

Original article

Prevalence of Cancer in the Middle Region of Libya According to the National Cancer Institute of Misurata In 2022

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Abstract

This study was conducted on data registered at the National Cancer Institute of Misurata in the year 2022. This study aimed to determine the most registered tumors and the most registered age groups, as well as the cities from which the cases were received. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) program, version 22. A total of 786 confirmed cases during the year 2022 were included in the analysis. The results of the statistical analysis revealed that the 51–60 age group exhibited the highest cancer frequency, accounting for 22.9%, whereas the 11–20 age group registered the lowest proportion, at just 1.9%. In terms of cities, the highest proportion of cases was in the city of Misurata, at a rate of 40.7%, where the number of cases reached 320, and the lowest proportion of cases was in the city of Misallata, where the number of cases reached 42. In terms of type, the highest frequency was observed for breast cancer, representing 23.3% (183), while the lowest frequency was noted for esophageal cancer, comprising merely 0.3%, reaching two. In terms of gender, the highest prevalence rate was for females, at a rate of 54.3%, where the number of cases reached 427 cases, and the lowest prevalence rate was for males, at a rate of 45.7%, where the number of cases reached 359 cases. According to the results obtained, it is recommended to hold a scientific seminar for community education about the symptoms of cancer and the importance of early diagnosis through the implementation of screening programs for cancer.

Keywords. Cancer, Epidemiology, Prevalence, Registry.

Introduction

Cancer is a growing international public health challenge, marked by rising rates of occurrence and associated mortality rates, posing significant challenges to healthcare systems, especially in low- and middle-income countries. Libya, akin to other nations within North Africa, has witnessed a notable escalation in the prevalence of cases during the preceding decade. This phenomenon has been particularly evident in the middle region of Libya, akin to other nations within North Africa, which have witnessed a notable escalation in the prevalence of cases during the preceding decade. This phenomenon has been particularly evident in the middle region of Libya, where factors such as industrial advancement, environmental degradation, alteration in lifestyle, and restricted access to early diagnostic services have intensified the cancer burden [1-3].

Although there has been a consistent reduction in overall mortality rates attributable to early detection and enhanced treatment modalities, the incidence rates of several significant malignancies, including breast, pancreatic, uterine, and prostate cancers, persist in their upward trajectory [4, 5]. Within the context of the Middle East and North Africa (MENA) region, which encompasses Libya, cancer is emerging as a growing burden linked to changes in lifestyle, rising obesity rates, and physical inactivity, as well as smoking and exposure to environmental and occupational carcinogens [2,4,6-8]. Unhealthy diets are major contributing factors to many types of cancer, most notably lung, bladder, colorectal, and breast cancers [2,4,7].

Breast cancer stands as the most frequently diagnosed cancer among women in this region, representing about a quarter of all cancers of the female reproductive system and about the fifth most common of cancer-related death, characterized by considerable differences in incidence and mortality rates among cities [9]. GLOBOCAN 2022 estimates indicate that MENA countries have higher breast cancer mortality rates than most other regions, despite relatively low incidence rates. This reflects challenges in early diagnosis, delayed diagnosis, and weak oncology infrastructure ([9, 10]. On the other hand, analyses of the international burden of certain cancers in the North Africa and Middle East region, such as nasopharyngeal and gastrointestinal cancers, show that some countries in the region, including Libya, have relatively high incidence or prevalence rates in certain age groups [11, 7].

Areas with low and middle socioeconomic indicators experience worse health outcomes, including lower survival rates, reflecting limited access to specialized oncology diagnosis and treatment [12,13]. Treatment costs and regional disparities in service availability are also contributing factors. The geographic/spatial dimension of cancer epidemiology is another important theoretical dimension [7,12-14]. The unequal provision of oncology services, such as chemotherapy treatment and radiotherapy facilities or advanced diagnostic laboratories, is affecting the early diagnosis chances, cancer stages at diagnosis time, mortality rates, and survival rates [9,15]. This regional situation makes studying cancer

prevalence in sub-regions within Libya, such as the middle region, important for knowing the spatial distribution of the cancer burden and determining health intervention policy. The importance of cancer is a pivotal epidemiological metric in the evaluation of the health burden, as it amalgamates the occurrence of new cases (incidence rate) with the duration of survival, thereby reflecting a summation of pathobiological determinants that influences the efficacy of early diagnosis protocols, availability of therapeutic interventions, and prospects for survival [1,4]. This conceptual indicator renders the investigation of cancer prevalence in Libya, as informed by specialized registries such as the National Cancer Institute – Misurata, an instrumental approach for comprehending the interplay of various factors: patient diagnosis, delays in referral, and accessibility to treatment [11.13].

Objectives of the study

1. To evaluate the prevalence of cancer within the middle region of Libya, utilizing data obtained from the national cancer institute in Misurata.
2. To determine the predominant kind of cancer affecting males and females.
3. To determine the age and gender demographics of groups.

Methods

Study Design

Descriptive retrospective study evaluating the prevalence of cancer cases in the middle region of Libya, with determination of epidemiological trends according to demographic and geographic variables.

Study Population and Sample

The study population comprised all patients diagnosed with cancer and registered at the National Cancer Institute in Misurata during the year 2022. A total of 786 confirmed cases were included in the study. The inclusion criteria comprised patients of both genders, including all age groups, with a histopathologically verified diagnosis of cancer, who resided in the middle region of Libya. Cases with incomplete records or unverified diagnoses were excluded to ensure data reliability and validity.

Study Area

The study was performed in the middle region of Libya, encompassing the cities (Sert, Misurata, Zliten, Al-Khums, Ben Walid, Misallata and Tarhona), and this area is served by the National Cancer Institute–Misurata, which is the main tertiary healthcare center for oncology within the region.

Data Collection

The data were collected retrospectively from the National Cancer Institute's official registry and patient medical records. The dataset included epidemiological and clinical variables.

Data Analysis

Data entry and analysis were performed using SPSS version 22. Descriptive statistics, including frequencies and percentages, were applied to summarize the data.

Ethical Clearance

Ethical approval for this study was obtained from the National Cancer Institute – Misurata. Patient confidentiality and data protection were strictly maintained; personal identifiers were removed from all datasets prior to analysis.

Results

The study conducted on the distribution of cancer in cities of the middle region of Libya, obtained from the National Cancer Institute Misurata, found 786 patients. The middle region samples were analyzed to determine the distribution of Cancer in the cities of the region, as well as the age groups with the highest incidence. Furthermore, the analysis aimed to determine the number of males and females affected in the middle region. Additionally, these results were analyzed to identify the most prevalent types of cancer and their respective highest number of cases.

The data analysis for the samples from the middle region is as follows:

Sex Category

The greatest percentage rate for the number of cases in a sample is for the Female gender with a 54.3% percentage for (427 patients). The lowest percentage rate was for the male gender with 45.7% for (359) patients, as we can see from (Table 1).

Table 1. Frequencies Table for Sex Category

Sex Category	Frequency	Percent
Female	427	54.3%
Male	359	45.7%

Age Category

The data obtained from 786 cases depends on age, obtained from the National Cancer Institute Misurata in the middle region of Libya. The greatest percentage rate for the number of cases in a sample is the range (51–60) with 22.9%. The lowest percentage rate was in the range (11-20) with 1.9%, as we can see from (Table 2).

Table 2. Frequencies Table for Age Category

Age Range	Frequency	Percent
0-10	0	0
11-20	15	1.9%
21-30	18	2.3%
31-40	64	8.1%
41-50	162	20.6%
51-60	180	22.9%
61-70	154	19.6%
71-80	132	16.8%
81-Above	61	7.8%

Address Category

The data obtained from 786 cases from the National Cancer Institute Misurata in the middle region of Libya. The greatest percentage rate for the number of cases in a sample is for the city of Misurata, with a 40.7% rate. The lowest percentage rate was for Misallata city with 5.3% percentage that we can see from (Table 3).

Table 3. Frequencies Table for Address Category

Address	Frequency	Percent
Misurata	320	40.7%
Al-Khums	136	17.3%
Zliten	134	17.0%
Tarhona	53	6.7%
Sert	53	6.7%
Ben Walid	48	6.1%
Misallata	42	5.3%

Diagnosis Category

The data obtained from 786 cases diagnosed at the National Cancer Institute Misurata in the middle region of Libya. The greatest percentage rate for the number of cases in a sample is for breast cancer with a 23.3% percentage for (183 patients). The lowest percentage rate was for esophageal cancer with 0.3% (2 patients), that we can see from (Table 4).

Table 4. Frequencies Table for Diagnosis Category

Diagnosis	Frequency	Percent
Breast cancer	183	23.3%
Colorectal cancer	147	18.7%
Prostate cancer	70	8.9%
Lung cancer	70	8.9%
Lymphoma cancer	45	5.7%
Ovary cancer	35	4.5%
Endometrial cancer	24	3.1%
Head and Neck cancer	23	2.9%
Brain and Nervous system cancer	19	2.4%
Bladder cancer	17	2.2%
Stomach cancer	17	2.2%
Leukemia	17	2.2%
Thyroid cancer	16	2.0%
Pancreas cancer	16	2.0%
Multiple Myeloma	15	1.9%
Liver cancer	13	1.7%
Kidney cancer	13	1.7%
Biliary system cancer	10	1.3%
Skin cancer	5	0.6%
Esophageal cancer	2	0.3%
Other types	29	3.7%

Discussion

This epidemiological study of cancer indicates that there were 786 cases of cancer in the middle region of Libya, which were registered at the National Cancer Institute in Misurata, Libya, during 2022. This was achieved by analyzing the distribution of cases according to gender, age, type of cancer, and geographic region. The results indicate that females were more affected, with 427 cases (54.3%) compared to 359 cases (45.7%) for males. This result is consistent with a study performed in Misurata in 2021 (July 2019 - June 2020), which showed 238 cases for females (55.3%) and 192 cases for males (44.7%) [16].

The finding also indicated that the age group most susceptible to cancer was 51-60 years, at 22.9%, with 180 cases, followed by the 41-50 age group at 20.6%, with 162 cases. This finding aligns with a previous study conducted in Misurata in 2021 (July 2019 - June 2020) [16]. This also revealed that the 51-60 age group was the most susceptible to cancer.

Regarding the diagnostic categories, statistical analysis of the data revealed that breast cancer was the most prevalent among patients registered at the National Cancer Institute in Misurata, at 23.3%, with 183 cases. Colon cancer came in second at 18.7%, with 147 cases. This finding is consistent with a study performed in Misurata in 2021 (July 2019 - June 2020) [16]. This showed that the highest incidence was breast cancer at 19.5%. It is also consistent with a previous study conducted in Tobruk (2021) [17]. This showed that the highest incidence was breast cancer at 18.4%.

Regarding the geographic distribution, the findings indicate that among 786 cases at the National Cancer Institute in Misurata, in the middle region of Libya, the highest incidence was in Misurata city itself at 40.7% (320 cases). Al-Khums city came in second at 17.3% (136 cases), followed by Zliten city at 17.0% (134 cases). This result is consistent with a previous study conducted in Misurata (2013-2019) [18]. This showed that the highest prevalence of cases was in the city of Misurata at 43%, amounting to 1801 cases.

Limitations of the study

Although this study provides valuable baseline data, its findings should be interpreted considering certain limitations. First, as a hospital-based registry study, it includes only cases that were seen and registered at the National Cancer Center in Misurata. It may not include all cancer cases in the region, particularly those diagnosed and treated at other facilities, those who sought treatment abroad, or those who were never diagnosed. It is therefore probable that the reported figures underestimate the actual occurrence of cancer in the region. Moreover, the dataset is cross-sectional and limited to a single year (2022), which restricts the ability to evaluate long-term trends in cancer occurrence. In addition, the analysis was confined to basic demographic characteristics; essential information on potential risk factors like family history, diet, obesity, smoking, or occupational exposures was not available, thereby limiting causal interpretation.

Future research should be directed to the establishment of a comprehensive population-based cancer registry across the middle region to generate more accurate prevalence data. Longitudinal studies are required to monitor trends and assess the effectiveness of any future interventions. Furthermore, analytical studies such as case-control or cohort studies are necessary to identify and validate specific risk factors contributing to the elevated occurrence rates of breast cancer and colorectal cancer in Libya.

Conclusion

This study demonstrates that cancer patients recorded at the National Cancer Center - Misurata in 2022 were characterized by a mild elevation in the prevalence rate among females, a peak occurrence within the 51-60 age group, and a pronounced predominance of breast and colorectal cancers. These findings underscore the urgent need for targeted cancer control strategies and structured screening protocols. The National Cancer Institute - Misurata serves as a pivotal regional referral center with a patient population extending beyond the city itself, accordingly addressing the burden of these prevalent cancers through prevention programs, health education, early diagnosis and screening programs, and improved treatment capacity, which should be a top priority for public health authorities in Libya.

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Conflicts of Interest

All authors declare that there are no conflicts of interest.

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