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FREQUENCY AND FACTORS ASSOCIATED WITH DELAYED PRESENTATION OF BREAST CANCER AT A TERTIARY CARE HOSPITAL IN PAKISTAN

Original Research

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ABSTRACT

Background: Breast cancer remains one of the foremost causes of cancer-related mortality among women worldwide. Early diagnosis and timely initiation of treatment significantly improve survival rates and reduce disease burden. However, in many low- and middle-income countries, including Pakistan, delayed presentation is common due to a complex interplay of cultural stigma, financial hardship, limited healthcare infrastructure, and inadequate awareness. Understanding these barriers is essential for designing effective strategies to promote early detection and reduce morbidity.

Objective: To evaluate the sociodemographic and clinical factors associated with delayed presentation of breast cancer among female patients at Jinnah Postgraduate Medical Centre (JPMC), Karachi.

Methods: A cross-sectional study was conducted at the surgical wards of JPMC, Karachi, from February 2024 to January 2025. A total of 286 female patients aged 18–60 years, with histopathologically confirmed breast cancer, were enrolled using consecutive sampling. Data were collected via structured in-person interviews, covering sociodemographic details, medical history, and potential delay-related factors. Delayed presentation was defined as a ≥3-month interval between symptom onset and first medical consultation. Data were analyzed using SPSS version 26.0, and chi-square tests were applied to assess associations.

Results: The mean age of participants was 46.57 ± 12.14 years, and the mean BMI was 25.95 ± 3.53. Among all patients, 96 (33.57%) experienced delayed presentation. Statistically significant associations were observed between delayed presentation and educational status ($p=0.03$), family history of breast cancer ($p=0.01$), menopausal status ($p<0.001$), and stage at diagnosis ($p<0.001$). Additionally, reported reasons for delay included visiting alternative healers (40.6%), misperception of non-serious symptoms (27.1%), financial constraints (25.0%), and limited access to healthcare (29.8%).

Conclusion: Delayed presentation of breast cancer was notably influenced by sociodemographic and cultural factors. Targeted awareness campaigns, improved access to healthcare, and community-based education are imperative to promote early diagnosis and reduce breast cancer-related mortality in resource-limited settings.

Keywords: Breast Cancer, Cultural Factors, Delayed Presentation, Diagnosis Delay, Early Detection, Health Accessibility, Socioeconomic Status.

INTRODUCTION

Breast cancer remains the most frequently diagnosed cancer globally, with an estimated 2.26 million new cases reported in 2020, underscoring its significance as a major public health concern (1). It is not only the leading malignancy among women worldwide but also ranks highest in cancer-related mortality among females (2,3). While traditionally considered a disease of high-income countries, more than half of the breast cancer diagnoses and nearly two-thirds of related deaths in 2020 occurred in low- and middle-income countries (4), challenging this outdated notion. In Asia, Pakistan reports the highest incidence rate, where one in nine women is likely to be diagnosed with breast cancer during her lifetime. Alarmingly, a recent study documented 34,066 newly diagnosed cases among Pakistani women alone (5). The increasing prevalence of breast cancer in Pakistan can be attributed to a combination of risk factors such as genetic predisposition, hormonal influences, lifestyle changes, and limited access to early detection and adequate medical services (6). Early detection efforts in Pakistan face significant challenges, particularly due to the absence of a national screening program, limited public awareness, and the widespread neglect of routine breast self-examinations. These issues are compounded by an incomplete National Cancer Registry, making it difficult to accurately assess the true incidence and mortality rates of breast cancer in the country (7,8).

Recognizing the importance of awareness and early diagnosis, the World Health Organization emphasizes that public education is pivotal in improving breast cancer prognosis (9). However, in Pakistan, a large proportion of women present with advanced-stage disease, often after enduring prolonged symptoms without seeking medical attention (10). This delay in presentation is a well-documented issue in many developing nations, where social, cultural, and systemic barriers hinder timely medical consultation (11,12). Various local studies have highlighted these challenges; for instance, in North Pakistan, 39.01% of women presented late, with 40.7% having relied on alternative medicine, 25.2% citing financial constraints, 17.1% being misled by the absence of pain, 10.6% expressing embarrassment, and 6.5% attributing their delay to other factors (13). Another study reported delays ranging from three months to over a year, with 44% of patients delaying care for three to six months, and 23.5% for seven to ten months (8). Such delays not only contribute to more advanced disease at diagnosis but also limit the effectiveness of available treatment options and significantly reduce survival chances. In Pakistan, these delays are often compounded by deeply rooted cultural beliefs, social stigmas surrounding cancer, lack of awareness, and fear of the diagnosis itself. Understanding the complex web of factors that drive delayed presentation is essential for developing targeted interventions to improve outcomes. Therefore, the present study aims to evaluate the determinants associated with delayed presentation among breast cancer patients in Pakistan, with the ultimate goal of informing strategies to promote earlier diagnosis and improve patient prognosis.

METHODS

The present cross-sectional survey was conducted at the surgical wards of Jinnah Postgraduate Medical Centre (JPMC), Karachi, over a 12-month period from February 2024 to January 2025. Using a consecutive sampling method, all female patients aged 18 to 60 years who were strongly suspected of having breast cancer were initially included. These patients were referred to the oncology department for tumor confirmation. Of the 814 women initially suspected, 286 were histopathologically confirmed to have breast cancer and were subsequently included in the final analysis. Cases with benign breast conditions such as cysts, mastitis, ductal ectasia, and phyllodes tumors were excluded during the initial screening to ensure a focused cohort of confirmed malignancies. Ethical approval for the study was obtained from the Institutional Review Board (IRB) of JPMC, with formal written informed consent secured from each participant prior to data collection. Additional permissions were acquired from hospital administration to facilitate smooth access to patient data and interviews. Data were collected using a structured questionnaire administered via face-to-face interviews to ensure clarity and accuracy of responses. The questionnaire comprised sociodemographic variables including medical record number, age, body mass index (BMI), marital status, socioeconomic status, education level, employment status, and residential location. Additional clinical and reproductive variables were recorded, including menopausal status, family history of breast cancer, and use of hormonal contraceptives.

Delayed presentation was defined operationally as a time lapse of at least three months between the patient's initial experience of breast-related symptoms and their first presentation for standard diagnostic evaluation. To assess factors contributing to this delay, the questionnaire explored multiple dimensions, including initial consultation with quacks or alternative healers, misperception of a painless lump as harmless, financial limitations, social stigma or shyness in consulting male physicians, geographical inaccessibility of healthcare providers, and broader cultural or religious barriers. This comprehensive approach was designed to capture both medical and psychosocial contributors to diagnostic delay. Collected data were carefully reviewed for completeness and accuracy prior to entry into a secured electronic database. Statistical analysis was conducted using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were applied to characterize the sample, and frequency distributions were generated to identify the prevalence of various delay-related factors. The findings were categorized to inform clinicians and policymakers about the predominant barriers hindering timely breast cancer diagnosis in the local context.

RESULTS

A total of 286 female patients diagnosed with breast cancer were included in the final analysis. The mean age of participants was 46.57 ± 12.14 years. The majority of individuals (40.56%) belonged to the 51–60 years age group, followed by 35.66% aged between 36–50 years. Regarding body mass index (BMI), the mean BMI was calculated as 25.95 ± 3.53. Most participants (40.91%) fell within the normal BMI range, while 32.87% were overweight, 18.88% obese, and 7.34% underweight. The study revealed that a slightly higher proportion of participants resided in urban areas (52.80%) compared to rural regions (47.20%). A significant majority (65.73%) were married, and 36.36% belonged to the poor socioeconomic class. Around 42.31% were from the middle socioeconomic group, and 21.33% were categorized in the upper class. Concerning educational status, 39.51% had completed primary education, 25.87% had secondary education, 19.23% were educated beyond secondary level, while 15.38% had no formal education. Family history of breast cancer was reported in 48.25% of patients. The left breast was more frequently affected (53.85%) compared to the right (46.15%). Regarding disease staging, 57.69% were diagnosed at stage II, followed by 36.71% at stage III, and 5.59% at stage IV. Additionally, the majority (58.04%) of the patients were premenopausal, while 42.66% were postmenopausal at the time of diagnosis. The study observed that 96 participants (33.57%) experienced a delayed presentation, defined as seeking diagnostic consultation ≥3 months after the onset of symptoms, while the remaining 66.43% reported within three months.

The Chi-square test of association demonstrated statistically significant associations between delayed presentation and several sociodemographic and clinical variables. A significant relationship was found with level of education (p=0.03), where patients with lower educational attainment had higher rates of delay. Similarly, a significant association was observed with family history of breast cancer (p=0.01), menopausal status (p<0.001), and cancer stage (p<0.001), with higher rates of delay among postmenopausal women and those diagnosed at later stages. No statistically significant association was found with BMI (p=0.07), age group (p=0.08), residential status (p=0.12), marital status (p=0.08), tumor laterality (p=0.34), or socioeconomic status (p=0.23). Among the 96 patients who experienced a delay of ≥3 months in seeking medical consultation, several contributory factors were identified through structured interviews. The most commonly cited reason was the preference for visiting alternative healers or quacks (40.6%), followed by a misperception of the breast lump as non-dangerous or non-serious (27.1%). Financial constraints were reported by 25.0% of the delayed patients as a significant barrier to early medical evaluation. Personal discomfort, such as shyness or cultural reluctance to consult male physicians, accounted for 10.4% of the delays. Additionally, unavailability of medical professionals in the vicinity (9.4%) and sociocultural or religious beliefs (8.3%) were also recognized as contributing factors. These findings underscore the multifactorial nature of delayed presentation, reinforcing the necessity for tailored interventions that address not only structural barriers but also deeply rooted social and perceptual factors impeding timely breast cancer diagnosis.

Table 1: Distribution of Participants Based on Sociodemographic Characteristics (n=286)

Sociodemographic Characteristics	n	%
BMI (Mean ± SD) = 25.95 ± 3.53		
Underweight	21	7.34
Normal	117	40.91
Overweight	94	32.87
Obese	54	18.88
Age (Mean ± SD) = 46.57 ± 12.14		

Sociodemographic Characteristics	**n**	**%**
18-35	68	23.78
36-50	102	35.66
51-60	116	40.56
Residential Status		
Rural	135	47.20
Urban	151	52.80
Marital Status		
Unmarried	98	34.27
Married	188	65.73
Socioeconomic Status		
Poor Socioeconomic class	104	36.36
Average Socioeconomic class	121	42.31
Upper Socioeconomic class	61	21.33
Educational Status		
No formal education	44	15.38
Primary	113	39.51
Secondary	74	25.87
More Than Secondary	55	19.23
Family History of Breast Cancer		
Yes	138	48.25
No	148	51.75
Tumor location		
Right Breast	132	46.15
Left Breast	154	53.85
Disease stage		
II	165	57.69
III	105	36.71
IV	16	5.59
Menopausal status		
Post-menopausal	122	42.66
Pre-menopausal	166	58.04

Table 2: Distribution of Participants Based on Delayed Presentation (n=286)

Outcome of the Study	**n**	**%**
Delayed presentation		
Yes ≥3 months	96	33.57
No ≥3 months	190	66.43

Table 3: Chi Square Test of Association between Delayed Presentation and Various Sociodemographic Characteristics (n=286)

Sociodemographic Characteristics	**n**	**%**	**Time of Presentation**		**P-Value**
			<3 months (n=190)	**≥3 months (n=96)**	
BMI (Mean ± SD) = 25.95 ± 3.53					
Underweight	21	7.34	14	7	0.07
Normal	117	40.91	83	34	
Overweight	94	32.87	57	37	
Obese	54	18.88	36	18	
Age (Mean ± SD) = 46.57 ± 12.14					
18-35	68	23.78	47	21	0.08
36-50	102	35.66	72	30	
51-60	116	40.56	71	45	
Residential Status					
Rural	135	47.20	94	41	0.12
Urban	151	52.80	96	55	
Marital Status					
Unmarried	98	34.27	64	34	0.08
Married	188	65.73	118	62	
Socioeconomic Status					
Poor Socioeconomic class	104	36.36	73	31	0.23
Average Socioeconomic class	121	42.31	77	44	
Upper Socioeconomic class	61	21.33	40	21	
Educational Status					
No formal education	44	15.38	28	16	0.03
Primary	113	39.51	74	39	
Secondary	74	25.87	47	27	
More Than Secondary	55	19.23	41	14	
Family History of Breast Cancer					
Yes	138	48.25	85	53	0.01
No	148	51.75	105	43	
Tumor location					
Right Breast	132	46.15	85	47	0.34
Left Breast	154	53.85	105	49	
Disease stage					
II	165	57.69	102	63	<0.001
III	105	36.71	84	21	
IV	16	5.59	4	12	
Menopausal status					
Post-menopausal	122	42.66	68	54	<0.001
Pre-menopausal	164	57.34	122	42	

Table 4: Factors Associated with Delayed Presentation (n = 96)

Delay Factor	**n**	**%**
Visited alternative healers	39	40.63%
Perceived lump as non-dangerous	26	27.08%
Financial constraints	24	25.00%
Shyness/social discomfort	10	10.42%
No doctor availability nearby	9	9.38%
Cultural/religious beliefs	8	8.33%

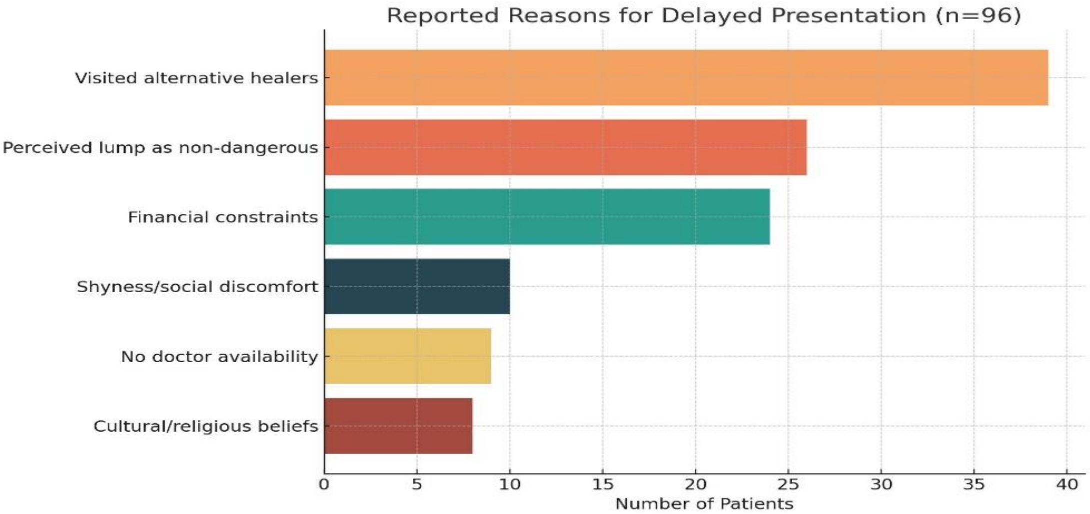

Figure 1 Reported Reasons for Delayed Presentation (n=96)

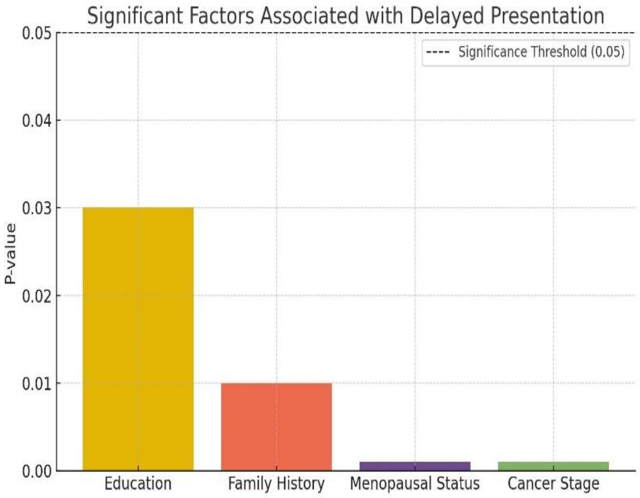

Figure 2 Significant Factors Associated with Delayed Presentation

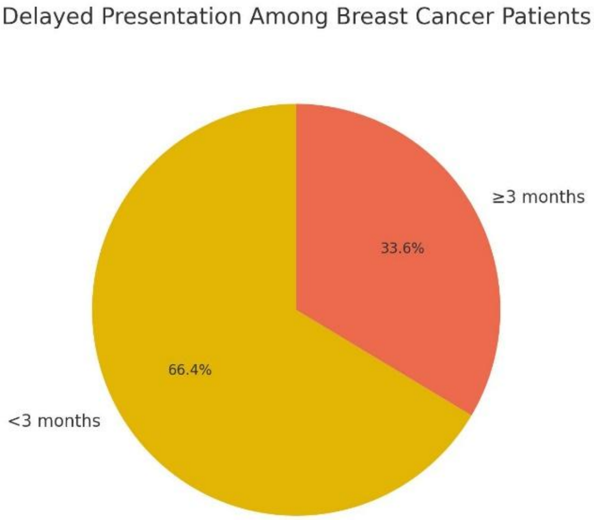

Figure 3 Delayed Presentation Among Breast Cancer Patients

DISCUSSION

The findings of this study underscore the considerable impact of delayed presentation on breast cancer prognosis, therapy outcomes, and long-term survival, consistent with global and regional literature. The observed delay in presentation among 33.6% of participants, defined as seeking medical consultation three months or more after symptom onset, reflects a critical healthcare challenge. These delays were significantly associated with variables such as lower educational status, absence of family history, advanced stage at diagnosis, and postmenopausal status. The high proportion of women presenting with stage III disease further emphasizes the clinical consequence of these delays, consistent with patterns seen in other low- and middle-income countries. Socioeconomic limitations emerged as a pivotal factor contributing to diagnostic delay. Financial constraints remain a consistent barrier, especially among women from low-income families where the cost of consultations, diagnostics, and treatment often outweighs immediate health priorities (14,15). Additionally, healthcare access is predominantly centralized in urban regions, leaving rural populations with logistical and structural obstacles that contribute to prolonged delays in care. These patterns are well supported by previous studies that have highlighted restricted access to healthcare services, particularly in geographically underserved regions (16,17). The implications of these access disparities are compounded by cultural norms and stigma surrounding breast-related health issues. Breast symptoms are often perceived as taboo, leading to concealment and reluctance to seek timely medical intervention (18,19). The current findings also reaffirm the role of health literacy in timely diagnosis. A substantial number of participants misattributed early symptoms to non-threatening causes or remained unaware of the seriousness of a painless breast lump. Lack of awareness, fear of cancer diagnosis, and reliance on alternative therapies continue to dominate the narratives of delayed health-seeking behavior in similar socioeconomic settings. A notable portion of patients in this study reported visiting non-medical healers, reflecting a reliance on traditional or informal care providers which is a recurrent trend reported in local and regional research (20,21). Such behaviors, influenced by both cultural belief systems and healthcare mistrust, severely delay standard diagnostic procedures.

Another important observation was the absence of significant associations between delay and several demographic and clinical variables such as BMI, marital status, and tumor laterality. These findings point toward a more complex interplay of psychosocial and systemic barriers beyond individual characteristics. Fear, cultural shyness, and caregiving responsibilities often supersede personal health concerns among women, particularly in patriarchal societies, adding another layer to delayed presentation. From a methodological perspective, this study benefitted from the use of structured questionnaires and in-person interviews, which enhanced the reliability and depth of data collected. The inclusion of multiple delay-related variables allowed for a broader understanding of the multifactorial nature of late presentation. However, the study also had limitations. Being a single-center study limits the generalizability of findings across other regions of Pakistan. The reliance on patient recall for delay timing introduces the possibility of recall bias. Additionally, while several sociocultural and systemic factors were identified, the psychological dimensions such as denial, emotional resilience, or fear of mastectomy were not explored in depth and warrant further qualitative investigation. Despite these limitations, the study contributes meaningful insight into the socio-behavioral determinants of delayed breast cancer presentation in a resource-constrained setting. The consistency of findings with prior national and international literature strengthens the external validity of the results. Future studies should aim to incorporate multi-center designs, explore longitudinal trends in delay, and develop and evaluate targeted interventions for awareness and early detection. The outcomes support the urgent need for culturally sensitive community education, improved geographic access to healthcare, and integration of low-cost screening and referral systems, particularly in rural and underserved areas. Policymakers must consider these multifaceted barriers when designing breast cancer control strategies, with emphasis on community empowerment and healthcare system strengthening to minimize diagnostic delays and improve survival outcomes.

CONCLUSION

This study concludes that delayed presentation of breast cancer is significantly influenced by educational attainment, socioeconomic conditions, family history, menopausal status, and stage at diagnosis. Contributing factors such as lack of awareness, reliance on alternative therapies, financial limitations, and inadequate access to healthcare highlight the urgent need for targeted interventions. Strengthening early detection strategies through patient education and community engagement is essential. Breast surgeons can play a pivotal role by actively counseling women at risk and collaborating with national organizations to promote breast health awareness. These collective efforts can help reduce delays, improve timely diagnosis, and ultimately enhance treatment outcomes and survival rates.

AUTHOR CONTRIBUTION

Author	Contribution
Asghar Ali*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Zahid Mehmood	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Mariyah Anwar	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Shahzeb	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Salma Khatoon	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Muhammad Azeem	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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