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Original Article

Family History among Breast Cancer Patients Attending the National Cancer Centre in Benghazi - Cross-Sectional Study.

Amina Elsaid [1], Walaa Alfalah[2], Sondos Boker [2], Esraa Alesawi[2]

[1.] Department of Community Medicine, Faculty of Medicine, Libyan International University.
[2.] Faculty of Medicine, Libyan International University.
Corresponding Author, Amina Muftah Elsaid, Email: amina.elsaid@limu.edu.ly

Abstract

Background: Breast cancer (BC) is a type of cancer that develops in the cells of the breast. It is the most common cancer diagnosed in women worldwide, although it can also occur in men. Family history is a major risk factor for breast cancer. Familial breast cancer, defined by the clustering of cases within a pedigree, accounts for roughly 20% to 30% of all diagnoses, while high-penetrance germline mutations in genes such as BRCA1 and BRCA2 contribute to 5% to 10% of the total burden. **Aim:** To determine the percentage of family history of breast cancer among patients attending the National Cancer Centre of Benghazi. **Methodology:** A cross-sectional study was conducted using convenience sampling of all patients with files during 2023. **Results:** A total of 124 female patients, of whom 34% were aged 46 to 55 and 28% aged 36 to 45. The mean age of patients was 51.8 ±11.6, the minimum age was 31, and the maximum age was 81. 55% had a family history of breast cancer. **Conclusion:** This study highlights the significant presence of family history among breast cancer patients attending the National Cancer Centre of Benghazi. More than half of the patients (55%) reported a positive family history of breast cancer, suggesting that hereditary factors may play an important role in the occurrence of the disease among this population. These results emphasise the importance of increasing awareness about family history as a major risk factor for breast cancer and highlight the need for improved screening, early detection programs, and genetic counselling for women with a positive family history to reduce the burden of the disease.

Keywords: Percentage, Breast cancer, Family history, Benghazi

Introduction

Cancer is a major global health problem and one of the leading causes of death worldwide. Breast cancer is currently the most commonly diagnosed cancer in women globally [1]. Research about signs or symptoms of breast cancer has helped to reduce the mortality rate of the disease. Females and males who are susceptible to this disease can self-evaluate before going to the doctor, but doctors have to perform various tests to determine whether the breast cancer is malignant or benign. Common symptoms of breast cancer are a change in the look or feel of the breast and nipple discharge. Examining the breast regularly helps detect these symptoms immediately to prevent growth of disease [2], redness or scariness of the nipple or breast skin, or a discharge are also symptoms, previous surgery affects breast cancer as these women might experience late symptoms and this is caused by surgeries around the chest wall and shoulder, palpable lump, mass, thickening tissue, irregularity that feels distinctly different from surrounding tissue, should be identify as signs and symptoms during lifespan [3].

Early detection remains the primary strategy for reducing breast cancer mortality and enhancing patient prognosis [4]. Standard screening protocols typically involve mammography, clinical breast exams (CBE), and breast self-examination (BSE). While mammography is the gold standard, its implementation is hindered by high costs and the need for specialised infrastructure and professional expertise. Furthermore, randomised trials suggest that mammography offers a

modest 15% relative risk reduction in mortality [5]. In contrast, CBE is a cost-effective alternative, though its specific impact on mortality reduction requires further empirical validation.

It has been argued that the shift in screening strategy should prioritise high-yield, low-cost interventions, a role that CBE is well-positioned to fill [6]. For many developing nations, BSE remains the most

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Feasible approach, serving as a vital tool for both early detection and broader breast health awareness [6].

While environmental, reproductive, and lifestyle factors account for 30% to 50% of cases, genetic predisposition remains a primary determinant of individual risk [7].

The correlation between familial predisposition and disease severity at diagnosis remains under-researched. Clarifying this relationship is essential for refining clinical guidelines regarding screening intervals and therapeutic interventions [3]. Familial breast cancer, defined by the clustering of cases within a pedigree, accounts for roughly 20% to 30% of all diagnoses, while High-penetrance germline mutations in genes such as BRCA1 and BRCA2 contribute to 5% to 10% of the total burden [8]. In clinical practice, family history is categorized by degree: first-degree relatives (parents, siblings, and children) and second-degree relatives (grandparents, aunts/uncles, and half-siblings). Systematic collection of this data during preventive visits is a critical tool for identifying high-risk individuals who require referral for specialized genetic counselling and testing [3].

In Libya, breast cancer is the most common malignancy among women, comprising 35.5% of all female cancer cases at the national level. It shows a rapidly rising incidence rate, currently estimated at 18.8 new cases per 100,000 women. Unlike Western populations, where the disease often peaks after age 60, breast cancer in Libya is characterized by an earlier onset, predominantly affecting premenopausal women with a mean age at diagnosis between 46 and 47 years [9].

Libyan clinical studies have identified family history as a statistically significant predictor of the disease; one case-control study found that 21.6% of breast cancer patients had a positive family history, compared to only 3.9% in the control group [10].

A survey in Derna city has reported a family history prevalence of up to 30% among residents, indicating that a substantial proportion of the population may have genetic susceptibility. Recent genetic analyses have identified 12 distinct variants in the BRCA1 gene among Libyan women with familial clustering, including novel variants not previously reported in North African populations [11].

A significant case-control study conducted in Libyan hospitals, specifically the National Institute for Cancer Therapy in Gharian and Tripoli University Hospital, identified family history as a powerful predictor, finding that 21.6% of breast cancer patients had a positive family history compared to just 3.9% of healthy controls [12].

Researching the association between breast cancer and family history is particularly significant in contexts like Libya, where there is a lack of comprehensive data and limited studies on this topic. Filling these gaps is crucial for understanding the unique genetic and environmental factors influencing breast cancer in Libyan populations. Such research can address disparities in knowledge, improve awareness about hereditary cancer risks, and provide a foundation for

developing targeted screening and prevention programs tailored to the region. This work is vital for advancing cancer care and reducing disease burden in underserved communities. So, this study aims to determine the prevalence of a family history of breast cancer among patients with breast cancer in the National Cancer Centre of Benghazi.

Material Method

Study Design and Setting

A cross-sectional study was conducted at the National Cancer Centre of Benghazi. The study included all patients diagnosed with breast cancer who were aged 18 years or older and attended the centre during the year 2023. A total of 124 patients were included, representing all breast cancer cases recorded in the centre's files during the study period.

Data Collection

Secondary data were collected from the archived medical records at the National Cancer Centre of Benghazi. The variables extracted from the patient files were age, nationality, and the patient's family history of breast cancer.

Limitation

Data acquisition was restricted by the availability and completeness of patient archives at the National Cancer Center in Benghazi. Inconsistencies in record-keeping led to missing data concerning the specific proximity of relatives in family histories. Consequently, the study utilised a smaller sample than initially anticipated for this timeframe.

Data Analysis

The collected data were analysed using IBM SPSS Statistics. Descriptive statistics were applied, and results were presented in terms of frequencies and percentages.

Ethical consideration

This study was approved by the Libyan International Medical University, and all data were anonymised and de-identified to ensure the confidentiality of the collected information.

Result

A total of 124 female patients, of whom 42 (34%) were aged 46 to 55, and 35 (28%) were aged 36 to 45. The mean age of patients was 51.8 ±11.6, the maximum age was 81, and the minimum was 31. Regarding the distribution of

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nationality of patients, the majority of patients (119) (96%) were Libyan. (Table 1)

Table 1: Distribution of patients according to age and nationality**.**

Variable	Frequency (n)	Percentage (%)
Age/years 20-35	7	6.00
36-45	35	28.0
46-55	42	34.0
56-65	20	16.0
> 65	20	16.0
GENDER		
Nationality Libyan	119	96.0
Egyptian	3	2.40
Syrian	1	0.80
Sudanese	1	0.80

Focusing on the family history of patients, more than half of them, 68 (55%), had a positive family history of breast cancer, while 56 (45%) of the patients had a negative family history of the disease. Figure 1

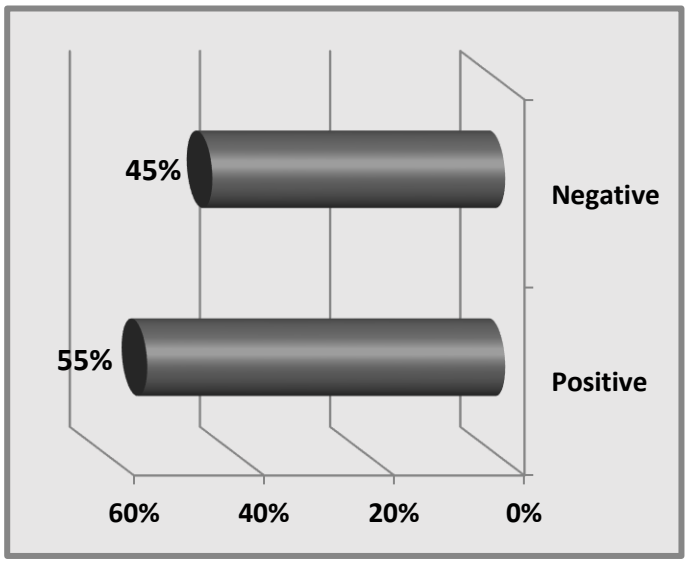

Figure 1: Distribution of patients according to family

Discussion

Breast cancer remains the most common malignancy among women worldwide and is a leading

Cause of cancer-related mortality. Family history is one of the most consistently recognised risk factors for breast cancer, reflecting the contribution of inherited genetic susceptibility, shared environmental exposures, and common lifestyle characteristics within families. The present study examined the prevalence of family history among breast cancer patients attending the National Cancer Centre in Benghazi and described the demographic characteristics of the study population. The findings provide valuable epidemiological information regarding breast cancer patients in eastern Libya and contribute to the limited local evidence concerning familial aggregation of breast cancer.

The current study found that the mean age of breast cancer patients was 51.8 ± 11.6 years, with ages ranging from 31 to 81 years. The largest proportion of patients (34%) belonged to the 46–55-year age group, followed by 36–45-year age group (28%). These findings indicate that breast cancer predominantly affected middle-aged women within the study population. Although breast cancer incidence generally increases with advancing age, women in many Middle Eastern and North African countries, including Libya, tend to present with breast cancer at a younger age than women in Western countries (El Saghir et al., 2007; Elzahaf [13,14,15].

The observed age distribution is consistent with previous Libyan studies reporting that breast cancer frequently affects women during their fourth and fifth decades of life. Earlier investigations conducted in Benghazi and other Libyan cities have demonstrated mean ages at diagnosis ranging between approximately 46 and 52 years, suggesting a relatively younger age at presentation compared with many European and North American populations (Boder et al., 2011; Bodalal et al., 2014) [9, 16]. This pattern has important clinical implications because breast cancer diagnosed in younger women is often associated with more aggressive biological characteristics, delayed diagnosis, higher-grade tumours, and poorer long-term outcomes [17].

The relatively younger age at diagnosis observed in Libya may be explained by several interacting factors. First, Libya has a relatively young population structure compared with many Western countries, naturally increasing the proportion of breast cancer cases occurring before the age of 60 years. Second, inherited genetic susceptibility may contribute to earlier disease onset among women with familial predisposition. Third, differences in reproductive behaviour, obesity, physical inactivity, reproductive hormone exposure, and screening practices may also influence the age at diagnosis (WHO,

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2023; Sung [7, 15]. However, because the present study employed a descriptive cross-sectional design without a comparison group, these factors cannot be evaluated directly and therefore should be interpreted cautiously.

Regarding nationality, almost all patients (96%) were Libyan. This finding primarily reflects the patient population served by the National Cancer Center in Benghazi, which mainly provides oncology services for Libyan citizens residing in eastern Libya. Consequently, the nationality distribution should not be interpreted as indicating nationality-specific susceptibility to breast cancer but rather as representing the catchment population of the healthcare institution. Similar distributions have been reported by hospital-based oncology studies conducted in Libya, where the overwhelming majority of registered patients were Libyan nationals (Boder et al., 2011; Bodalal [9,16].

The most important finding of the present study was that 55% of breast cancer patients reported having a positive family history of breast cancer. This proportion is considerably higher than that reported in many international studies, where the prevalence of positive family history among breast cancer patients generally ranges from approximately 15% to 30%, depending on the definition of family history, degree of relatives included, study design, and population characteristics (Breast Cancer Now, 2023; National Comprehensive Cancer Network [NCCN], 2025) [18]. For instance, the familial frequency reported here far exceeds that found in Sweden by Thalib and Wedren (13%), as well as studies by Melvin et al. (23%), Liaw et al. (14.4%), Tazzite et al. (18.4%), and Habe et al. (11.3%) [3,4,6,19,20]. Such a high concentration of familial cases suggests that in the Libyan context, family history is perhaps the most critical indicator for risk stratification and early detection.

Family history represents one of the strongest non-modifiable risk factors for breast cancer. Women with one first-degree relative diagnosed with breast cancer have approximately twice the lifetime risk of developing the disease compared with women without affected relatives, whereas women with two or more affected first-degree relatives experience an even greater increase in risk (NCCN, 2025; Collaborative Group on Hormonal Factors in Breast Cancer [18,21].

This increased risk reflects the interaction between inherited pathogenic variants, such as mutations in BRCA1, BRCA2, PALB2, CHEK2, and other susceptibility genes, together with shared environmental and behavioural factors among family members (NCCN, 2025; American Cancer Society,[18, 22]. The remarkably high prevalence of positive family history observed in the present study may have several explanations. One possible explanation is the relatively high rate of consanguineous marriages reported in Libya and several neighbouring Arab countries. Consanguinity may increase the clustering of hereditary susceptibility genes within families, thereby increasing the likelihood of familial aggregation of certain hereditary diseases, including some hereditary breast cancers [23].

Although hereditary breast cancers account for only approximately 5–10% of all breast cancer cases worldwide, familial clustering is substantially more common because many affected families share combinations of moderate-risk genetic variants with environmental and lifestyle factors (American Cancer Society, [22].

Another explanation may involve increased awareness of family medical history among patients attending specialized oncology centres. Women diagnosed with breast cancer may be more likely to recall cancers occurring among close relatives after receiving their diagnosis, potentially increasing the reporting of family history. In addition, differences in study methodology should be considered. The present study relied on patient records, which may have documented family history differently from questionnaire-based or population-based investigations. Consequently, direct comparisons with other studies should be interpreted carefully.

The prevalence observed in the current study appears higher than that reported in many regional investigations. Several studies from Middle Eastern countries have documented positive family history among approximately 20–35% of breast cancer patients (El Saghir et al., 2007; Abdel-Razeq [13,24], while studies from Europe and North America often report proportions below 25% (Collaborative Group on Hormonal Factors in Breast Cancer, 2001) [21]. If confirmed by future multicenter studies, the high prevalence observed in Benghazi may indicate a relatively greater contribution of familial factors within the Libyan population.

The finding also has important implications for genetic counselling and hereditary cancer assessment. Current international guidelines recommend that women diagnosed with breast cancer who report a significant family history should undergo formal hereditary cancer risk assessment and, when appropriate, referral for genetic counselling and germline genetic testing [18]. Identification of pathogenic mutations not only benefits the affected patient by guiding treatment decisions, including consideration of PARP inhibitors in BRCA mutation carriers, but also enables cascade testing among relatives who may benefit from enhanced surveillance or preventive interventions[18]. From a public health perspective, the high proportion of patients with a positive family history emphasises the importance of obtaining detailed family histories during

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routine oncology and primary care consultations. Family history remains an inexpensive, non-invasive, and readily available clinical tool that helps identify women at increased risk who may require earlier mammographic screening, breast magnetic resonance imaging (MRI), shorter screening intervals, or preventive strategies according to international recommendations (American Cancer Society, [22].

The findings also highlight the potential need to strengthen hereditary breast cancer services within Libya. Although genetic testing has become increasingly integrated into oncology practice worldwide, access remains limited in many low- and middle-income countries. Establishing specialised hereditary cancer clinics, improving access to molecular genetic testing, and increasing physician awareness regarding hereditary cancer syndromes may improve early detection and individualised management of high-risk families in Libya.

Despite its valuable contribution, the findings should be interpreted with several limitations in mind. First, the study was conducted at a single tertiary referral centre, which may limit the generalizability of the findings to all breast cancer patients in Libya. Referral centres often receive more complex or advanced cases, potentially influencing the observed prevalence of family history. Second, the study used a descriptive cross-sectional design without a comparison group, preventing assessment of the strength of association between family history and breast cancer risk. Third, family history was obtained from existing medical records and may have been affected by incomplete documentation or recall bias. Furthermore, the study did not distinguish between first-degree and second-degree relatives, the number of affected relatives, age at diagnosis among relatives, paternal versus maternal family history, or the specific cancer types reported, all of which influence hereditary cancer risk assessment. Finally, genetic testing was unavailable; therefore, hereditary mutations such as BRCA1 and BRCA2 could not be confirmed.

Nevertheless, the present study provides one of the few available descriptions of family history among breast cancer patients attending the National Cancer Centre in Benghazi. The findings establish important baseline epidemiological data for eastern Libya and underscore the need for future multicenter prospective studies that incorporate standardised family pedigree assessment, molecular genetic testing, and long-term clinical follow-up. Such research would clarify the true contribution of hereditary breast cancer in Libya and help develop evidence-based national screening and prevention strategies.

Overall, the present study demonstrates that more than half of breast cancer patients attending the National Cancer Centre in Benghazi reported a positive family history of breast cancer. This finding underscores the potential importance of familial susceptibility within this population and highlights the need for comprehensive family history assessment, risk stratification, genetic counselling, and targeted screening programs for women with hereditary risk. Strengthening these preventive measures could facilitate earlier diagnosis, improve treatment outcomes, and ultimately reduce breast cancer morbidity and mortality among Libyan women.

Limitations

This study was subject to certain institutional limitations at the National Cancer Center in Benghazi. Retrospective data collection was constrained by a lack of comprehensive electronic medical records, resulting in missing clinical details, specifically regarding the exact degree of kinship in familial cases. Furthermore, the analysis was limited by a relatively small sample size during the study period, which may affect the generalizability of the findings.

Conclusion

- The findings of this study reported that the mean age of diagnosis (51.8 ±11.6 years) is notably lower than Western benchmarks, with a significant majority of patients presenting between ages 36 and 55.
- Most strikingly, the prevalence of a positive family history reached 55%, a figure that vastly exceeds global averages (typically 11%–23%) and serves as a critical indicator of hereditary predisposition within the population. Ultimately, family history in this cohort acts as a primary surrogate marker for risk, identifying a population that deviates significantly from international norms and requires specialised clinical attention.

Recommendation

- National health authorities should consider lowering the baseline age for mammographic screening in Libya to 40 years, or even 35 years for those with a documented first-degree family history.
- There is an urgent need to expand genetic counselling services in Libya. Patients diagnosed under age 50 with a positive family history should be prioritised for BRCA1 and BRCA2 germline mutation testing.
- Public health campaigns should specifically target families with a known history of the disease, emphasising that breast cancer in one member significantly increases the risk for others.
- Future epidemiological causal research

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