.html
19. Alshareef B, Yaseen W, Jawa W, Barnawe Y, Alshehry W, Alqethami H, et al. BCa Awareness among Female School Teachers in Saudi Arabia: A Population-Based Survey. Asian Pac J Cancer Prev [Internet]. 2020 Feb 1 [cited 2023 Nov 15];21(2):337. Available from: /pmc/articles/PMC7332133/