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Understanding the Incidence, Screening, and Burden of Cancer in Somalia: A Literature Review

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Abstract

Objectives: To determine the incidence, frequency, and distribution of all cancers in Somalia from 2015 to 2023.Methods: Data were collected using the following databases: EMBASE, Springer, Google Scholar, and Pubmed. This review follows PRISMA guidelines and Prisma guidelines were used in this study. Published articles from 2015 to 2023 on the topic of cancer in Somalia were searched in relevant and accessible databases using the following keywords: "cancer or cancer distribution or Somalia," "cancer registration systems or prevention." Results: After reviewing all the latest literature, the results show contrasting rates of incidence, frequency, and distribution of all cancers in Somalia. The very high rates observed in Somalia strongly suggest that strong environmental risk factors have an impact on the Somali population. Conclusion: Serious and extensive research on the etiology is required. Screening methods may cause the spread of priorities. As a result, the determination of local cancer risk factors in the development of early diagnostic methods and the creation of the cancer registration system will form the basis for the project to be developed for the prevention of cancer.

Keywords: Cancer Distribution, Somalia, Cancer Registration System, Cancer Prevention.

Highlights

- Promoting public awareness and prevention by controlling and reducing the incidence and effect of cancer-related diseases.
- Focusing on community members through advocacy and awareness raising, treatment Prevention, and palliative care to minimize and prevent the negative impact of the disease through community mobilization.
- There are limited studies that have focused on evaluating Somalian Current Cancer Levels.

Tilmaamaha (Somali Translation)

- Kor u qaadista wacyiga dadweynaha iyo ka hortaga Kansarka iyadoo la xakameynayo lana yareynayo dhacdooyinka iyo saameynta cudurrada la xiriira kansarka
- Diirada saarista xubnaha blushada iyada oo loo marayo u doodista iyo wacyigelinta, daawaynta ka hortagga, iyo daryeelka palliative si loo yareeyo loogana hortago saameynta xun ee cudurka iyada oo loo marayo abaabulka bulshada.
- Waxaa jira daraasado kooban oo diiradda saaray qiimeynta Heerarka Kansarka ee Soomaaliya.

1. Introduction

Cancer is an important cause of mortality in both economically underdeveloped and highly developed countries. Due to the increase in population and aging, cancer is expected to increase throughout the world, but especially in underdeveloped countries in which 82% of the global population lives[1]. According to the 2015 estimates of the World Health Organization (WHO), cancer is the first or second cause of mortality in 91 of 172 countries before the age of 70 years, and the third or fourth cause of mortality in 22 [2]. The ongoing global demographic and epidemiologic transitions mean an increasing cancer burden, especially in low and middle-income countries for the following decades. It is estimated that the global cancer burden caused 14.1 million new cases and 8.2 million deaths in 2012, which increased to 18.1 million new cases and 9.6 million deaths in 2018. Globally, one in five men and one in six women develop cancer in their lifetime, while one in eight men and one in 11 women die of this disease[3].In Africa, it is estimated that there were 1,055,172 new cancer cases (5.8% of the global total) and 693,487 cancer deaths (7.3% of the global total) in 2018. The world has been divided into 20 regions to estimate cancer incidence and mortality rates. Somalia is included in the East African region. It is estimated that approximately one-third of cancer cases in Africa occur in the East Africa region[4]. Since there is no national cancer registry system in Somalia, the population-based cancer incidence is unknown. Although Baş et al. The etiology behind the rising cancer burden in low- and middle-income countries (LMICs) is likely to be multifactorial and include changes in demographics and lifestyle. The higher proportion of patients with cancer in LMICs who have advanced-stage disease at the time of diagnosis has led to a greater case fatality rate in LMICs compared with high-income countries[5] We evaluated the published literature from 2015 to 2023, due to a limited number of research papers in Somalia, the result of this review is not sufficient to reflect the real situation for the Whole Population in Somalia, Therefore, the current review can be considered a comprehensive study on the incidence and distribution of all cancers in Somalia. The current study aimed to determine the cancer incidence and distribution of cancer patients diagnosed in Somalia

1.1 Somalia Demographics

Somalia, the easternmost nation in Africa, is slightly smaller than the state of Texas in terms of land size (637,540 km2). Due to its geographic similarity to the horn of a rhinoceros, Somalia is at the tip of a region that is often known as the Horn of Africa, which also includes Ethiopia and Djibouti [6]. Somalia has an estimated population of around 15 million and has been described as Africa's most culturally homogeneous country[7]. Around 85% of its residents are ethnic Somalis who have historically inhabited the country's north. Ethnic minorities are largely concentrated in

the south. The official languages of Somalia are Somali and Arabic[8]. Most people in the country are Muslims. Many of them are Sunn[9]. The current population of Somalia is 18,430,758 as of Friday, January 5, 2024, based on Worldometer elaboration of the latest United Nations data, Somalia ranks 69th in the list of countries (and dependencies) by population[10].

2. Types of Cancers

2.1 Esophageal Cancer (EC)

According to the 2018 data of global cancer statistics, lung cancer (11.6%; n = 2,093,876) is the most common type of cancer, followed by breast (11.6%; n = 2,088,849), colorectal (10.2%) and prostate (7.1%) cancers. According to the gender analysis, the order of cancers by incidence is lung (14.5%), prostate (13.5%) and colorectal (10.9%) for men, and breast (24.2%), colorectal (9.2%) and lung (8.4%) for women[11]. it is stated that EC is two to three times more common in men worldwide. EC is 2 to 8 times more common in men than in women in most areas of the world. However, the EC incidence was detected equally in both genders (male/female ratio: 1) in this study, which is an important finding. In a recent epidemiological study, Pan et al[11] found that EC is only up to about 1.5-fold more common in men than in women in a rural area, and alcohol/tobacco use plays only a minor role, whereas some other factors that influence both sexes equally may take the main responsibility, such as environmental and dietary factors. Therefore, the areas that have high EC incidence may have something in common. While EC is the leading cause of cancer mortality in men in Kenya, it has been shown to have the highest global incidence in both men and women in Malawi[12]. These patients may remain clinically asymptomatic for a long time. If the disease progresses, it can lead to complaints, such as weight loss and dysphagia. All the patients in the current study presented with progressive dysphagia or weight loss in the advanced stage of the disease. Unfortunately, due to the lack of endoscopic US (EUS) and positron emission tomography (PET) in Somalia, CT was used for staging. Although at the time of presentation, almost all patients were at an advanced stage; ie, T3 (invasion of adventitia) or T4 (invasion of adjacent structures), chemoradiation treatment could not be applied to these patients due to the absence of an oncology clinic. Furthermore, since oncological treatment costs are very high, only a small proportion of patients were able to travel to Turkey for this treatment. All these factors negatively affected the reliability of our data concerning the mortality rates.

2.1 Liver Cancer

Liver cancer is estimated to be the sixth most frequently diagnosed cancer and the fourth leading cause of cancer deaths worldwide, with approximately 841,000 new cases and 782,000 deaths per year. In most regions, both incidence and mortality associated with liver cancer are two to three times higher among men. It is the most common cancer in 13 geographical countries, especially in North and West Africa [13].In the current study, liver cancer was determined as the sixth most common cancer in Somalia according to the overall ranking while it was the second most common cancer in men. The incidence of liver cancer was twice as high in men as in women. Primary liver cancer includes hepatocellular carcinoma (HCC) (75–85% of cases) intrahepatic cholangiocarcinoma (10–15% of cases), and other rare types. Major risk factors for HCC are HBV or HCV, aflatoxin-contaminated foodstuffs, heavy alcohol intake, obesity, smoking, and type 2 diabetes[14].In Somalia, tobacco use is very low and alcohol consumption is prohibited. In our study, only 19.2% (n = 19) of the cases had HBV (n = 17) or HCV (n = 2) infection. Only two of

the patients had a history of type 2 diabetes. However, although the etiology of other cases is not precisely known, in recent years, it has been reported that foods contaminated with aflatoxin have increased the incidence of liver cancer, especially in East Africa[15]. Therefore, further research (case-control studies, cohort studies, etc.) should be conducted to reveal the relationship between aflatoxin and liver cancer in the region.

2.3 Cervix Uteri Cancer

Cervical cancer is the fourth most frequently diagnosed cancer (ASR of 13.1/100,000) and the fourth leading cause of cancer-related deaths in women, with 570,000 new cases (6.6% of the global total) and 311,000 deaths (7.5% of the global total) [16].[Table 1] The 2018 data show that cervical cancer ranks second in incidence and mortality in low-income countries (LICs) after breast cancer; however, it is the most frequently diagnosed cancer in 28 countries and the leading cause of cancer deaths in 42 countries, with the vast majority of cases being reported in SSA and Southeast Asia[17]. According to WHO,[Table2] the incidence of cervical cancer, which ranked second in Somalia after breast cancer in 2018 is reported to have an incidence of 24/100,000 and a mortality of 21.6/100,000 [18]. Studies conducted in the USA show that there are lower cervical screening rates among immigrant women (especially Somalian women) compared to the general USA population[19]. Carroll et al.reported that Somalian women were not familiar with the tests and concepts used in cancer screening services. Studies have listed the reasons for not participating in cervical screening programs as not having sufficient information, feeling pain, fear or embarrassment, lack of trust in the healthcare system and doctors, and religious beliefs. Religion has an important place in Somalian society.[Table 3] In studies on immigrants, most of the participants stated that they believed that prevention was not possible and that if the disease were to develop, screening would not be helpful and would not change the outcome [20]

Table 1 Cervical Cancer Profile of Somalia

Cervical Cancer Profile: Morbidity and Mortality	
Crude cervical cancer incidence per 100 000 women (2020):	13.2
Age-standardized cervical cancer incidence per 100 000 women (2020):	25.1
Cumulative risk of cervical cancer, ages 0-74 (2020):	2,8%
Cervical cancer deaths (2019):	880

Cervical cancer mortality-to-incidence ratio (2020):	0.77
Population-based cancer registry exists (2023):	No

Table 2 Cancer diagnosis and treatment services generally available (2021)

Cancer diagnosis and treatment services generally available (2021)	
Cancer centre or cancer department at tertiary level:	No
Pathology services (laboratories):	No
Cancer surgery:	No
Chemotherapy:	No
Radiotherapy:	No

Table 3 WHO Cervical Cancer Elimination Strategy Targets for 2030 (World Health Organization - Cervical Cancer Country Profiles, 2021)

Cervical Cancer Elimination Strategy Targets for 2030		
90% of girls fully vaccinated with the HPV vaccine by the age of 15	70% of women are screened with a high-performance test by 35 years of age and again by 45 years of age	90% of women identified with cervical disease receive treatment

2.4 Breast Cancer in Females

Breast cancer is the most frequently diagnosed cancer in women worldwide (154 of 185 countries), increasing in frequency with 1.67 million new diagnoses in 2012 and 2.1 million new diagnoses in 2018[21]. Although the incidence of breast cancer is lower in LICs, the mortality/incidence rate is higher. This can be attributed to various factors, such as limited financial and human resources for effective treatment, and reduced benefit of treatment due to advanced presentation of patients[22].The International Agency for Research on Cancer (IARC) data show that SSA is the most common cancer in women with 94,378 cases and 47,583 deaths reported in 2012 (compared to 93,225 cervical cancer cases). However, with the increasing incidence of cervical cancer in recent years, it is now seen to rank second in most SSA countries[23]. it is considered that the data do not reflect the true incidence due to the lack of screening programs and the low rate of mammography screening in Somalia. As in most SSA countries, the greatest challenge in Somalia is a lack of awareness and knowledge. However, women in the region are at higher risk due to their inability to access high-quality healthcare, fear of stigma, and emotional trauma caused by breast cancer. Documented statistics are not a true reflection of the breast cancer prevalence of most countries, since these countries do not always have well-functioning national cancer registries. This situation is one of the most important problems in breast cancer management. Furthermore, lack of funding, poverty, inadequate health facilities, low staffing, ignorance, and neglect remain the biggest challenges faced in breast cancer management. In addition, effective cancer

management requires radiological services and professionals, as well as oncologists and relevant health professionals who are limited in number in countries.

2.5 Pediatric Cancer Cases

According to the data from the Surveillance, Epidemiology, and End Results Program (SEER), although the most common tumors of childhood are leukemia and those of the central nervous system (CNS) across the world, the most frequently reported in SSA are Kaposi sarcoma, Burkitt lymphoma, retinoblastoma, and visible tumors, such as Wilms[24]. It is noteworthy that in Tanzania there were only a few CNS (4.3%) and leukemia (0.6%) tumors among pediatric cases, constituting 17.5% of cancer cases for the period between 2006 and 2018. Similarly, in our study, the childhood tumors that constituted 5.1% of the cases were mostly lymphomas, Wilms' tumors, retinoblastomas, and tumors of the nasopharynx and thyroid gland. Little is known about pediatric cancer incidences in Africa. Similar to most African countries, the data of this study conducted in Somalia were obtained from hospitalized patient records and were solely based on the pathology findings of biopsy or surgical specimens. Many such cases are referred to an advanced center without a pathological diagnosis due to the lack of pediatric oncology clinics[25]. The most important limitation of this study is that it only included patients who presented to STRTEH, but it is the largest and most comprehensive examination facility in the country. In addition, there are a few other limitations; the exclusion of cases that do not have pathology confirmation could limit the incidence of cancer. The other limitation is that patients travel to other countries for diagnosis and treatment.

3. Life Expectancy in Somalia

The life expectancy of both sexes is 58.3 years (life expectancy at birth, both sexes combined). The life expectancy of females is 60.1 years (life expectancy at birth, females). The life expectancy of males is 56.6 years. Infant mortality in Somalia is 62.8 (infant deaths per 1000 live births). The number of deaths under the age of 5 years is 104.6 (per 1000 live births) [26]. The Ministry of Health in Somalia, under former President Siad Barre's socialist government, centralized the administrative structure of the healthcare sector until the federal government collapsed in 1991[27]. Somalia's public healthcare system was largely destroyed during the ensuing civil war. As with other previously nationalized sectors, informal providers have filled the vacuum and replaced the former government monopoly over healthcare, with access to facilities witnessing a significant increase. Many new healthcare centers, clinics, hospitals, and pharmacies have in the process been established through homegrown Somali initiatives[28]. The cost of medical consultations and treatment in these facilities is low at $5.72 per visit in health centers (with population coverage of 95%), $1.89–3.97 per outpatient visit and $7.83–13.95 per bed day in primary through tertiary hospitals [29]. Estimates of unit costs for patient services for Somalia. World Health Organization. 6 December 2010. Retrieved 12 June 2011.

4. Cancer Statistics in Somalia

The total number of cancer cases in 2020 was 10134, while the total number of cancer deaths in that year was 7439. The future burden will probably be even larger due to the increased prevalence of factors that escalate risks, such as smoking, unhealthy diet, physical inactivity, and fewer childbirths, in economically transitioning countries [30].[Table 4]

Table 4 shows the summary statistics by Globalcan 2020

Summary statistic 2020			
	Males	**Females**	**Both sexes**
Population	7 924 087	7 969 132	15 893 219
Number of new cancer cases	3 723	6 411	10 134
Age-standardized incidence rate (World)	90.8	144.5	118.1
Risk of developing cancer before the age of 75 years (%)	9.8	14.8	12.4
Number of cancer deaths	2 827	4 612	7 439
Age-standardized mortality rate (World)	72.4	108.8	90.9
Risk of dying from cancer before the age of 75 years (%)	7.9	11.8	9.9
5-year prevalent cases	4 704	8 508	13 212
Top 5 most frequent cancers excluding non-melanoma skin cancer (ranked by cases)	Prostate Colorectum Leukaemia Non-Hodgkin lymphoma Oesophagus	Breast Cervix uteri Colorectum Ovary Thyroid	Breast Cervix uteri Colorectum Prostate Leukaemia

4.1 Cancer Risk Factors

Cancer risk factors in Somalia include age, alcohol, chemicals, chronic inflammation, nutrition, hormones, immunosuppression, infectious agents, obesity, radiation, sunshine, tobacco use, and chewing khat. Alcohol usage is increasing due to imports from Ethiopia and Kenya, illegal entry, and inadequate border protection.

Somalia's tobacco consumption, including chewing tobacco, smoking shisha (water pipes), and drinking hot tea, has been linked to an increased risk of mouth cancer, esophageal carcinoma, and other common cancers, despite minimal smoking. Somali people consume red meat due to cheap availability, but lack vegetables and fruits, potentially increasing cancer risk. Urbanization and insecurity are leading to obesity and sedentary lifestyles, affecting sports and recreational activities [31].

5. Cancer Screening Programs

Somalia is in the early stages of developing cancer prevention programs, the most important program being for hepatitis B, which affects 20% of the population. Pap smear screening for cervical cancer is now available, and healthcare facilities screen patients for various types of cancer. Women are encouraged to perform breast self-exams starting at age 20. Private hospitals in Mogadishu and Hargeisa are also conducting examinations and vaccinations for those who test negative. The Somali government lacks financial and human resources to combat cancer with private nonprofit organizations and individuals leading initiatives. The public is unaware of the dangers and benefits of the disease and funding for screening programs is limited. Funders and local philanthropists should be encouraged to participate in these programs.

5.1 Cancer Prevention Programs in Somalia

Currently, no national cancer control program exists, but volunteer organizations like the Somali Cancer Society and Hagarla Institute are providing health education, and vaccinations, and encouraging women to undergo breast self-examination and seek medical attention.

5.2 Challenges and Barriers

The Somalia Ministry of Health faces challenges in preventing and controlling the disease, as the government budget is insufficient for these programs. To address this, massive health education and funding for risk-identifying programs are needed.

6. Cancer Diagnosis and Laboratories

In 2014, Somalia had no proper cancer diagnosis due to the death of one histopathologist. However, progress has been made with six pathology labs in Mogadishu, but no molecular testing, cytogenetic, or genetic testing is available. Somalia has improved its cancer diagnostic accuracy with the introduction of CT and MRI scans in 2010. However, challenges include people's lack of awareness about early diagnosis due to financial constraints, often diagnosed at advanced stages, and stigma surrounding the disease, which some believe is contagious or incurable.

6.1 Treatment and Medical Oncology

Currently, Somalia lacks radiation therapy facilities, functional linear accelerators, gamma knives, cyberknife, brachytherapy facilities, registered radiation oncologists, clinical oncologists, and robotic cancer surgery (hyperthermic intraperitoneal chemotherapy procedures), despite having several oncological surgery centers in Mogadishu and Hargeisa. Somalia does not have a facility for pediatric oncology in the country. No centers are providing comprehensive pediatric cancer treatment. The statistics of pediatric oncology are not available in Somalia. Palliative care service is offered at UNISO Hospital, There is no country-specific palliative care in Somalia.

6.2 Cancer Care at a Reasonable Cost

The cost of effective cancer treatment in Somalia is not even partially covered by international donors or the Somali government. the burden of problems related to cancer treatment falls on patients and their families. Currently, the Somali government has no plans to address the rising costs associated with cancer treatment and the increasing use of costly drugs such as immunotherapy, radiation, and other Cancer Drugs.

6.3 Advantages and Drawbacks

After a terrible civil war that lasted thirty years, Somalia is now recovering. Since this war destroyed all of the country's medical facilities, the health system in the country could not be rebuilt. This healthcare system has an impact on cancer care in the country. UNISO Hospital in Mogadishu, Somalia, is the only facility in the country that offers cancer treatment. The only services offered by this facility are surgery and chemotherapy. This facility does not provide radiation therapy services. Somalis have a very generous and giving nature. They are compassionate and friendly

towards the sick. In Somalia, they cover the costs of cancer treatment. The majority of Somali cancer patients travel to India for medical care. Even considering other countries like Malaysia, Turkey, Thailand, Egypt, China, and Saudi Arabia, they are estimated to spend more than $1 billion in India alone. There is a severe lack of human resources for the treatment of cancer in Somalia. There is only one medical oncologist in the country and a few nurses trained by him. Chemotherapy, surgery, biopsy, histopathology, and imaging services are among the specialties cancer patients in Somalia can access. Cancer insurance is not public, Luckily there is outside help. Patients and their families are responsible for the costs.

6.4 Cancer patients seeking medical care overseas.

Once cancer is diagnosed at local diagnostic centers, the majority of Somalis travel abroad for treatment. India, Thailand, Malaysia, China, Egypt, the United Arab Emirates, Saudi Arabia, Kenya, Ethiopia, and Turkey are among the top destinations for medical care.

7. Research/Collaboration

One of the major heralds of cancer research in Somalia is the lack of meticulous cancer registries. Like other parts of the world, cancer registration needs to deal with issues related to the accuracy of diagnosis, duplication of entries due to patient referral, abandonment of treatment, and accurate registration of death certificates. Areas of research that deserve special consideration include cost-effectiveness of cancer care and outcome studies, Lack of funding is a significant barrier to research in Somalia.

7.1 Limited Resources

The uninformed assumption would be that all that is required for cancer treatment is access to direct treatment modalities, which are scarce in Somalia and include chemotherapy medications, surgical capability, inpatient wards, and radiation units. But cancer treatment is a drawn-out, multidisciplinary procedure.

8. The Prospects for Cancer Treatment in Somalia.

Somalia's cancer care has a promising future because more medical professionals want to specialize in treating cancer, and more private investors want to fund the country's healthcare system overall and in the field of cancer care specifically. Furthermore, it is hoped that as the Somali government grows stronger, it will take a more active role in cancer care in the country.

8.1 ways to enhance Somalia's cancer treatment system.

- Somalia needs to train more medical professionals to deal with problems related to cancer treatment
- For Somalia to provide basic cancer treatment and diagnostic services, more resources are needed, such as screening and prevention programs.
- Creation of cancer treatment facilities, including radiation therapy, cancer treatment, and palliative care facilities
- Research and clinical trials are needed to determine the most common cancers in the country, their risk factors, and the distribution of cancers across the financial spectrum.

8.1.1 hababka kor loogu qaado habka daaweynta kansarka ee Soomaaliya (Somali Translation)

- • Soomaaliya waxay u baahan tahay inay tababarto xirfadlayaal caafimaad oo badan si ay ula tacaalaan dhibaatooyinka la xiriira daaweynta kansarka
- • Si ay Soomaaliya u bixiso adeegyada aasaasiga ah ee daaweynta kansarka iyo ogaanshaha, waxaa loo baahan yahay ilo badan, sida barnaamijyada baaritaanka iyo ka hortagga.
- • Abuuridda xarunta daaweynta kansarka, oo ay ku jiraan daaweynta shucaaca, daaweynta kansarka, iyo xarunta daryeelka palliative-ka
- Cilmi-baaris iyo tijaabooyin caafimaad ayaa loo baahan yahay si loo go'aamiyo kansarka ugu badan ee dalka, qodobbada khatarta ah, iyo qaybinta kansarrada dhammaan noocyada maaliyadeed.

9. Conclusion

Cancer is a significant health problem in Somalia. The number of cancer cases is increasing in Somalia. There is no national cancer control program in this country and cancer is a neglected public health problem. Esophageal cancer (EC) is the most common cancer in Somalia and affects both male and female patients equally. Squamous cell carcinoma is the most common histologic type and peaks in the fifth decade of life. Liver cancer is the second most common cancer overall and occurs more often in men. The second most common cancer in women is cervical cancer. In women, breast cancer ranks third in terms of overall incidence. The healthcare system in Somalia has been lost along with cancer treatment services. The increasing number of cancer cases in Somalia poses a challenge for the country, which currently lacks an efficient cancer care system. Policies and healthcare professionals attempting to care for their patients have a responsibility to acknowledge and address each of these issues. Recommended remedies include addressing shortages of necessary medications, improving facility infrastructure, and changing evidence-based practices to create affordable, individualized treatment plans that are both safe and effective.

List of abbreviations

EC Esophageal cancer
CNS Central Nervous System
MRI Magnetic resonance imaging
CT Computed tomography
WHO World Health Organization
LMICs Low- and Middle-income Countries
UNISO University of Somalia
SEER Surveillance Epidemiology End Results Program
HCC Hepatocellular Carcinoma
WTO World Trade Organization
PRISMA Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SSA Sub-Saharan Africa

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Conflicts of interest

The authors declare that they have no conflict of interest.

Authors Contribution

Dr. Sakarie Mustafe Hidig Coined the idea and wrote the original manuscript. Dr. Mohamed Mohamoud Adan has Revised the manuscript. All authors approved the submitted version.

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