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Breast Lump Patterns Across Different Age Groups Among Female Patients Presenting to Surgical Outpatient Department of a Tertiary Care Hospital in District Malir Karachi

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ABSTRACT

The number of patients presenting with different types of breast lumps has been on the rise in the Malir district. Many females are being diagnosed with breast cancer. **Objectives:** To determine the pattern of breast lumps in different age groups in the outpatient department of Al-Tibri Medical College hospital in District Malir, Karachi. **Methods:** It was a descriptive cross-sectional study conducted at the Department of General Surgery, Al-Tibri Medical College Hospital, Karachi, from 1st November 2022 to 31st October 2024. Patients presenting in the Surgical Outpatient Department with breast lumps were included in the study. Age at presentation, symptoms, clinical features, investigations, biopsy reports, and operation notes (if operated) were recorded and submitted for analysis. **Results:** The commonest lesions were fibro-adenoma (33.6%), inclusion cyst of the breast (19%), and breast abscess (18.5%), followed by Carcinoma breast (17.7%). 51.7 % of cases were associated with pain. Among carcinomas, 43% presented with pain. The highest peak of presenting with malignant lesions was from 39 to 43 years, and 2nd peak was from 49 to 58 years. Most benign lesions presented between 24 to 28 years. The chi-square test showed a strong association between age range and pain (p-value<0.001), age range and type of lump (p-value <0.001), and marital status and type of lump (p-value<0.001). **Conclusions:** It was concluded that fibro-adenoma is the most common breast disease. Inflammatory lesions are also present frequently in the reproductive age group. Carcinoma breast presented in middle and later age groups, predominantly in married females in our district.

INTRODUCTION

The human breast is subjected to constant physiological changes throughout life, secondary to changes in hormone levels, throughout the menstrual cycle, during pregnancy, lactation, and menopause. These changes may give rise to non-proliferative and proliferative breast lesions [1, 2]. Around 2 million patients were diagnosed with breast cancer worldwide in 2018, associated with half a million deaths [3]. It is the most common cancer in females and the second most common cause of cancer-related death. It was found to be most prevalent in developed countries as compared to developing or underdeveloped countries, but now incidence is reported to be rising in low- and middle-income countries as well [3]. Considering breast cancer, a global concern, more localized and regional data on breast cancer prevalence in low and middle-income countries is needed because the incidence and outcomes of this cancer vary greatly depending on socioeconomic, geographical, and cultural factors. In most low- and middle-income countries, due to financial and cultural constraints, disease is diagnosed at a later stage, leading to poorer outcomes. For better outcomes, it is essential to identify the disease burden correctly to ensure better

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resource allocation for the prevention, diagnosis, and treatment of breast cancer [4]. Breast cancer incidence peaks in post-menopausal women, while benign diseases primarily manifest in women of reproductive age, culminating in the second or third decade [5, 6]. The incidence of various breast lump types in women varies with age [5]. Early identification and prompt diagnosis are essential for prompt management, particularly in setups with limited resources. Understanding the patterns of breast lumps across various age groups can assist with improving diagnostic techniques, patient counselling, and treatment because age is a significant factor in determining whether a lump is benign or malignant [5]. Risk factors associated with malignant tumors include age, family history, early menarche, late menopause, age >35 at first childbirth, proliferative breast pathologies, obesity, hormonal therapy, Breast Cancer (BRCA) mutation, lobular carcinoma in situ, and radiation exposure [7]. Benign lumps can be secondary to infective conditions, inflammatory lesions, benign cysts and tumors. Histologically, they are divided into non-proliferative lesions and proliferative breast lesions with or without atypia [8]. Proliferative lesions are associated with a small increased risk of carcinoma [9]. Fibroadenoma is the most common of all the lumps and usually presents in the second and third decades of life with no risk of malignant conversion [10]. Small lesions, if confirmed via investigation, usually do not require surgery. Surgery may be associated with architectural distortion and damage to ducts [11]. Breast lumps are a common concern among females of all ages, with causes ranging from benign to malignant conditions. While there is extensive research on different aspects of breast cancer, there is still limited data available on the overall pattern of breast lumps across different age groups, especially in resource-limited setups. With age being a key determinant in breast lumps, studying their distribution will help in the better understanding of common breast lumps in different age strata. It will result in the early identification of high-risk cases and will guide healthcare professionals in prioritizing diagnostic approaches based on patient demographics.

Despite extensive literature on breast cancer and benign breast diseases, there is limited region-specific evidence from resource-constrained Pakistani populations regarding the age-wise distribution and clinicopathological patterns of breast lumps. In District Malir, Karachi, where socioeconomic and healthcare access factors may influence delayed presentation, the overall burden and variation of benign versus malignant breast lumps across age groups remain underexplored. This gap restricts early risk stratification, targeted awareness, and age-appropriate diagnostic planning. This study aims to determine the pattern of breast lumps presenting in different age groups in the outpatient department of Al-Tibri Medical College Hospital, a tertiary care hospital situated in District Malir, Karachi. This study provided age-based trends and contributed to evidence-based decision-making for clinicians to improve patient outcomes and awareness. It also provided the basis for future data, generating insight among healthcare professionals.

METHODS

A descriptive cross-sectional study was conducted at the Department of General Surgery, Al-Tibri Medical College Hospital, Karachi, Pakistan, after obtaining approval from the Institutional Ethical Review Committee. No. ATMC/IERC/12th/02-2022/01. The study period spanned from November 2022 to October 2024. All female patients (n=271) presenting to the Surgical Outpatient Department with breast lumps during the study period were included. All patients not willing to be a part of the study, all patients previously operated on for breast lumps, as that can hinder clinical findings and patients on hormonal therapy, were excluded from the study. Informed consent was obtained from all patients. Patients from 13 to 80 years of age were included. All the patients were residents of the Malir District. All patients complained about a breast lump for any duration, with or without associated pain of any duration, with or without nipple discharge, in any quadrant of the breast, any size, shape, or consistency of lump, with or without axillary lymph nodes. The skin was examined for any redness, dimpling, or peau d'orange appearance, especially in painless lumps. Palpation findings (including characteristics of any palpable masses). An assessment of regional lymph nodes was performed. A triple assessment was used to make the diagnosis of the lump. History and clinical examination, radiology consisting of ultrasound for females aged <40 and mammogram and ultrasound for females more than 40 years of age were used. For Birad 4 and 5, trucut biopsy or excisional biopsy was undertaken, and benign and malignant lumps were separately categorized [12]. In the case of indeterminate lesions, guidelines by NCCN were followed for further imaging, repeat biopsy, or excisional biopsy [13]. Patients with fibrocystic breast disease and fibroadenomas of less than 2cm were counselled, and those with mastitis were treated conservatively with antibiotics. Breast abscesses and inclusion cysts were operated on. Malignant cases were either operated upon or went to other centers for treatment. Inoperable breast cancers were referred to a medical oncologist. The data were analyzed using SPSS version 26.0. Age parameter was further categorized to create various age ranges (Teenage=13-19, Twenties=20-29, Thirties=30-39, Forties=40-49, Fifties=50-59, Sixties=60-69, Seventies=70-79 and Eighties=80-89).

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Descriptive statistics were applied to determine frequencies and percentages for categorical variables. The chi-square test was applied to check the association between age range, pain, and type of lump, and between marital status and type of lump.

RESULTS

The mean age of patients was 33.9 years (S.D ± 12.66) with an age range of 13-80 years (Table 1).

Table 1: Frequency Distribution of Demographic and Other Variables (n=271)

Baseline Characteristics	Categories	n (%)
Mean Age	33.9 ± 12.66 Years	
Marital Status	Married	203 (74.9%)
	Unmarried	67 (24.7%)
Age Distribution	Teens	21 (7.7%)
	The Twenties	97 (25.8%)
	The Thirties	75 (27.7%)
	The Forties	40 (14.8%)
	The Fifties	22 (8.1%)
	The Sixties	12 (4.4%)
	The Seventies	3 (1.1%)
	The Eighties	1 (0.4%)
Type of Lesion	Fibro-adenoma	91 (33%)
	Galactocoele	1 (0.36%)
	Abscess	50 (18%)
	Fibrocystic Disease	11 (4%)
	Sebaceous Cyst	52 (19%)
	Malignant Mass	48 (17.7%)
	Undetermined	18 (6%)
Family History of Breast Cancer	Family History of Breast Cancer Present	10 (3.7%)
	No Family History Of Breast Cancer	260 (92.3%)
Pain	Present	139 (51.2%)
	Absent	132 (48.8%)

Among the patients, 74.9% were married and 24.7% were unmarried. Most of the patients presented in their twenties and thirties. Most of the cases presented were benign lumps, 199 (73%), 48 (17.7%) were malignant, and 18 (6%) were indeterminate. The commonest benign lesion was fibro-adenoma accounting for 91 (33%) patients, 1 (.36%) had galactocele, 52(19%) sebaceous cyst, 50(18%) had breast abscess, 48(17.7%) had a malignant mass, 11(4%) had a fibrocystic disease, and 18 (6%) cases were undetermined. Only 10 (3.7%) cases had a family history of breast cancer, while 260 (92%) cases had no family history of breast cancer. In 51% of cases lump was painful, while 48.8% of lumps were painless (Figure 1).

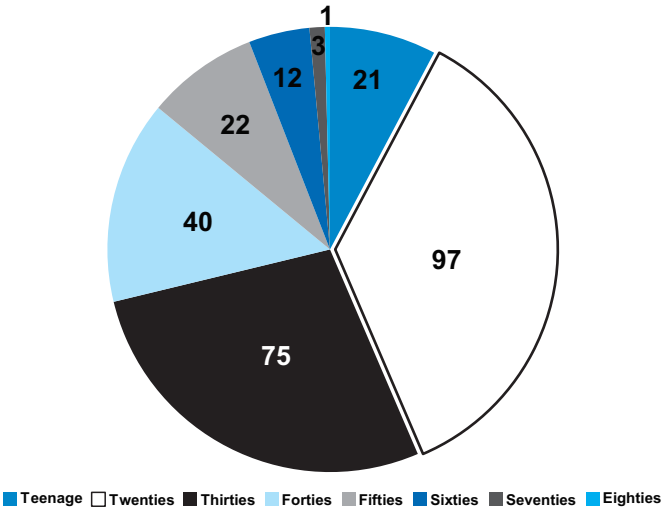

Figure 1: Frequency and Percentages of Patients in Various Age Groups

Figure 1 shows most of the patients (71.2%) presenting with breast lumps were less than 40 years of age. Only 27.8% of total patients with breast lumps were 40 years and above. A comparison of various parameters was done to check the association of different categorical parameters in different age groups (Table 2).

Table 2: Comparison of Age Range of Patients with Breast Lumps and Their Marital Status

Age Range	Marital Status			p-Value
	Married	Unmarried	Unknown	
Teenage	3	18	0	<0.001*
Twenties	59	38	0	
Thirties	66	8	1	
Forties	37	3	0	
Fifties	22	0	0	
Sixties	12	0	0	
Seventies	3	0	0	
Eighties	1	0	0	

*Level of significance was at <0.05. p-value was generated by Pearson's Chi-square test.

Comparison of the age range of patients with their marital status shows a statistically significant relationship between the two parameters (Table 3).

Table 3: Distribution of Patient Age Range and Types of Breast Lumps

Age Range	Fibro-adnoma	Galactocoele	Abscess	Fibrocystic Disease	Sebaceous Cyst	Malignant Mass	Undetermined	Chi-Square Value	p-Value
Teenage	15	0	2	1	2	0	1	159.51	<0.001*
The Twenties	52	0	25	4	13	1	2		
The Thirties	21	1	18	4	19	8	4		
The Forties	3	0	3	1	14	16	3		
The Fifties	0	0	2	0	3	13	4		

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The Sixties	0	0	0	1	1	7	3		
The Seventies	0	0	0	0	0	2	1		
The Eighties	0	0	0	0	0	1	0		
Total	91 (33%)	1 (0.36%)	50 (18%)	11 (4%)	52 (19%)	48 (17.7)	18 (6%)	-	-

*Level of Significance was at <0.05. p-value was generated by Pearson's Chi-square test.

Among benign lesions, fibro-adenoma (33%) was seen mostly in teens and twenties and was rarely present after thirties. This was followed by infective and inflammatory lesions of the breast, which are more commonly seen in the twenties and thirties. There were (18%) cases of breast abscess and mastitis, and these patients mostly belonged to the third decade of life. Fifty-two cases (19%) had infected sebaceous cysts of the breast presenting in their twenties, thirties, and forties, while 11 patients had fibrocystic disease of the breast. The rate of malignant disease was 17.7%. Malignancies were predominantly seen in the forties (16 cases) and fifties (13 cases) groups. Out of 18 indeterminate cases, 6 patients had indeterminate trucut biopsy reports and refused open biopsy, and 12 had clinically suspicious lesions with BIRAD 3 lesions on a mammogram, refusing trucut/open biopsy. Undetermined cases were spread in all age groups (Table 4).

Table 4: Association Between Patient Age Range and Presence of Pain in Breast Lumps

Age Range	Pain		Chi-Square Value	p-Value
	Present	Absent		
Teenage	5	16	26.68	<0.001*
Twenties	47	50		
Thirties	46	29		
Forties	30	10		
Fifties	7	15		
Sixties	3	9		
Seventies	2	1		
Eighties	0	1		

*Level of significance was at <0.05. p-value was generated by Pearson's Chi-square test

Among benign lesions, most fibro-adenomas were painless, and infectious lesions were painful. Forty-eight percent of malignant lesions were painful, and the rest were painless. Most painful lumps presented in their twenties, thirties, and forties. The chi-square test also revealed that there was a statistically significant association between age group and presentation of pain and lump (p-value<0.001). Similarly, there was a strong association between marital status and the type of lump (p-value<0.001). Most cases of fibro-adenomas were diagnosed in unmarried patients. The rest of the pathologies were found in married patients with a predominance of breast abscess (49 cases), followed by malignancy (48 cases) and sebaceous cyst of the breast (40 cases) (Table 5).

Table 5: Association between Marital Status and Type of Breast Lump

Marital Status	Fibro-adnoma	Galactocoele	Abscess	Fibrocystic Disease	Sebaceous Cyst	Malignant Mass	Undetermined	Chi-Square Value	p-Value
Married	44	1	49	8	40	48	13	70.115	<0.001*
Unmarried	47	0	1	3	11	0	5		
Unknown	0	0	0	0	1	0	0		

*Level of significance was at <0.05. p-value generated by Pearson's Chi-Square Test

DISCUSSION

The most common presenting symptom of breast disease is mastalgia, followed by a breast lump. The presence of a breast lump in females evokes anxiety. These lumps can be benign or malignant. Most lumps are benign and can be caused by infections, inflammation, trauma, or benign tumors [12]. In the current study, benign breast lumps were common in the reproductive age group, especially in the third and fourth decades of life. In the present study, the age of patients was from 13-80 years with a mean age of 33.9 years. A study by Gradishar *et al.*, shows its age range from 18 to 75 years with a mean of 37.72 years [13]. In the current study, 73% of cases were benign lesions, with most presenting in their twenties and thirties, while 17.8% were malignant and were mostly present in their forties and fifties. These results are close to the study by Al-Basha, where benign lesions were 81.5% and malignant lesions were 18.5% [14]. A recent Pakistani study by Abbasi *et al.*, also presented the same results with benign lesions at 80.35% and malignant lesions at 19.65% [15]. In another Pakistani study by Ahmed *et al.*, malignant lesions were present in 31.6% of cases of palpable breast masses of females of more than 30 years of age [16]. In another Pakistani study, the researcher mentioned the incidence of malignant breast lumps as 30% in histopathological samples [17]. The literature shows that among benign breast diseases, the most common lesion is fibro-adenoma. It usually presents in the late teens and early twenties and is rare after 40 [18, 19]. In current study also had 33% cases of fibro-adenoma mostly in teens and twenties, in contrast to a study by Fauzia *et al.*, where the

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incidence of fibro-adenoma was 47.1% but similar to current study presented in twenties and thirties [19] and another Pakistani study showed 42.4% incidence of fibro-adenoma [20]. Another benign lesion was breast abscess, present in 18% of the present cases, while a study conducted at a tertiary care hospital in Karachi showed an incidence of 12.8% cases of breast abscess [19]. We had a high incidence of sebaceous (epidermoid inclusion) cysts of 19%, and they presented in the second, third, and fourth decades, as opposed to Memon *et al.*, where it was 1.42% only [21]. Only 4% of current patients presented with fibrocystic disease of the breast, and a Pakistani study shows this incidence to be 11.6% [22], but the result coincides with the result of the study by Yadav, whose study also shows an incidence of 4% for fibrocystic disease of breast [23]. In the current study, 17.7% of cases were malignant and were mostly present in the forties and fifties, which is comparable to a study by Memon *et al.*, with an incidence of 17.9% [21]. A review of the prevalence of breast cancer in Pakistan by Nazuk *et al.*, shows an extremely high incidence of breast cancer in Pakistan, 21.5% and 34% of all female cancers, which is the highest in Asia after Israelite Jews [24]. The current study shows 6.6% cases of indeterminate lesions. The indeterminate breast lesions found on core biopsy include atypical papilloma, atypical ductal/lobular hyperplasia, and radial scar/complex lesions. As the core biopsy sample is not representative of the whole lesion, it requires a diagnostic open biopsy due to uncertain malignant potential and association with DCIS or invasive carcinoma. Tan *et al.*, present a malignancy upgrade of 0.66% in their study discussing the significant waste of resources on open biopsy for B3 lesions. They advocate the use of targeted core biopsy or stereotactic biopsy to help reduce the burden of open biopsies. Management of indeterminate lesions is still a dilemma with the need to tailor the management decisions from case to case, thus requiring more research to guide clinical management [25]. In the present study, after clinical assessment, we utilized ultrasound for imaging for patients under 40 years of age and mammogram along with ultrasound as an adjunct for patients more than 40 years of age, except for patients with epidermoid cysts, which was a clinical diagnosis. For histopathology, we used trucut biopsy for all BIRAD 4 and 5 patients, and selective BIRAD 3 patients and used excision biopsy in patients with either a benign lump (for treatment purposes) on ultrasound or an indeterminate lesion if found on trucut biopsy. Radiological evaluations, including mammography, ultrasound, and contrast-enhanced magnetic resonance imaging (MRI), are used for early detection of Breast cancer, to classify the lesion, and to predict its aggressiveness for personalized treatment [26]. Mammography has limitations in dense breasts, making ultrasound valuable for women under 40. Dynamic contrast-enhanced MRI and contrast-enhanced spectral mammography offer better results. Image-guided percutaneous biopsies are less invasive and quicker than surgical biopsies, with vacuum-assisted biopsies even potentially curative for small lesions [27]. Moreover, using AI to detect indeterminate lesions can be invaluable [28]. The current study showed a strong association between marital status and the presence of malignancy. This contrasts with previous literature citing higher breast carcinoma incidence in unmarried female [28]. This aspect needs to be further investigated in detail regarding the reason for the higher incidence of breast carcinoma in married females in Pakistan as opposed to the rest of the world. Factors such as general awareness, behavior patterns of married females towards their health, their dietary and lifestyle modifications after marriage, and hormone receptor status need to be considered that may be contributing towards the higher incidence in the present community.

This study was limited by its single-center cross-sectional design, relatively small sample size, and reliance on outpatient hospital-based data, which may reduce generalizability to broader populations. The exclusion of hormonal, genetic, reproductive, and long-term outcome factors further limits deeper risk analysis. Future multicenter longitudinal studies with larger representative samples are recommended to explore broader epidemiological determinants, incorporate advanced diagnostic modalities, and better understand sociocultural and biological contributors to breast lump patterns and malignancy risk in Pakistani women.

CONCLUSIONS

Fibro-adenomas are the most common breast lesions in District Malir, Karachi, with inflammatory lesions the next frequently occurring lesions seen in women of reproductive age. Malignant breast lumps primarily affect women in their fifth and sixth decades. Age is a key determinant in the type of lesion a female present with. The high incidence of malignancy, particularly among married women in their forties and fifties, emphasizes the urgent need for targeted breast cancer awareness campaigns, especially in these age groups, in the region, to promote early detection and improve outcomes by initiating regular screening programs and early approaches to healthcare providers.

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Authors' Contribution

Conceptualization: TMG, NJ
Methodology: TMG, TM, BK, NJ
Formal analysis: TM, SUK, HWA
Writing and Drafting: NJ
Review and Editing: NJ, TM, SUK, HWA

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

The authors declare no conflict of interest.

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