Ethiopian Journal of Medical and Health Sciences
2023, Volume 3, Issue 2
https://journals.hu.edu.et/hu-journals/index.php/ejmhs

Open Access
ISSN (online): 2789-7087

Original Article

Pattern of genitourinary tract cancers in southern Ethiopia: A retrospective document review

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Abstract

Background: Genitourinary tract (urologic) cancers are substantially increasing and become a major public issue in both industrialized and developing countries. Despite the increasing burden of genitourinary tract cancer (GUTC), inadequate attention is being given for early detection and treatment services due to insufficient evidence on the burden of urologic cancer cases in Ethiopia.

Objective: To describe the epidemiologic trends of genitourinary cancer in southern Ethiopia retrospectively at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013 and 2019.

Methods: A cross-sectional retrospective chart review was conducted among patients with a diagnosis of genitourinary cancer between 2013 and 2019 at HUCSH. The full review of registration record (logbook) at the unit of oncology and pathology was done and yielded a total of 207 GUT cancer cases in the given above years. The data were collected using a checklist from February to May 2020. Epi-data version 3.1 was used to enter data, and SPSS version 20 was used to analyze it. We did a descriptive and trend analysis.

Result: A total of 207genitourinary tract (GUT) cancer cases were identified at HUCSH. Among all, 165 (79.1%) were male, with male to female ratio of 3.9:1. The overall GUT cancer caseload was increasing year to year and doubled in 2019 compared to 2013 in the majority of the cancer types in this study. The most prevalent cancer cases were bladder cancer 96 (46.4%) and prostate cancer 44 (21.3%).The average time between the onset of symptoms and the diagnosis of bladder cancer was 18 months. In all cases of the identified GUT cancer, patients were diagnosed mostly at advanced stage III and IV. The trends of all GUT cancer were progressively increasing year to year.

Conclusion: The GUT cancer has been a great burden and highly increasing in the last 7 years with high incidence of bladder cancer types. Routine awareness creation, early detection, registration and follow up are critical to prevent or to treat cancer cases early.

Keywords: Genitourinary tract, bladder, prostate, renal cancer, urologic cancer, Ethiopia

Introduction

In 2013, there were 2.1 million cases of kidney, bladder, and prostate cancer worldwide, a 2.5-fold increase since 1990. In 2016, there were 2.3 million more new cases of urologic cancer diagnosed, up almost 2.2 times in the previous 16 years. Additionally, there were 1.9 more urologic cancer deaths overall in 2016 (1, 2) . From 1990 to 2013, there was a 1.6-fold rise in mortality (2). The results suggest that between 1990 and 2026, worldwide trends in prostate cancer fatalities are anticipated to increase; while bladder, kidney, and prostate cancers could all experience significant increases fatalities or prevalence in both sexes. Between 1990 and 2026, the number of bladder cancer deaths will raise simultaneously in low socio-demographic index (SDI) nations (1). While testicular cancer mortality is anticipated to rise from 2016 to 2026, the incidence of testicular cancer cases will remain steady in low-SDI and low-middle SDI countries (1).

According to some studies, the age group 60 years and over accounted for 82% of new cases of urological cancer in 2013, with prostate cancer being the most common type of the disease among men worldwide (1, 2). Male urological cancers were found to be predominant, with a male-to-female ratio of 16:1, according to a Nigerian study. Others such as the bladder 36%,kidney 5.2, testes1%, penis 0.7%, urethra 0.4% and ureter 0.1% contributed accordingly (3). The number of deaths from GUT cancer grew by 47.4%, according to an Ethiopian study on the burden of cancer between 2000 and 2016(4). Prostate cancer deaths increased by 97%, kidney deaths by 73%, and bladder deaths by 51.8%, but testicular cancer deaths decreased by 6.6%. Between 2000 and 2016, the burden of cancer has risen (4). Despite the rising burden, most African countries generally have few cancer control programs and few early detection and treatment facilities are available (5). Therefore, the purpose of this study was to describe the epidemiologic trends of GUT cancers in the southern region of Ethiopia which will be a great input for the future optimization of the existing cancer control program.

Methods and materials

A retrospective cross-sectional study design was used among cancer cases treated at Hawassa University Comprehensive Specialized Hospital (HUCSH). Hawassa is located in southern part of Ethiopia Hawassa City Administration 275 km from the capital city of the country (Ethiopia). The HUCSH serves almost 18 million people who live in the southern part of the region and Oromia. The HUCSH offers oncology services as well as general and specialized healthcare. In the southern portion of Ethiopia, the hospital is the only cancer care providing center. All cancer patients treated with cancer cases in HUCSH between 2013 and 2019 were included in this study. The data were collected from February to May 2020. A thoughtful of review was carried on the registration record (Log-books) in both oncology and pathology units using a standardized checklist. Data were entered using epi-data version 3.1 and analyzed by SPSS version 20. Descriptive statistics and trend analysis were performed and illustrated in tables and graphs. For more detail, the methodology used to conduct this study which is a component of a larger study on the economic burden of diseases in HUCSH, southern Ethiopia, was published elsewhere in 2021(6).

Results

A total of 207 genitourinary tract (GUT) cancer cases were identified at HUCSH from all cancer cases registered in the last seven years prior to the study period. The most prevalent cancer cases were bladder cancer 96 (46.4%) and prostate cancer 44(21.3%). Renal 29(14%) and Testicular 29(14%) cancers were in the third position of the total GUT cancer cases. Figure 1. The majority of cases were among age group of more than 60 with mean (SD) age of participants 54 (18.8) ranging from 15 to 96. Majority (80.2%) of them were married and more than half (53.1%) were from Oromia region (Table 1).

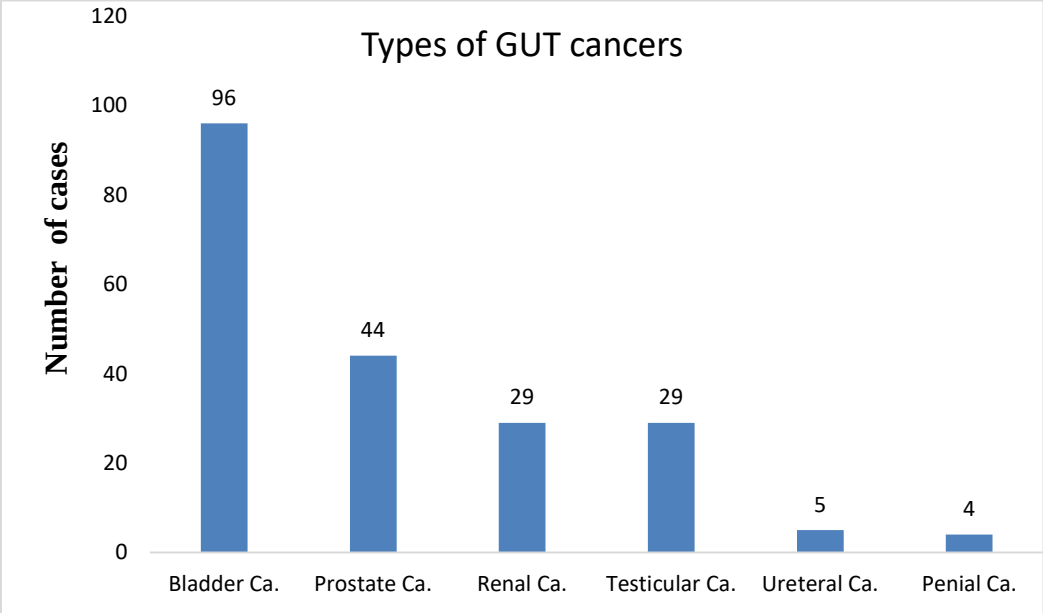

Figure 1: Types of genitourinary tract (GUT) cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019.

The majority ,79.2%, of the bladder cancer was among males and on the contrary renal cancers, 69%, were very common among females with female to male ratio of 3.8:1 and ureteral cancer was also common among males (1.5:1 ratio) (Table 2).

Distributions of GUT cancer by age of the patients

Bladder cancer was common at the age between 6th and 7th decades and prostate cancer common at 7th decades of age. From the Figure 2, both bladder and prostate cancer reach the maximum after 7th decades. Testicular cancer is more common at young age's, during the 2nd and 3rd decades of life (Figure 2).

Trends of GUT cancer by year of occurrence

GUT cancer caseload was increasing year to year in this study. The numbers of cancer cases were almost double in 2019 compared to 2013 in the majority of the cancer types (Figure 3).

Table 1: Socio-demographic characteristics GUT cancer patients at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019 (n=207)

Variable	Category	Frequency	Percent
Age	<20	8	3.9
	20-39	40	19.3
	40-59	59	28.5
	≥60	100	48.3
Sex	Female	42	20.3
	Male	165	79.1
Marital status	Married	166	80.2
	Single	23	11.1
	Widowed	13	6.3
	Separated	3	1.4
	Divorced	2	1
Living	SNNPR	97	46.9
Address	Oromia	110	53.1

Table 2: Distribution of GUT cancer by sex at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019 (n=207)

Types of cancer	Frequency	
	Male	Female
Bladder Ca.	76(79.2%)	20(20.8%)
Prostate Ca.	44(100%)	-
Renal Ca.	9(31%)	20(69%))
Testicular Ca.	29(100%)	-
Ureteral Ca.	3(60%)	2(40%)
Penial Ca.	4(100%)	-
Total	165(79.7%)	42(20.3%)

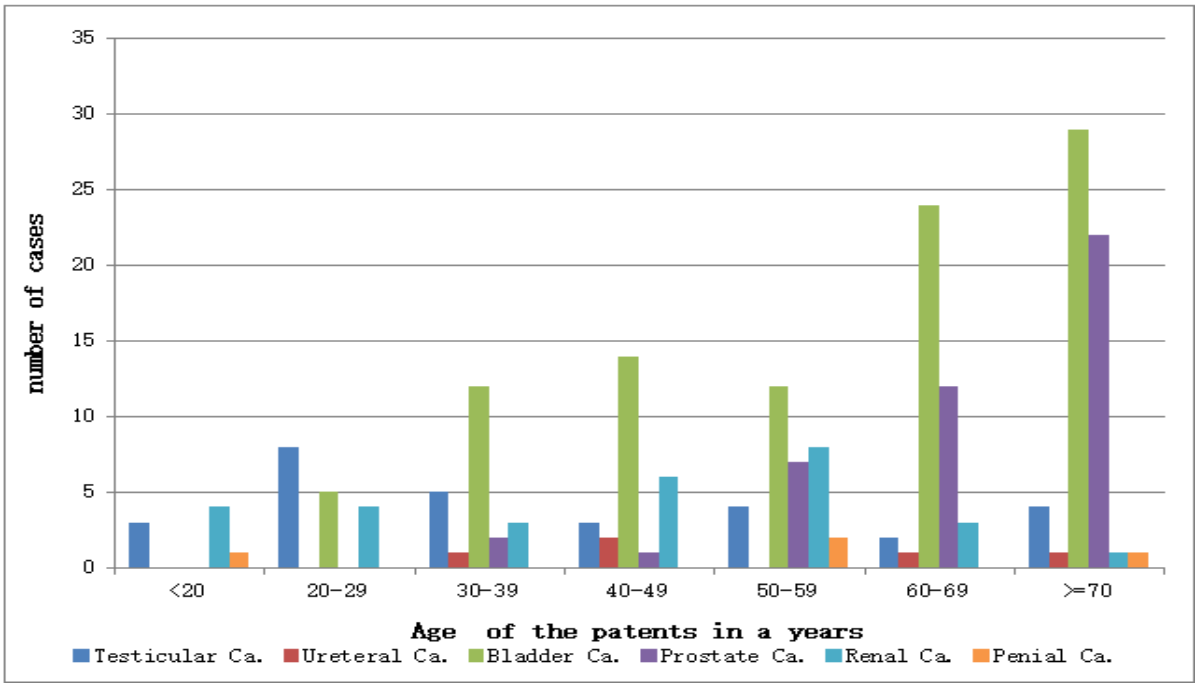

Figure 2: Distributions of GUT cancer by age of the patients at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019.

The average time between the onset of symptoms and the diagnosis of bladder cancer was 18 months. Cystoscopy biopsy was used to diagnose more than half of bladder cancer patients (60.4%). Urothelial carcinoma (91.4%) was the most common histologic type. Of this, 33(62.3%) were high grade urothelial carcinoma. Nearly three fourth of the patients had advanced cancer (Stage III & IV) (Table 3).

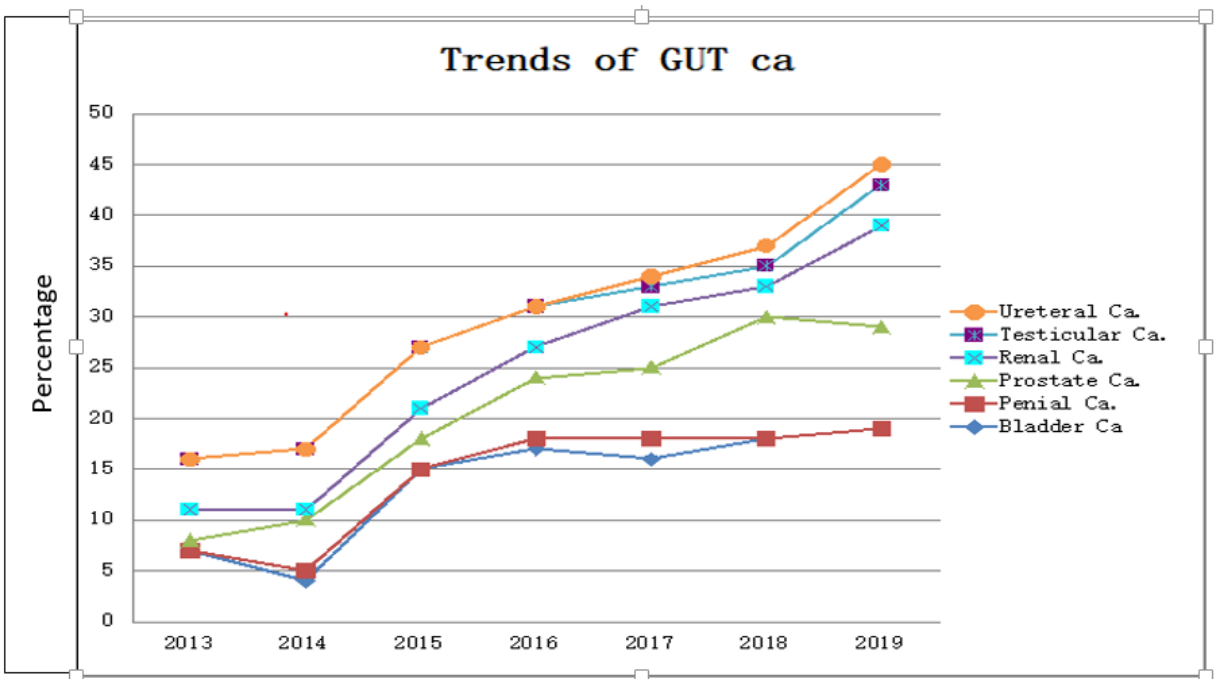

Figure 3: Trends of GUT cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019.

Table 3: Characteristics, stage, and histological characteristics of bladder cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019 (n=96)

Variable		Frequency	Percent
Duration of symptoms	≤ 1 year	23	24
	13 months-2 years	61	63.5
	>2 years	12	12.5
Means of diagnosis	Cystoscopy biopsy	58	60.4
	Clinically	29	30.2
	Not stated	9	9.4
Histologic types from Cystoscopy biopsy(n=58)	Urothelial carcinoma	53	91.4
	Squamous cell carcinoma	5	8.6
Clinical Stage	Stage I	7	7.3
	Stage II	9	9.4
	Stage III	57	59.3
	Stage IV	14	14.6
	Not stated	9	9.4
Tumor behavior of urothelial carcinoma (n=53)	High grade	33	62.3
	Low grade	17	32.1
	Not stated	3	5.6

The average time between the onset of symptoms and the diagnosis of prostate cancer was 26 months. Majority (72.7%) of the cases were diagnosed clinically. Adenocarcinoma was the only identified histology from biopsy. Majority of the cases of prostate cancer were diagnosed at advanced stage III & IV (Table 4).

Table 4: Characteristics, stage, and histological characteristics of prostate cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019 (n=44)

Variable		**Frequency**	**Percent**
Duration of symptoms	≤ 1 year	7	16
	13 months-2 years	20	45.4
	>2 years	17	38.6
Means of diagnosis	Clinically	32	72.7
	Biopsy	8	18.2
	Not stated	4	9.1
Histologic types from biopsy(N=8)	Adenocarcinoma	8	100
Clinical Stage	Stage I	1	2.3
	Stage II	2	4.5
	Stage III	11	25
	Stage IV	27	61.4
	Not stated	3	6.8
Tumor behavior/Gleason score (N=8)	≤6	1	12.5
	7	3	37.5
	8	2	25
	9 or 10	2	25

The average time between the onset of symptoms and the diagnosis of renal cancer was 29 months. Majority 19 (66%) of the cases were diagnosed clinically and nephrectomy biopsy was used to diagnose nearly for one fourth of the cases 7 (24%). Of this nephrectomy biopsy, 71.4% were a clear cell histologic type. Of this, 3(43%) were high grade. Nearly three fourth of the patients had advanced cancer (Stage III & IV) (Table 5).

The average time between the onset of symptoms and the diagnosis of testicular cancer was 13 months. Majority 21 (72.4%) of the cases were diagnosed by orchidectomy biopsy. Of this orchidectomy biopsy, 13(61.9%) were on-seminoma germ cell tumor by its histologic type. Of the total, 21 (72.4%) of the patients had advanced cancer (Stage III & IV) (Table 6).

Treatment

Early-stage bladder cancer patients (Stage I and II) were treated with transurethral resection of bladder tumor (TURB) and followed by chemotherapy, cisplatin 70mg/m2 IV day one and Gemcitabine 1000mg/m2 IV day one and day eight every 21 days for four to six cycles. After they completed their chemotherapy referred to Tikur Anbessa Specialized Hospital (TASH) for radiotherapy services as there was no radiotherapy in HUCSH and also for further surgical evaluation and management.

Locally advanced bladder cancer patients (stage III) were managed by chemotherapy, cisplatin 70mg/m2 IV day one and Gemcitabine 1000mg/m2 IV day one and day eight every 21 days for four to

Table 5: Characteristics, stage, and histological characteristics of renal cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019 (n=29)

Variable		Frequency	Percent
Duration of symptoms	≤ 1year	6	20.7
	13months-2 years	9	31
	>2 years	14	48.3
Means of diagnosis	Clinically	19	65.5
	Nephrectomy biopsy	7	24.2
	Not stated	3	10.3
Histologic types from Nephrectomy biopsy (n=7)	Clear cell	5	71.4
	Non-clear cell	2	28.6
Clinical Stage	Stage I	1	3.5
	Stage II	5	17.2
	Stage III	6	20.7
	Stage IV	13	44.8
	Not stated	4	13.8
Tumor behavior from Nephrectomy biopsy (n=7)	High grade	3	43
	Low grade	2	28.5
	Not stated	2	28.5

Table 6: Characteristics, stage, and histology of testicular cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019 (n=29)

Variable		Frequency	Percent
Duration of symptoms	≤ 1 year	13	44.8
	13 months-2 years	12	41.4
	>2 years	4	13.8
Means of diagnosis	Orchidectomy Biopsy	21	72.4
	Clinically	7	24.1
	Not stated	1	3.5
Histologic types from orchidectomy biopsy (n=21)	Pure seminoma	8	38.1
	Non-seminoma germ cell tumor	13	61.9
Clinical Stage	Stage I	2	6.9
	Stage II	5	17.2
	Stage III	14	48.3
	Stage IV	7	24.1
	Not stated	1	3.5

six cycles and then referred to TASH for radiotherapy and for further surgical evaluation and management. While, metastatic bladder cancer patients (stage IV) were treated with systemic chemotherapy alone, cisplatin 70mg/m2 IV day one and Gemcitabine 1000mg/m2 IV day one and day eight every 21 days for four to six cycles. Early-stage prostatic cancer patients were managed by surgery, prostatectomy while locally advanced prostatic cancer patients (stage III) were treated by bilateral orchidectomy and then referred to TASH for radiotherapy. Metastatic prostatic cancer patients were treated with bilateral orchidectomy and then referred to TASH for radiotherapy for bone lesion. Stage I and II renal cell carcinoma patients were managed by radical nephrectomy. However, stage III and IV renal cell carcinoma patients were given supportive or palliative care services. Nearly all testicular cancer patients were treated with chemotherapy which is BEP regimen (Bleomycin 30 units weekly, Etoposide 100mg /m2 IV daily for 5 days and cisplatin 20mg /m2 IV daily for 5 days every 21 days) for four to six cycles except few of stage III patients underwent retroperitoneal lymph node dissection along with bilateral orchidectomy

Discussion

This study was aimed to describe epidemiologic trends of genito-urinary cancers in southern Ethiopia. In this study, a total of 207 genitourinary tract cancers (GUT) were involved. Of which bladder cancer accounted 96(46.4%).As evidenced by different studies(7), nearly 80% of the GUT were occurred in males, consistently to studies (8-10), the majority 79% of the bladder cancer was among males in relation to schistosoma infections which are responsible for a high incidence of bladder cancer in middle and eastern Africa(11), while it was rare case among male and slightly higher among females in developed countries like United States(12). In the contrary to the truth, one of African study approved that the estimated prevalence of bladder cancer was a few (13) which could be due to limited data related to poor registration system(14, 15).

Studies indicate that there is limited awareness of the epidemiology of prostate cancer in Sub-Saharan Africa (SSA) (16). A study conducted in Ethiopia confirmed that the prevalence of prostate cancer is relatively low in the country (4). However, prostate cancer accounts for 44 cases (21.3%) of genitourinary (GUT) cancers, aligning with findings that show the burden of prostate cancer is rising, with rates increasing by 20–36% (17). This is a significant increase compared to previously reported rates of 5.4% to 12.59% (7) and 9.4% (15). The rising incidence of these cancers is attributed to lifestyle changes, increased awareness of symptoms, and improved diagnostic practices, which are influenced by urbanization and economic development (5, 18). It was found to be very low in comparison to Burkina Paso study with reported cases of (72.68%)and Korean study (44.8%) (19,20). The variations of the prevalence of prostate cancer could be due to geographical variations and national human growth index and aging (2, 17, 21, 22).

In our study, prostate cancer was more prevalent at 7^{th} decades of age which is in line with Korean study (20). However, in another study the prevalence of prostate cancer was below of this finding (66.73 years) (23). Similarly in Italian study, it was prevalent among age group of 65-69 (24) and it was high in between 65-70 years (24).Literatures approved that prostate cancer is a disease of advancing age (26). This might be as individual's age increase, the risk of developing cancers such as prostate, bladder, and kidney cancer increases due to cumulative exposure to carcinogens and the natural decline in the body's immune response. Additionally, age-related changes in hormone levels, particularly testosterone, can influence the growth of

prostate cancer. The discrepancy of the findings could be due to socio-economic variation and the study design used in the above referred studies. For instance, the Italian study design was case control, while this study focused on record review (24). Besides, the Malawi study accommodated only one year data from surgical sides of both clinics and hospitals (23).

Renal 29(14%) and Testicular 29(14%) cancers were in the third position of the total study population. The majority of the cases were stable during study period. One of the earliest study conducted in Iran clearly stated that bladder cancer was the most common urological cancer (7) and it was highly prevalent among men (87.5%vs12.5%) (8). This study showed that bladder cancer was common at the age between 6th and 7th decades with male to females ratio of (79.2%vs20.8%).This finding was consistent with the findings of different studies (9, 13, 27). However, it was too earlier (49.73±1.5) in the study conducted in Tikur Anbessa hospital. The difference of age range could be due to small sample size (97) of previous study (28). This may also be attributed to the high prevalence of schistosomiasis in southern Ethiopia. Similarly, another earlier study identified that the risk of bladder cancer was very low in both male and female before age of 75 years (29). This could be due to the exposure for risk factors before 20 years may be too low. Besides, it was not familiar to conduct routine screening for bladder cancer (30, 31).
Testicular cancer is more common at younger, 2nd and 3rd decades of age. In the finding of Malawi study, there was at least 10 years earlier incidence of prostate cancer (23). Most likely because of substantial regional differences in the prevalence and distributions of social, cultural, and other environmental factors, including many of the major known risk factors for cancers, contrasting levels of economic development, and differences in access to health care and infrastructure that are not captured by economic development. The study briefly described the trend of selected cancers with high burden, known preventive measures, or striking regional variations (5).

The incidence of GUT cancer was increasing year to year in this study. The numbers of cancer cases were almost doubled in 2019 compared to 2013 in the majority of the cancer types (5). This might be, advances in medical technology and increased awareness have led to better screening and diagnostic methods. This indicates that additional cases that might not have been recorded in prior years are being found. Changes in eating patterns, such as consuming more processed foods and low-fiber meals, may raise the risk of GUT cancers. In addition, the number of cancer cases may have increased over time due to sedentary lifestyles and greater exposure to environmental carcinogens such chemicals and pollution. This description is supported by the findings of different studies. One of the Ethiopian evidence summarized that generally the burden of cancer was increasing remarkably through periods (4). This makes it too difficult to prevent and early treat cancer cases timely in low and middle income countries (5). The disease prevention strategies were not give due attention for non-communicable diseases in the last decades in low income countries (32, 4)

Conclusion

The GUT cancer has been a great burden and highly increasing in the last 7 years with high incidence of bladder cancer types. Routine awareness creation, early detection, and strong consideration for NCDs; registration and follow up for cancer cases are critical to prevent or to treat cancer diseases early.

Acknowledgement

The authors wish to extend their sincere gratitude to Hawassa University College of Medicine and

Health Sciences, specifically the School of Public Health, for facilitating this study. We would also like to recognize the invaluable support of the data collectors and the staff in the records office during the data collection phase.

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of Hawassa University, college of medicine and health sciences (reference number: IRB/027/11).
An official letter of permission was written to the oncology department and records management units. All data utilized in this study were sourced from secondary records, ensuring there was no direct interaction with patients. To safeguard the privacy and confidentiality of sensitive information, each patient's name was anonymized using a coding system.

Data availability statement

The datasets generated and/or analyzed during this study are available upon reasonable request from the corresponding author.

Conflicts of interest

The authors declare that they have no competing interests.
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.Funding statement

No funding was received for this research.

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