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Prevalence of Self-Reported Family History of Colorectal, Breast, and Ovarian Cancers in Derna City, Libya: A Cross-Sectional Survey

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ABSTRACT

Purpose: Family history is an important marker of increased risk for several malignancies, including breast, colorectal, and ovarian cancers. However, community-level data on familial cancer history remain limited in Libya. This study aimed to estimate the prevalence of self-reported family history of these cancers among residents of Derna City, Eastern Libya.

Materials and Methods: A community-based cross-sectional survey was conducted in Derna City between January and June 2026. A total of 300 participants were recruited using a stratified sampling approach across five administrative neighborhoods. Data were collected through face-to-face interviews using a structured questionnaire covering sociodemographic characteristics and family history of breast, colorectal, and ovarian cancers among first- and second-degree relatives. Prevalence estimates were calculated with 95% Wilson score confidence intervals.

Results: The mean age of participants was 24.65 ± 4.70 years, and 80.7% were female. Self-reported family history was most common for breast cancer, reported by 30.0% of participants (95% CI: 25.1–35.4), followed by colorectal cancer in 23.3% (95% CI: 18.9–28.4) and ovarian cancer in 13.3% (95% CI: 9.9–17.6). The findings indicate a substantial reported burden of cancer occurrence among close and extended family members in the surveyed population.

Conclusion: Self-reported family history of breast, colorectal, and ovarian cancers was common among participants in Derna, particularly for breast and colorectal cancers. Systematic family-history assessment may support local cancer-risk evaluation and clinical decision-making. Interpretation should remain cautious because family histories were self-reported and the sample was predominantly young, female, and university educated. (*Open J Biomed Res 2026;5:123-130*)

Keywords: Family history, breast cancer, colorectal cancer, ovarian cancer, Derna, cross-sectional study.

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INTRODUCTION

Cancer is a major and growing public health challenge worldwide. Among the major cancer types, breast cancer is the most commonly diagnosed malignancy in women, while colorectal cancer is the third most frequently diagnosed cancer overall. Ovarian cancer is less common but remains an important cause of cancer-related mortality among women, in part because a large

proportion of cases are diagnosed at an advanced stage.[1]

The development of colorectal, breast, and ovarian cancers is multifactorial, involving interactions among age, environmental and lifestyle exposures, reproductive factors, and inherited genetic susceptibility. Family history is an important and readily identifiable marker of cancer risk. Individuals with affected first-degree relatives may have an increased risk of developing the same or related cancers, although the magnitude of this risk varies according to the cancer type, number and degree of affected relatives, and age at diagnosis of affected family members.[2-4] Familial clustering may reflect shared genetic susceptibility, shared environmental or lifestyle exposures, or a combination of these factors.

A proportion of familial breast and ovarian cancers is attributable to pathogenic variants in cancer-predisposition genes, particularly *BRCA1* and *BRCA2*, while hereditary colorectal cancer syndromes include Lynch syndrome, which is associated with pathogenic variants affecting DNA mismatch-repair genes[3,5] Nevertheless, the presence of a family history does not necessarily indicate a hereditary cancer syndrome, because most individuals reporting an affected relative will not have an identifiable high-penetrance pathogenic variant.

Identification of a relevant family history has important clinical implications because it can facilitate cancer-risk assessment and help identify individuals who may benefit from genetic counseling, genetic testing where appropriate, or risk-adapted screening and preventive strategies. Family-history information should, however, be interpreted cautiously in questionnaire-based studies because self-reported histories may be incomplete or inaccurate.[6]

Cancer epidemiology in Libya has been described through studies from Eastern and Western Libya. Data from the Benghazi Cancer Registry have demonstrated that breast and colorectal cancers are among the leading malignancies in Eastern Libya,[7,8] while studies from Benghazi Medical Center and Tripoli have provided additional information on cancer patterns in the country.[9-11] However, these studies have focused predominantly on cancer incidence and patterns among diagnosed cases rather than on the prevalence of cancer family history in the general population. Evidence on self-reported family histories of colorectal, breast, and ovarian cancers in individual Libyan communities, including Derna, therefore remains limited.

Population-based assessment of family history may provide useful baseline information for estimating the proportion of individuals who could warrant further cancer-risk assessment and may also support the planning of locally appropriate prevention and awareness strategies. Similar questionnaire-based approaches have been used to estimate the prevalence of family histories of colorectal, breast, and ovarian cancers in other populations.[12]

Therefore, the present cross-sectional survey aimed to estimate the prevalence of self-reported family history of colorectal, breast, and ovarian cancers among residents of Derna City, Eastern Libya. The findings are intended to provide baseline epidemiological data on familial cancer history in this population and to inform future research, cancer-risk assessment, and locally appropriate screening and prevention initiatives.

MATERIALS AND METHODS

Study Design and Participants

A community-based cross-sectional study was conducted in Derna City, Eastern Libya, between January and June 2026. Derna is an urban administrative and commercial center in northeastern Libya. The target population consisted of residents of Derna City aged 18 years or older. Individuals were eligible to participate if they were residing in Derna during the study period, were able to provide information regarding their family medical

history, and provided written informed consent.

The minimum required sample size was estimated using Cochran's formula for a single population proportion. Assuming an expected prevalence of 20%, a 5% margin of error, and a 95% confidence level, the minimum sample size was calculated to be approximately 246 participants. To account for potential non-response and incomplete questionnaires, the target sample size was increased to 300 participants. A stratified random sampling approach was used across five administrative neighborhoods in Derna City to improve geographic representation, resulting in a final sample of 300 participants.

Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Medical Technology, Derna, Libya. All participants were informed about the purpose and procedures of the study and provided written informed consent before participation. Participation was voluntary, and confidentiality and anonymity were maintained throughout the study. No personally identifying information was included in the analytical dataset.

Data Collection and Study Variables

Data were collected through face-to-face interviews conducted by trained clinical researchers using a structured questionnaire. The questionnaire collected sociodemographic information, including age, sex, and educational level, as well as information regarding family history of colorectal, breast, and ovarian cancers.

Family history was assessed among first-degree relatives, defined as parents, siblings, and children, and second-degree relatives, including grandparents, aunts, and uncles. Participants were asked whether any of these relatives had previously been diagnosed with colorectal, breast, or ovarian cancer.

For the purposes of this study, a positive family history was defined as self-report of at least one first- or second-degree relative diagnosed with the cancer under consideration. Reported diagnoses were based on participant recall and were not independently verified through medical records or cancer-registry data. The primary outcome measures were the prevalence of self-reported family history of colorectal, breast, and ovarian cancers. Sociodemographic characteristics and the degree of relationship to affected relatives were also recorded.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics, version 26.0. Continuous variables were summarized using means and standard deviations (SD), whereas categorical variables were presented as frequencies and percentages. The prevalence of self-reported family history of each cancer type was calculated as the proportion of participants reporting at least one affected first- or second-degree relative. Corresponding 95% confidence intervals (CIs) were estimated using the Wilson score method.

Associations between categorical sociodemographic characteristics and the presence of a positive family history were assessed using Pearson's chi-square test. Fisher's exact test was used when expected cell frequencies were too small to satisfy the assumptions of the chi-square test. All statistical tests were two-sided, and a p-value <0.05 was considered statistically significant.

RESULTS

Participant Characteristics

A total of 300 participants completed the survey. The mean age was 24.65 ± 4.70 years. Women constituted the majority of the study population (80.7%). Among participants with available age and educational data (n = 278), 67.3% were younger than 25 years and 93.5% had university-level education. The sociodemographic characteristics of the participants are summarized in Table 1.

Table 1: Sociodemographic characteristics of the study participants.

Characteristic	Category	n	%
Sex (n = 300)	Female	242	80.7
	Male	58	19.3
Age group (n = 278)	<25 years	187	67.3
	25–35 years	83	29.9
	>35 years	8	2.9
Education level (n = 278)	Secondary	13	4.7
	University	260	93.5
	Postgraduate	5	1.8

Percentages were calculated using the number of participants with available data for each variable. Age and educational-level data were available for 278 participants.

Prevalence of Self-Reported Family History of Cancer

As The prevalence of self-reported family history differed across the three cancer types examined (Table 2). Breast cancer had the highest reported prevalence of family history, followed by colorectal cancer, whereas ovarian cancer had the lowest prevalence.

Table 2: Prevalence of self-reported family history of breast, colorectal, and ovarian cancers (N = 300).

Cancer type	Positive family history, n (%)	No family history, n (%)	Prevalence, % (95% CI)
Breast cancer	90 (30.0)	210 (70.0)	30.0 (25.1–35.4)
Colorectal cancer	70 (23.3)	230 (76.7)	23.3 (18.9–28.4)
Ovarian cancer	40 (13.3)	260 (86.7)	13.3 (9.9–17.6)

Confidence intervals were calculated using the Wilson score method. Cancer-specific family-history categories were not necessarily mutually exclusive because an individual participant could report a family history of more than one cancer type.

DISCUSSION

This community-based cross-sectional survey provides preliminary data on the prevalence of self-reported family history of breast, colorectal, and ovarian cancers among residents of Derna City, Eastern Libya. The main finding was that breast cancer was the most frequently reported familial malignancy, with 30.0% of participants reporting at least one affected first- or second-degree relative, followed by colorectal cancer at 23.3% and ovarian cancer at 13.3%. These findings suggest that a substantial proportion of the surveyed population reported cancer among close or extended family members and highlight the potential value of systematically recording family history as part of clinical risk assessment.

The reported prevalence of family history of breast cancer in the present study was comparatively high. However, direct comparison with previous population studies requires caution because studies differ substantially in the age and sex distribution of participants, the degree of relatives included, and the method used to ascertain family history. For example,

Wallace et al. reported that 17% of respondents aged 30–65 years in a Scottish general-practice population had a family history of at least one of colorectal, breast, or ovarian cancer.[12] Earlier community-based studies have reported lower frequencies when more restrictive definitions of family history were applied. In a British population, approximately 6.8% of women younger than 50 years and 9.7% of those aged 50–65 years were estimated to have at least one first-degree relative with breast cancer.[13] A population-based study from Tehran reported breast cancer family history in 1.8% of first-degree relatives and 2.5% of second-degree relatives.[14] The higher proportion observed in Derna may therefore reflect, at least in part, differences in study definitions, participant characteristics, family size, awareness of relatives' diagnoses, or reporting practices rather than a true difference in inherited cancer susceptibility.

Family history is nevertheless an established marker of breast cancer risk. A large collaborative analysis found that breast cancer risk increased progressively with the number of affected first-degree relatives, and a previous meta-analysis similarly demonstrated an approximately twofold increase in risk associated with an affected first-degree relative.[2] Importantly, family history should not be considered synonymous with the presence of a pathogenic germline variant. Although BRCA1 and BRCA2 pathogenic variants account for an important proportion of hereditary breast and ovarian cancer syndromes, most individuals reporting an affected relative will not necessarily carry such variants.[5,15] Therefore, the present findings should primarily be interpreted as evidence of reported familial clustering rather than as an estimate of hereditary breast cancer prevalence.

The prevalence of self-reported family history of colorectal cancer was also notable, at 23.3%. Family history is a well-established determinant of colorectal cancer risk. Meta-analyses indicate that individuals with one affected first-degree relative have an approximately 1.5- to 2.3-fold higher risk of colorectal cancer than individuals without such a history, with greater risk among those with multiple affected relatives or relatives diagnosed at younger ages.[16-18] This distinction is clinically important because screening recommendations depend not merely on the presence of any affected relative, but also on the degree of relationship and age at diagnosis. Current guidance recommends earlier screening for individuals with an affected first-degree relative; for example, recent expert guidance recommends initiating screening at age 40 years or 10 years before the age at diagnosis of the youngest affected first-degree relative, whichever occurs earlier, for individuals at increased familial risk.[19,20] These recommendations cannot be applied directly to all participants in the present study because first- and second-degree family histories were combined in the principal prevalence estimate and the age at cancer diagnosis of affected relatives was not incorporated into the current analysis.

Self-reported family history of ovarian cancer was identified in 13.3% of participants. Family history is particularly relevant in ovarian cancer because routine population screening of asymptomatic women at average risk has not been shown to reduce ovarian cancer mortality and is not recommended by the U.S. Preventive Services Task Force.[21] In contrast, women whose personal or family history suggests an increased probability of BRCA1/2-associated cancer may benefit from structured familial risk assessment, followed where appropriate by genetic counseling and genetic testing.[15] For individuals with confirmed pathogenic variants associated with substantial ovarian cancer risk, preventive strategies may include risk-reducing salpingo-oophorectomy according to gene-specific recommendations and individual clinical circumstances.[22] Thus, the relevance of the present findings lies not in recommending ovarian cancer screening for all participants with an affected relative, but in identifying individuals whose family-history pattern may justify more detailed hereditary-cancer risk assessment.

The demographic characteristics of the study population should also be considered when interpreting the findings. The sample was predominantly female and relatively young,

with a mean age of 24.65 years, and most participants with available educational data had university-level education. These characteristics differ from those of many population-based family-history studies, which often include broader age distributions. Younger and more highly educated participants may differ in their awareness, recall, or willingness to report family diagnoses, while the predominance of women may also influence awareness of breast and ovarian cancers within families. Consequently, the observed prevalence estimates should not automatically be generalized to the entire population of Derna without confirmation in a more demographically representative sample.

The study has several limitations. First, cancer family history was self-reported and was not verified through medical records, pathology reports, or cancer-registry data. Misclassification is therefore possible through inaccurate recall, uncertainty regarding the primary cancer site, or incomplete knowledge of relatives' diagnoses. Previous work has shown that the accuracy of reported family history may vary by cancer type and degree of relationship.[6] Second, the inclusion of both first- and second-degree relatives in the primary definition increases sensitivity for detecting familial cancer occurrence but limits direct comparison with studies and clinical guidelines based only on first-degree relatives. Third, the predominance of young, female, and university-educated participants limits the external validity of the estimates. Fourth, genetic testing was not performed; therefore, no inference can be made regarding the prevalence of BRCA1/2, mismatch-repair, or other cancer-predisposition variants. Finally, information on the age at cancer diagnosis among affected relatives, number of affected relatives, maternal or paternal lineage, and verification of reported diagnoses would be valuable for more precise familial-risk classification.

Despite these limitations, the study provides baseline information on self-reported family history of three clinically important cancers in Derna City, an area for which such community-level data are limited. The findings support the inclusion of structured family-history assessment in future epidemiological studies and clinical encounters. Further research using larger and more representative samples, standardized pedigree-based questionnaires, age at diagnosis of affected relatives, and, where feasible, confirmation through cancer registries or genetic counseling services would help determine the proportion of individuals whose family-history patterns meet established criteria for enhanced screening or hereditary-cancer evaluation.

CONCLUSION

This cross-sectional survey provides baseline data on self-reported family history of breast, colorectal, and ovarian cancers among residents of Derna City, Eastern Libya. Breast cancer was the most frequently reported familial malignancy, followed by colorectal and ovarian cancers. The findings highlight the potential value of systematic family-history assessment in clinical practice and local cancer-risk evaluation, while interpretation should remain cautious given the self-reported nature of the data and the predominantly young, female, and university-educated study population.

AUTHOR CONTRIBUTIONS

Mohammed A. Al-Ghazali: Writing-original draft, literature review, investigation, data curation, and manuscript preparation. **Bashir M. Lakhal:** Conceptualization, methodology, validation, critical review, writing-eview & editing, and final approval of the manuscript. **Sideena A. Ehmeedah:** Conceptualization, methodology, validation, critical review, writing-review & editing, and final approval of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflicts of interest concerning the research, authorship, and publication of this article.

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