Breast Cancer Awareness and Associated Factors Amongst Women in Peshawar, Pakistan: A Cross-Sectional Study

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ABSTRACT

BACKGROUND: Breast cancer is the most common cancer in women, and the second overall, following lung cancer. Breast cancer can occur at any age, with an increased incidence in women 40 years and above. Worldwide the incidence is around 1 million cases per year, 60% of the cases reported from low- and middle-income countries. The current study was conducted to determine knowledge, attitude, and practices related to breast cancer, the associated risk factors, and screening methods in women presenting to a health care facility from resource-poor settings in Pakistan.

METHODS: A cross-sectional study design was used, and participants were recruited phase-wise from three major outpatient departments (OPDs) (Gynecology and Obstetrics OPD, Medical OPD, and Surgical OPD). Data were collected through the validated "Breast Cancer Awareness Measure" developed by Cancer Research UK, King's College London, and University College London in 2009. Data were analyzed through Statistical Package for Social Sciences software (SPSS) version 23.0. Students's T-Test, ANOVA, and linear regression analysis were conducted.

RESULTS: A total of 430 women were invited for participation in the study from the 3 main OPDs, and 400 took part in the study (response rate = 93.02%). The mean age of the women was 33.62 years ± 12.3 years, and the mean years of formal education were 5.05 ± 6.3 years. Less than a quarter of the participants were aware of the breast cancer warning signs, and 23.3% recognized the pain in the armpit or one of the breasts as a sign of breast cancer. The proportion of women aware of age-related and lifetime risk of getting breast cancer was 15.0%. Furthermore, only 2.5% performed breast self-examination at least once a month. Women identified many barriers like embarrassment, transport, and confidentiality issues in seeking medical help.

CONCLUSION: Overall, women had poor knowledge of breast cancer, related warning signs, breast self-examination, risk factors, and screening methods.

KEYWORDS: Breast neoplasms, awareness, signs and symptoms, mass screening, communication barriers

Background

Breast cancer is a global issue that represents a significant public health concern affecting both men and women irrespective of religion, race, ethnicity, or social class.[1] Breast cancer is the most common in women and ranked second after lung cancer.[2] It can occur at any age; however, the incidence is higher in 40 years and above.[3] Worldwide incidence is about 1 384 155 cases per year, in which 60% of the cases are reported from the low and middle-income countries (LMICs).[4-6] The global burden of this disease is expected to increase up to 2 million by 2030.[7] Furthermore, according to World Health Organization (WHO), the incidence of breast cancer in countries of the middle east (ME) will vastly increase in the next 15 years.[8] This increase is mainly attributed to rapid economic change and sudden transition; people of ME change their lifestyle and traditional dietary pattern to a more westernized diet that includes high fat and rich energy food intake; these are important risk factors for breast cancer.[9]

Mortality associated with breast cancer is high; according to GLOBOCAN, 626 679 deaths were reported globally in 2018.[10] However, mortality rates differ between high-income countries (HICs) and LMICs; a profound reduction is noted in the mortality in women of HICs.[1] This reduction in mortality may be attributed to improved mammographic screening and early detection efforts.[11] In contrast, factors like lack of awareness in the public[12] and delayed diagnosis[13] of the disease have been associated with the comparatively higher mortality rates in LMICs.[1]

Early diagnoses and treatment may reduce breast cancer mortality and improve prognosis, and overall outcome of the

disease.[14,15] Public awareness about breast screening methods and early warning signs of breast cancer can help in the early diagnosis of the disease.[16] There are different screening methods, including mammogram,[16] breast self-examination,[17] and breast clinical examination (performed by a trained health care professional) for early detection of breast cancer-related changes.[18]

Unlike the HICs, the LMICs lack proper national screening programs and only offer opportunistic screening programs with access to those who can afford the cost of screening.[1] Literature suggests that improved awareness leads to timely breast screening.[19]

The incidence of breast cancer in women is similar in South Asia and the developed countries.[20] However, breast cancer mortality is higher in women of South Asia[21]; due to lower screening practices, low level of awareness, and insufficient knowledge about breast cancer and screening in South Asian women.[22]

In Pakistan, every ninth woman suffers from the disease, which is the highest incidence rate compared to other South Asian countries.[1,23,24] Approximately 90 000 women develop breast cancer each year, most of them at a younger age.[23,25] About 40 000 women die each year due to breast cancer.[26] However, due to the lack of a national cancer registry in Pakistan, there is insufficient information regarding the incidence and mortality of breast cancer.[16] About 50% to 70% of breast cancer patients present in advanced stages of the disease.

There are very few studies conducted on breast cancer awareness in Pakistan.[27] Due to inadequate research in this area, the prevention of breast cancer is complex. Therefore, the current study was conducted to fill this knowledge gap. The objectives of this study were to determine the level of awareness of women regarding breast cancer, risk factors, and breast screening behaviors. This study will prove helpful in providing baseline information on breast cancer awareness in the area, and the findings should be used as an advocacy tool for policymakers and planners to introduce breast screening and awareness programs in the region.

Methods

Study design

A cross-sectional survey was conducted from November 2017 to April 2018 among women aged 18 years and above. Data were collected from patients coming to the main outpatient departments (OPDs) of a public sector health care facility (Medical Teaching Institute Khyber Teaching Hospital [MTI KTH]) in district Peshawar. MTI KTH is a tertiary-level health care facility and serves the large population of Khyber Pakhtunkhwa.

Participant recruitment

A systematic random sampling technique was used, and participants were selected phase-wise from the three major OPDs (Gynecology and Obstetrics OPD, Medical OPD, and Surgical OPD). During each phase, an equal number of patients were selected at regular intervals from each OPD. Every fifth patient was invited to participate in the study. Patients with a history of breast cancer, critically ill patients, and comatose patients were excluded from the study.

The sample size was calculated by using Open Epi software, taking 95% confidence interval, level of significance 0.05, and assuming 50% prevalence of awareness of breast cancer; the sample size calculated was 384.[28] Assuming a non-response rate of 10%, the final sample size was 430.

Data collection tool

"Breast Cancer Awareness Measure," developed by Cancer Research UK, King's College London, and University College London in 2009, was used for data collection. Validation of the measure was done with the help of Breast Cancer Care and Breakthrough Breast Cancer and was updated on 9 February, 2011.[29] Content validity of the tool is 0.93, and internal consistency is 0.964 by using Cronbach's alpha coefficient.[30]

This measure consists of 7 domains and 40 questions overall. Domain 1 consists of 11 questions regarding warning signs of breast cancer and the responses are mainly yes or no. Domain 2 is related to breast self-examination (BSE) and consists of three questions mainly regarding the frequency of breast self-examination, confidence in noticing a change in the breasts, and consultation of a doctor in case of such change. Domain 3 consists of one question regarding the urgency if a change is noticed in the breasts. Domain 4 is regarding the barriers to seeking medical help and consists of 10 questions in regard to the various barriers like embarrassment, wasting doctors time, difficulty to talk and make an appointment, too busy among others. Domain 5 is regarding the knowledge of age and life time risk of breast cancer and consists of two questions. Domain 6 is about the knowledge of breast screening in the local context and if there is any such program the age and invitation in such programs. The last domain is regarding the risk factors of breast cancer and consists of eight risk factors and the agreement among the participants. These are mainly past history, hormone replacement therapy, being overweight, relative with a breast cancer, having children later in life or not all, early menarche, late menopause, and having less than 30 minutes of moderate physical activity five times a week.

Pilot testing of the measure was done in which 40 women were interviewed, and the tool was found feasible for delivery and understandable by the participants.

Ethical approval was obtained from the ethical review committee of Khyber Medical University (Reference #: DIR/ KMU-EB/BC/000434). Permission was also obtained from the administration of the health care facility. Informed consent was obtained from each participant. Confidentiality was guaranteed, and data were collected by trained female data collectors.

Table 1. Demographic characteristic.

	N	MINIMUM	MAXIMUM	MEAN	STANDARD DEVIATION
Age of the participant in years	400	18	70	33.62	12.30
Years of formal education	400	0	18	5.05	6.25

		FREQUENCY	PERCENTAGE
Marital status	Single	139	34.8
	Married	261	65.2
Employment status	Housewife	288	72.0
	Employed	57	14.3
	Student	55	13.8
Residency	Urban	153	38.3
	Rural	247	61.8

Statistical analyses

Data were analyzed by using Statistical Package for Social Sciences (SPSS) software version 23. Results are presented as frequencies and percentages for categorical variables (marital status, occupation, residence, awareness) and as the mean and standard deviation for continuous variables (age and years of education). Associations between categorical variables were tested using the chi-square test, and a *P*-value of < .05 was considered significant. Responses of participants were converted into two categories. Each correct response of the participant was given a score of one (aware), and an incorrect response was assigned a score of zero (unaware). Each participant's total score was computed by adding correct responses. After that, responses of domain 1 (knowledge of breast cancer symptoms), 5 (knowledge of age-related and lifetime risk), and 7 (knowledge of risk factors) were added, and a new knowledge domain was made, which consisted of a total of 21 questions. Mean knowledge score was compared across different demographic categories using *T*-test and ANOVA as appropriate. Unadjusted and adjusted association of demographic characteristics, with knowledge score, was assessed using linear regression analysis.

Results

A total of 400 women participated in this study (response rate of 93.02%). Demographic characteristics of the women are summarized in Table 1. The mean age of the women was 33.62 ± 12.30 years with a minimum and maximum of 18 years and 70 years, respectively. On average, women attended formal schooling for 5.05 (6.25) years. Around 65.2% of the women were married, and almost 72% were housewives, while 61.8% lived in rural settings.

Responses of participants about the knowledge of warning signs are summarized in Figure 1. Three-fourths of the respondents did not know about warning signs of breast cancer. Pain in one of the breasts or armpits was the most known symptom (23.3%), followed by a change in position of the nipple (19.8%). Pulling in of nipple was the unknown symptom with awareness among 11.3% of the women. More than half of the participants (55.8%) rarely or never do breast checking. Only a fraction of the participants (2.5%) checks their breasts at least once a month. Women's self-confidence in noticing changes in their breasts showed similar results; 51.5% did not know about noticing changes in their breasts, while 2.3% were confident about noticing a change in their breasts. The proportion of women who contact a doctor after noticing changes was (4.0%). The majority (81.8%) of the respondents did not appreciate the urgency of contacting the doctor if they found changes in their breasts compared to only 5.3% who immediately acknowledged the importance of contacting the doctor.

Regarding barriers to seeking medical help, the most commonly acknowledged barrier was an embarrassment to go and see the doctor for breast-related health issues (24.8%). Other reported barriers included being busy (19.5%), being scared of going to the doctor (13.8%), difficulty in communicating with the doctor (13.8%), and being worried about wasting the doctor's time (12.0%). Overall responses about barriers are summarized in Table 2. Approximately one-third of women (32.5%) did not know about age-related risk. In comparison, an even smaller number of participants (15.0%) responded correctly about a 70-year-old woman at a greater risk of developing breast cancer. Likewise, around half of the women (46.8%)
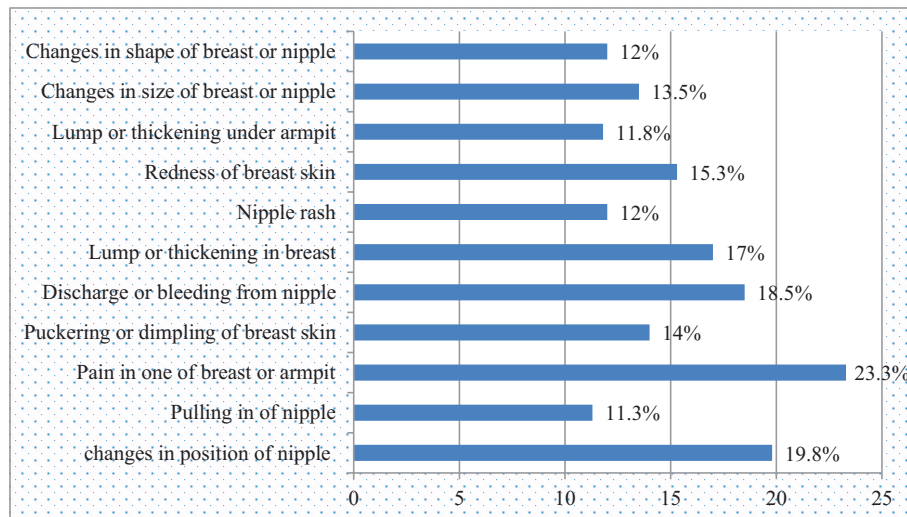
Figure 1. Warning signs of breast cancer.

Table 2. Barriers to seeking medical help.

QUESTIONS	RESPONSES	FREQUENCY	PERCENTAGE
Too embarrassed to go and see the doctor	Yes often	99	24.8
	Yes some-times	82	20.5
	No	136	34.0
	Don't know	81	20.3
	Refused	2	.5
Too scared to go and see the doctor	Yes often	55	13.8
	Yes some-times	83	20.8
	No	156	39.0
	Don't know	100	25.0
	Refused	6	1.5
Worried about wasting the doctor's time	Yes often	48	12.0
	Yes some-times	55	13.8
	No	201	50.3
	Don't know	91	22.8
	Refused	5	1.3
I find my doctor difficult to talk to	Yes often	55	13.8
	Yes some-times	83	20.8
	No	156	39.0
	Don't know	100	25.0
	Refused	6	1.5
Difficult to make an appointment with the doctor	Yes often	32	8.0
	Yes some-times	80	20.0
	No	182	45.5
	Don't know	100	25.0

(Continued)

Table 2. (Continued)

QUESTIONS	RESPONSES	FREQUENCY	PERCENTAGE
	Refused	6	1.5
Too busy to make time to go to the doctor	Yes often	78	19.5
	Yes some-times	66	16.5
	No	144	36.0
	Don't know	104	26.0
	Refused	8	2.0
Too many other things to worry about	Yes often	32	8.0
	Yes some-times	80	20.0
	No	182	45.5
	Don't know	100	25.0
	Refused	6	1.5
Difficult to arrange transport to the doctor's surgery	Yes often	46	11.5
	Yes some-times	53	13.3
	No	183	45.8
	Don't know	109	27.3
	Refused	9	2.3
Worrying about what the doctor might find may stop me from going to the doctor	Yes often	37	9.3
	Yes some-times	52	13.0
	No	196	49.0
	Don't know	103	25.8
	Refused	12	3.0
Not feeling confident talking about my symptom with the doctor	Yes often	40	10.0
	Yes some-times	71	17.8
	No	179	44.8
	Don't know	104	26.0
	Refused	6	1.5

did not know the lifetime risk of breast cancer in a woman, and a smaller proportion (14.8%) answered it correctly as 1 in 9 women have the lifetime risk of getting breast cancer.

Most of the women were unaware of the risk factors associated with breast cancer (Figure 2). History of breast cancer was the most known risk factor (36.3%), whereas early menarche was one of the least known risk factors.

Table 3 illustrates a comparison of the mean knowledge score across various demographic categories. A significant association was found between age group and knowledge (P < 0.001). Knowledge was found higher (4.30 ± 4.29) in the young age group (18-35 years) as compared (1.95 ± 2.63) to old age women (50 years and above). Women with higher

education (College and above) had greater knowledge (6.95 ± 4.14) as compared to primary and below (1.98 ± 2.66).

Association between demographic characteristics and knowledge score was assessed through linear regression analysis (Table 4). Unadjusted analyses showed that women in age groups 36 to 50 and 51 and above had lower knowledge scores, B (*SE*): -1.52 (0.46), P = .001 and -2.35 (0.66), P < .001], as compared to women aged 10 to 35 years. Women living in rural areas and those who were married had lower knowledge scores compared to those living in urban locality and unmarried respectively (B [*SE*]: -1.91 [0.41], P < .001] and -1.07 [0.41], P = .009 respectively). Furthermore, housewives had lower knowledge about breast cancer than employed or students
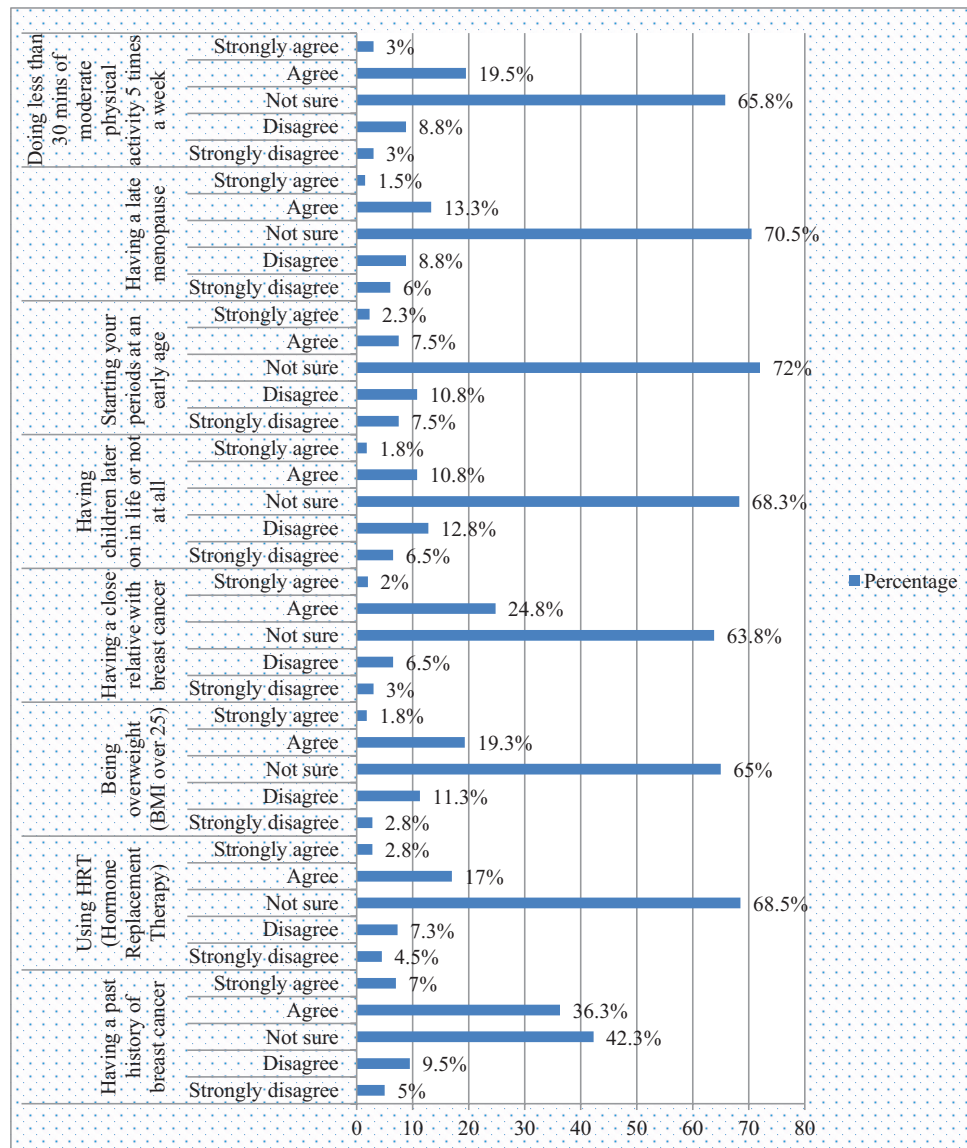
Figure 2. Awareness regarding risk factors of breast cancer.

($P < .001$). Education status of secondary school or higher was associated with a greater knowledge score ($P < 0.001$) compared to an education status of primary school or less ($P < .001$). On adjustment for the potential confounders, higher education and place of residence remained positively associated with greater knowledge levels (P-value: $<.001$ and .03 respectively).

Discussion

We conducted this survey to determine awareness and barriers of women related to breast cancer, its risk factors, and screening methods. Our findings revealed poor awareness in women regarding breast cancer, its risk factors, and screening methods. Results are consistent with previous studies conducted in Bahawalpur Pakistan and Colombo Sri Lanka, which showed poor awareness in women regarding breast cancer.[2,25]

The current study showed poor knowledge among women regarding breast cancer warning signs. Women recognized the pain in the armpit or one of the breasts, change in nipple position, nipple discharge or bleeding, and breast lump or thickening as a warning sign of breast cancer in 23.3%, 19.8%, 18.5%, and 17.0%, respectively. These findings were similar to previous studies' results, which have shown poor awareness regarding warning signs of breast cancer. A study conducted in Eastern China also showed poor awareness as only 23.0% of women recognized nipple discharge as a warning sign of breast cancer.[12]

The knowledge of women regarding breast self-examination (BSE) was very poor, as more than half of the women (55.8%) rarely or never do BSE. A study conducted in Mayo Hospital, Lahore, Pakistan demonstrated that women had very poor knowledge about BSE; most women, 87.7%, had never done breast self-examination.[15] Similarly, a study conducted at Debre Berhan University showed that very few women, 28.3%, had performed breast self-examination.[31]

Table 3. Comparison of mean knowledge score across demographic categories.

	NUMBER	MEAN	STD. DEVIATION	SIGNIFICANCE
Age group				
18-35 years	259	4.30	4.20	<.001
36-50 years	101	2.78	3.50	
51 and above	40	1.95	2.63	
Education				
Primary and below	241	1.98	2.67	<.001
Secondary school	49	4.69	4.18	
College and above	110	6.95	4.15	
Employment				
Housewife	288	2.71	3.38	<.001
Employed	57	5.79	4.10	
Student	55	6.60	4.58	
Residency				
Urban	153	4.34	4.16	.009
Rural	247	3.28	3.83	
Marital status				
Single	139	4.93	4.26	<.001
Married	261	3.02	3.68	

Around one-quarter of the women (24.8%) often feel too embarrassed to go and see the doctor. This is consistent with other studies' findings regarding barriers. A study conducted in Egypt reported that embarrassment is the most common personal barrier for women. More than one-third (39.1%) of the women stated that they feel embarrassed by doctors examining their breasts.[32]

Our results also indicated that women's knowledge about the risk of developing breast cancer was very poor. Only 15.0% of participants were aware of the age-related risk of getting breast cancer, and 14.8% were aware of the lifetime risk of breast cancer. A study conducted in the United Kingdom revealed that only 25.1% of women know about the increased risk of getting breast cancer with age, and 36.7% are aware of breast cancer's lifetime risk.[33]

We also identified that there is no breast screening program in the province, and hence no woman was screened for breast cancer. A study conducted in China reported that 26.8% of women heard about breast screening programs; only 10% have screened for breast cancer among those women. The study also reported that there are no organized regional or national breast screening programs for women in China.[30]

History of breast cancer was the most reported risk factor of breast cancer (36.3%). Around a quarter of women (24.8%) identified breast cancer in a close relative as the risk factor. Knowledge of women regarding Hormone Replacement Therapy, early menarche, late menopause, and obesity being the risk factors were found very poor. A study conducted in the United Kingdom revealed a much larger number of women (90% and 71%) identified family history and previous history of breast cancer, respectively. However, similar low awareness was revealed regarding menarche and late menopause.[34] Another study conducted in Turkey reported that breast cancer's personal history and family history are the most commonly known risk factors (68.7% and 67.0%, respectively); oral contraceptive and late menopause were the two least known symptoms.[35]

In demographic variables, knowledge score was found greater in younger women than older age; these differences may be due to more education in young women. Women with higher education were found more knowledgeable than women with a low level of education or illiterate. In other variables, knowledge was found greater in single women, women living in urban areas, and students. These findings were found similar to a study conducted in Eastern China, which reported that younger women with higher education are found more aware.[12] In contrast, another study conducted in Bahawalpur, Pakistan, showed that old-age women and married women were more

Table 4. Unadjusted and adjusted association between knowledge score and demographic variables.

	UNADJUSTED			ADJUSTED		
	B	SE	P	B	SE	P
Age group						
18-35 years		Ref			ref	
36-50 years	−1.52	0.46	0.001	0.12	0.45	0.8
51 and above	−2.35	0.66	<.001	−.032	.624	0.9
Education						
Primary and below		Ref			ref	
Secondary school	2.71	0.52	<.001	2.82	0.61	<.001
College and above	4.97	0.38	<.001	5.32	0.58	<.001
Employment						
Housewife		Ref			ref	
Employed	3.08	0.53	<.001	−0.79	0.64	0.2
Student	3.89	0.54	<.001	0.62	0.68	0.3
Residency						
Urban		Ref			ref	
Rural	−1.065	0.41	.009	−0.75	0.35	0.03
Marital status						
Single		Ref			ref	
Married	−1.91	0.41	<.001	0.59	0.47	0.2

Abbreviation: *SE*, standard error.

aware.[25] These differences may be due to different geographical locations of studies and cultural differences.

Conclusion

The study findings provided baseline information regarding women's knowledge, attitude, and practices related to breast cancer, its risk factors, and screening methods. Overall, the awareness among women was found very poor. In Pakistan, especially in the study area, that is, Khyber Pakhtunkhwa, women cannot discuss issues related to breasts openly due to cultural sensitivity. Women feel embarrassed and cannot share with their close relatives; thus, most of the women remain undiagnosed and untreated.

There is a greater need to enhance awareness of women regarding breast cancer. Further research is needed in ways to improve women's confidence and reporting within the cultural limitations in the local context. In this regard, both public and private sectors and the healthcare professionals can play an essential role in awareness of women regarding breast cancer, the signs and symptoms, and preventive measures. The current study findings should be used as an advocacy tool for

policymakers and planners to introduce breast screening followed by awareness programs in the country.

Strengths and Limitations

Only a few studies have been conducted in Pakistan on breast cancer awareness. This is a pioneer study conducted in Khyber Pakhtunkhwa province to assess breast cancer awareness in the region. However, due to limited resources and non-availability of funding, we conducted this study in a single tertiary care hospital (Medical Teaching Institute Khyber Teaching Hospital [MTI KTH]). Therefore, caution should be taken before generalizing the results.

Author Contributions

Z.U., M.N.K conceived the idea of this research study and participated in its coordination. Z.U. and Z.U.D. conducted field

research activities and were involved in the data collection, cleaning, and initial analysis. Further analysis was supported by M.N.K. & S.A. All authors contributed toward preparing the first draft as well as editing and reviewing the subsequent drafts. The authors read and approved the final manuscript.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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