Science Letters ISSN 2345-5463 DOI: https://doi.org/10.47262/SL/13.1.132025140

Research article
2025 | Volume 13 | Issue 1 | Article ID 1325140sl

ARTICLE INFO

Received
February 08, 2025
Revised
April 09, 2025
Accepted
April 12, 2025
Published
May 10, 2025

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Keywords
Breast Cancer
Family history
Life style
Prevalence
Risk factors

How to Cite
Naz S, Dar Z, Sajjad E, Sharif S, Rashid F. Preponderance of breast cancer in the population of Lahore, Pakistan. Science Letters 2025; 13(1):1325140sl

Open Access

Preponderance of Breast Cancer in the Population of Lahore, Pakistan

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Abstract

Breast cancer is a prevalent and life-threatening malignancy that primarily affects women worldwide. The study focused on finding the preponderance of breast cancer in Lahore. A sample of a total of 200 females was collected from two of the public hospitals; Sir Ganga Ram Hospital and Mayo Hospital in a time span of three months from March 2024 to May 2024. The age range of patients was from the age below 20 to above 50. The information was collected in the form of a questionnaire and face-to-face interview. Different factors that were thought of causing breast cancer by extensive literature review were included in the questionnaire like age, marital status, socioeconomic status, education level, menstrual history, parity, duration of breastfeeding, mode of childbirth, family history, and lifestyle factors like obesity and smoking. Out of 200 females, 49 (24.5%) were found to be diagnosed with breast cancer. The age of menopause, mode of childbirth, family history, and smoking were found to be statistically significant when categorized by the number of breast cancer patients. These findings highlight the need for early detection and targeted prevention strategies to help lower breast cancer prevalence and enhance patient outcomes.

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Introduction

Breast cancer is among the most commonly diagnosed cancers and remains the leading cause of cancer-related mortality in women worldwide. In 2022, the World Health Organization (WHO) reported approximately 2.3 million new cases and 670,000 deaths globally [1]. Breast cancer can affect both men and women, however, women bear the overwhelming burden, with only 0.5– 1% of cases resulting in death among men [2]. Breast cancer is the most prevalent cancer among women in 157 of 185 countries, highlighting its global dominance as a significant public health concern [3]. The rising preponderance of breast cancer varies between high-income and low and middle-income countries (LMICs). While many high-income countries report stable or declining incidence rates due to early detection programs and advanced healthcare systems, LMICs face a growing burden due to changing lifestyles, insufficient healthcare infrastructure, and late-stage diagnoses [4]. In these regions, limited access to diagnostic, and treatment facilities contributes significantly to the increasing breast cancer incidence and mortality [5].

Pakistan, one of the highest breast cancer mortality rates in Asia, presents an example of the growing preponderance of breast cancer in LMICs [6]. One in nine women in Pakistan will develop breast cancer in their lifetime, with urban centers like Lahore facing particularly high rates [7]. In 2023, breast cancer was reported for nearly 43% of all cancer cases among women over 18 at Shaukat Khanum Memorial Cancer Hospital and Research Centre, highlighting its prevalence presence in the region [8]. The preponderance of breast cancer in Lahore is influenced by several risk factors, including age, gender, reproductive health, socio-economic status, education, genetics, smoking, and obesity [9]. Despite the severity of the situation, the city's healthcare infrastructure remains under-resourced, with disparities between public and private healthcare sectors limiting access to critical diagnostic services like mammography [10].

This research aims to investigate the major risk factors contributing to the high preponderance of breast cancer in Lahore. This study focuses on offering a holistic understanding of breast cancer trends in the city. Of the 200 women, 49 (24.5%) were diagnosed with breast cancer. Statistically significant associations were found between breast cancer prevalence and factors such as the age of menopause, mode of childbirth, family history, and smoking status. Given the global and regional burden of breast cancer, understanding its preponderance in Lahore is critical for developing effective public health interventions. This research has the potential to influence policy, improve early detection practices, and enhance treatment adherence, ultimately contributing to reduced mortality rates and improved health outcomes for women in the region.

Materials and Methods

The study was conducted in public hospitals in Lahore, Pakistan. This study was conducted over a period from March 2024 to May 2024 among people visiting public hospitals like Sir Ganga Ram Hospital, Lahore, and Mayo Hospital, Lahore. There were 200 female patients aged below 20 years to over 50 years who were willing to participate in the survey. Participants were selected through convenience sampling.

Questionnaire design and interview

The questionnaire used in this study was developed based on a comprehensive review of existing literature on breast cancer risk factors, with a focus on demographic characteristics, female physiology and reproductive factors, and lifestyle behaviors. Those patients who were unable to read and fill in the information properly were interviewed by the researcher in simple terms.

Survey variables and ethical considerations

The demographic factors, including age, marital status, education status, and socioeconomic status; female physiology and reproductive factors, including menstrual history, age at menarche, age at first childbirth, parity, breastfeeding practices, and age of menopause; family history, including the presence of breast cancer in the family and lifestyle factors, including smoking habits and obesity were considered as survey variables. The data collected is confidential and was only used for this research-based survey project. Participants were provided with detailed information about the study objectives and procedures, and informed consent was obtained before data collection.

Statistical analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 23. Qualitative variables were summarized as frequencies and percentages. Bivariate analyses,

including chi-square tests, were performed to assess associations between different risk factors and breast cancer occurrence. A significance level of $p<0.05$ was considered for statistical significance.

Results

The data were collected from 200 female patients who visited public hospitals in Lahore, such as Mayo and Sir Ganga Ram, for three months. The sample included a diverse representation of demographic, reproductive, and lifestyle characteristics to explore the prevalence and risk factors of breast cancer.

Table 1 Comparison between breast cancer and family history using chi-square test.

Breast cancer	Family history (Yes)	Family history (No)	*p*-value
Yes	12 (6.0%)	37 (18.5%)	0.045
No	19 (9.5%)	132 (66.0%)	0.045

Demographic factors

The age distribution of participants showed that 10 (5%) were below 20 years, 12 (6%) were aged 21–30, 23 (11.5%) were 31–40, 85 (42.5%) were 41–50, and 70 (35%) were above 50. Among these, 49 (24.5%) were diagnosed with breast cancer. Regarding marital status, 175 (87.5%) were married and 25 (12.5%) were unmarried. In terms of education, 58 (29%) were illiterate, 61 (30.5%) had primary education, 65 (32.5%) had secondary education, and 16 (8%) had higher education. The income levels were also varied among participants, including 34 (17%) earned below 10,000 PKR, 58 (29%) earned 11,000–20,000 PKR, 54 (27%) earned 21,000–30,000 PKR, 32 (16%) earned 31,000 – 40,000 PKR, and 22 (11%) earned more than 40,000 PKR. Chi-square analysis showed no statistically significant association between breast cancer prevalence and age ($p = 0.334$), marital status ($p = 0.291$), education ($p = 0.486$), or socioeconomic status ($p = 0.954$).

Family history

Among the participants, 31 (15.5%) reported a family history of breast cancer. A statistically significant association was found between family history and breast cancer prevalence ($p = 0.045$), indicating that women with a family history were more likely to be diagnosed (Table 1).

Reproductive health factors

Regarding menstrual history, 48 (24%) patients reported menarche at 11 years or younger, 50 (25%) at age 12, 40 (20%) at 13, and 62 (31%) at 14 or older. Menopause data showed that 37 (18.5%) had not reached menopause, 40 (20%) reached menopause before 45, 63 (31.5%) between 45–50, and 60 (30%) after 50. Incomplete pregnancies were reported by 27 (13.57%) with one, and 26 (13.07%) with more than one. Regarding the delivery type, 16 (8%) patients had no children, 24 (12%) had normal deliveries, 92 (46%) had C-sections, and 26 (13%) had both. Regarding breastfeeding duration, 24 (12%) patients breastfed less than 6 months, 72 (36%) breastfed 7–12 months, 62 (31%) breastfed 13–18 months, and 14 (7%) breastfed more than 18 months. No significant association was found with age at menarche ($p = 0.513$) or breastfeeding duration ($p = 0.184$). However, the age of menopause ($p = 0.020$) (Table 2) and type of delivery ($p < 0.001$) (Table 3) showed significant associations with breast cancer prevalence.

Table 2 Comparison between breast cancer and age of menopause using chi-square test.

Menopause	Not reached	<45 years	45-50 years	>50 years	*p*-value
Yes	9 (4.5%)	19 (4.5%)	17 (8.5%)	4 (7.0%)	0.020
No	44 (21.1%)	30 (15.6%)	48 (23.1%)	29 (23.0%)	0.020

Table 3 Comparison between breast cancer and mode of childbirth using chi-square test.

Mode of childbirth	Zero children	Normal	C-section	Both
Yes	8 (4.0%)	6 (3.0%)	27 (13.5%)	8 (4.0%)
No	26 (13.0%)	65 (32.5%)	42 (21.0%)	18 (9.0%)

Lifestyle factors

Of the total, 10 (5%) patients were active smokers, 42 (21%) were exposed to passive smoking, and 148 (74%) were non-smokers. Obesity was reported in 56 (28%) patients. A statistically significant relationship was observed between smoking and breast cancer (p = 0.008) (Table 4), while no significant association was found with obesity (p = 0.230).

Table 4 Comparison of breast cancer and smoking using chi-square.

Smoking	Yes	No	Passive smoking	*p*-value
Yes	4 (2%)	28 (14%)	17 (8.5%)	0.008
No	6 (3%)	120 (60%)	25 (12.5%)	0.008

Discussion

This study explored the prevalence and associated risk factors of breast cancer among women in Lahore, highlighting both expected and novel findings. Although a higher number of breast cancer cases were observed among women aged 41–50 years (28.2%) and those over 50 (25.7%), age did not show a statistically significant association (p = 0.334). This aligns with global trends indicating increasing breast cancer risk with age, especially after menopause, though the lack of significance may stem from sample size or regional factors [11]. Similarly, marital status, educational level, and socioeconomic status were not significantly associated with breast cancer prevalence. These findings suggest that while these factors may influence healthcare access, they might not directly affect breast cancer risk in this population [12]. A significant association was found with family history (p = 0.045), reinforcing the role of genetic predisposition, such as BRCA mutations [13], in breast cancer development. Additionally, late menopause (p = 0.020) was associated with increased risk, consistent with the understanding that prolonged estrogen exposure contributes to carcinogenesis [14]. A striking finding was the significant association between delivery type and breast cancer (p < 0.001), with higher risk among women who had C-sections. Although the biological rationale is unclear, this correlation suggests that further studies are needed to explore hormonal or lifestyle differences among women undergoing different delivery methods. No significant association was observed between age at menarche or breastfeeding duration and breast cancer prevalence, though existing literature suggests these factors could influence risk when considered over a larger or more diverse population [15]. Smoking emerged as a significant risk factor (p = 0.008), echoing evidence that tobacco exposure introduces carcinogens that can initiate or exacerbate breast tissue abnormalities [16]. Interestingly, obesity did not show a statistically significant association (p = 0.230) in this study, despite its established role in postmenopausal breast cancer [17]. This may be attributed to confounding factors such as diet, activity levels, or unmeasured hormonal variables. Future research should aim to explore these lifestyle factors in greater detail using multivariate analyses.

Conclusion

A recent study shows that out of 200 total female patients, 49 patients were diagnosed with breast cancer. The most common symptom found in 49 breast cancer patients was a lump around the breast or armpit, with a frequency of 61.2%. Family history, age of menopause, mode of childbirth, and smoking were significantly affecting breast cancer prevalence. These insights can inform targeted interventions and public health strategies aimed at reducing the breast cancer burden in Lahore and similar areas.

Acknowledgments

We are thankful to the patients who provided us with the relevant data. We extend our gratitude to the hospital staff for their valuable cooperation.

Conflict of Interest

The authors had no conflicts of interest to disclose.

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