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Original Article

Trends of gastro-intestinal tract cancer between 2013 and 2019 in Southern Ethiopia: A retrospective record review

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Abstract

Background: Gastrointestinal tract (GIT) cancer is a serious public health concern in both the industrialized and developing nations. In the world today, it is one of the major causes of morbidity and mortality. However, there was insufficient evidence regarding the burden of GIT cancer in Ethiopia and the study area. The present study aimed to assess trends of GIT cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013 and 2019.

Methods: A retrospective record review was conducted to determine the trends of gastrointestinal cancer. A review of all patients' records with a diagnosis of cancer between 2013 and 2019 at HUCSH was conducted by trained data collectors. The logbooks at the units of oncology and pathology yielded a total of 3002 complete records of cancer cases. The data was collected using a checklist from February to May 2020. Descriptive analyses were conducted and presented using tables and figures.

Result: Of a total, 720(24%) gastrointestinal tract cancer cases were identified at HUCSH between 2013 and 2019. The three most frequent forms of GIT cancer were gastric (35.7%, n=257), esophageal (34.1%, n=245) and colorectal (28.3%, n=204). More than half of the cases were male 391 (54.3%) with a male-to-female ratio of 1: 0.84. The majority of the cases came from Oromia (52.6%, n=379), and Southern Nation Nationalities and Peoples (46.7%, n=336) regions. There was a speedy increase in the number of cases though the years. In comparison to 2013, there were more than five-fold increases in all forms of GIT cancers in 2019.

Conclusion: The overall burden and trends of gastrointestinal cancer is highly increasing from year to year. Educating the public about healthy lifestyle changes and raising awareness of the problem can lessen the gastrointestinal cancer burden. Routine registration is also important to monitor and regulate the disease's progress.

Keywords: epidemiology, cancer, gastric, esophageal, colorectal, Ethiopia

Introduction

For years, the burden of cancer has been migrating to less developed countries, which now account for the majority of cancer-related fatalities worldwide (1-3). Sub-Saharan African countries, especially Ethiopia, are currently facing the burden of cancer (4).

Gastrointestinal (GI) cancers account for more than a quarter (26%) of global cancer incidence and more than one-third (35%) of all cancer-related fatalities (5). Thus, GI cancers have been a huge medical and financial burden all over the world. The prevalence of GI cancers is expanding regardless of a country's economic status, medical circumstances, or public health situation (6).

A comprehensive analysis of the burden of gastrointestinal tract (GIT) cancer found that among patients diagnosed with GIT cancers, gastric cancer was the most common (55.6%), followed by small bowel cancer (31.8%), and colorectal cancer (6.0%) (7-10). Similarly, according to a study on the worldwide burden of GIT cancer, gastric cancer is the fifth most commonly diagnosed cancer and the third-leading cause of cancer death and it is the primary cause of almost one million new cases of cancer and nearly 800,000 fatalities (11).

In contrast, colorectal cancer continues to be the most often diagnosed GIT cancer, with 1.8 million cases and 881,000 deaths globally in 2018 representing one in ten cancer cases and fatalities, with incidence rates varying by as much as tenfold among different parts of the world. Other studies (12, 13) have found that colorectal cancer ranks second in terms of fatality but third in terms of incidence. Between 2007 and 2017, incidence of GIT increased overall by 25%, with population growth accounting for 13%, population changes accounting for 19%, and declining age-specific rates accounting for 6%. An epidemiological study found a male-to-female ratio of 1:0.85 among patients with GIT cancer who had been diagnosed within the previous 12 years (12).

Colorectal cancer is one of the main causes of cancer death in women, while liver and stomach cancer are the top causes of cancer death in men (3). In developed countries, the incidence rate is almost four times higher than in developing countries, but there is less heterogeneity.

Furthermore, colorectal cancer is the most common gastrointestinal cancer in Ethiopian adults (5.7%), with women accounting for around two-thirds of reported annual cancer fatalities (3). The patients' ages range from 23 to 76, with a median of 52. While the majority of patients were under the age of 45, only one in ten were over the age of 65 (14, 15).

Esophageal cancer affects more than 450,000 people worldwide, and the incidence rate is rapidly increasing. Getting appropriate information about esophageal and other GIT malignancies, however, is quite difficult (16). According to World Health Organization (WHO) research from 2008, the epidemiology of cancer in Ethiopia is sparse. Besides, there is a lack of completeness in the institutional documentation and reporting of cancer-related mortality and morbidity (17, 18). Cancer data from Hawassa University Comprehensive Specialized Hospital or from southern Ethiopia has not been reported. There was no previous cancer registry. As a result, the purpose of this research was to evaluate the trends of GIT cancer between 2013 and 2019 in southern Ethiopia.

Methods and materials

Study setting, design and period

A retrospective review of the records of cancers cases diagnosed between 2013 and 2019 was conducted. The research was carried out at the Hawassa University Comprehensive Specialized Hospital (HUCSH), which is located in the Hawassa City Administration in southern Ethiopia. The hospital started service in 2006 and now serves roughly 18 million people from all across Sidama, Central Ethiopia, Southern Ethiopia, Oromia, and other regions with a variety of outpatient and inpatient services. This hospital is the only hospital providing cancer diagnosis and treatment in the southern part of the country. Currently, the institution treats cancer patients with chemotherapy and hormonal therapies. Patients are referred from nearby health centers, and primary and general hospitals to HUCSH. The oncology department is staffed by senior oncologists, general practitioners, nurses, and subordinate staff. Almost all solid cancer cases are treated in the department, which offers both outpatient and inpatient services.

Study population and sampling procedure

All records of cancer patients treated for cancer in HUCSH between 2013 and 2019 were included in the study. Records with incomplete information were excluded.

Data collection and quality assurance

The data were collected from February 2020 to May 2020 using a checklist. Throughout the study period, patients with a cancer diagnosis were identified using the oncology unit registration book. Their hospital records were accessed using the medical registration number (MRN) from the registration book. The hospital chart, which is often stored in the patient archives of the hospital, contains information about the patient, their medical history and physical examination, lab findings, treatment choices, drugs, and treatment outcomes. Using a data collection tool created to collect consistent data from the patients' charts for this study, pertinent information was collected from the charts. Demographics, clinical symptoms, diagnosis, kind of cancer, stage of cancer, treatment, and results were among the data gathered. Four trained oncology nurses extracted the data. The investigators closely supervised the data extraction procedure.

Data entry and analysis

From all cancer patient medical records, gastrointestinal cancers were retrieved. EpiData version 3.1 was used to enter data, which was subsequently exported to IBM SPSS version 20 (IBM Corporation, Armonk, NY, USA) for additional processing and analysis. Finally, frequency and percentage were computed and trend analysis was performed and illustrated in tables and graphs.

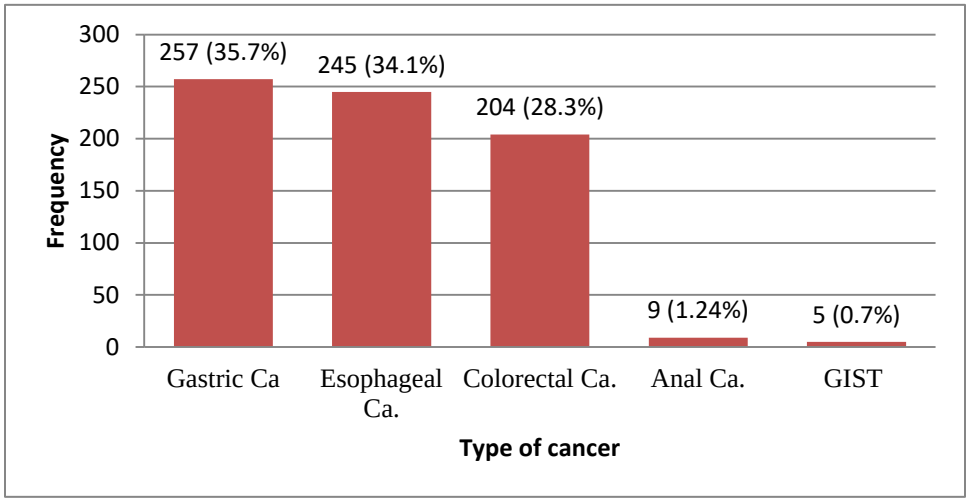
Results

Epidemiologic distributions of cancer

Of the total of 3002 patients with comprehensive records as new cancer cases between 2013 and 2019, 720 (24%) were diagnosed with gastrointestinal cancer. Of this, 391(54.3%) were male patients and 329(45.7%) were female patients. Most of the cases were from Oromia region (52.6%, n=379), and from the then Southern Nations, Nationalities, and Peoples Region (SNNPR) (46.7%, n=336), and the rest from other regions. The three most frequent forms of GIT cancers were gastric (35.7%, n=257), esophageal (34.1%, n=245) and colorectal (28.3%, n=204) (Figure 1). Besides, esophageal and gastric cancers were high in patients from Oromia region and colorectal

cancer was more frequent among patients from SNNPR.

This study showed that gastric and esophageal cancers were found to be dominant in the 4th and 5th decades of age, while colorectal cancer was very common at the 3rd and 4th decades of age (Figure 2). The overall male-to-female ratio of gastrointestinal cancer was 1:0.84. Esophageal and anal cancers were more common among females with a ratio of 0.88:1. Gastric and colorectal cancers were more common among males than females with a ratio of 1: 0.61 and 1:0.78 (Figure 3).



GIST: Gastrointestinal stromal tumor

Figure 1: Distribution of GIT cancers at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013 and 2019.

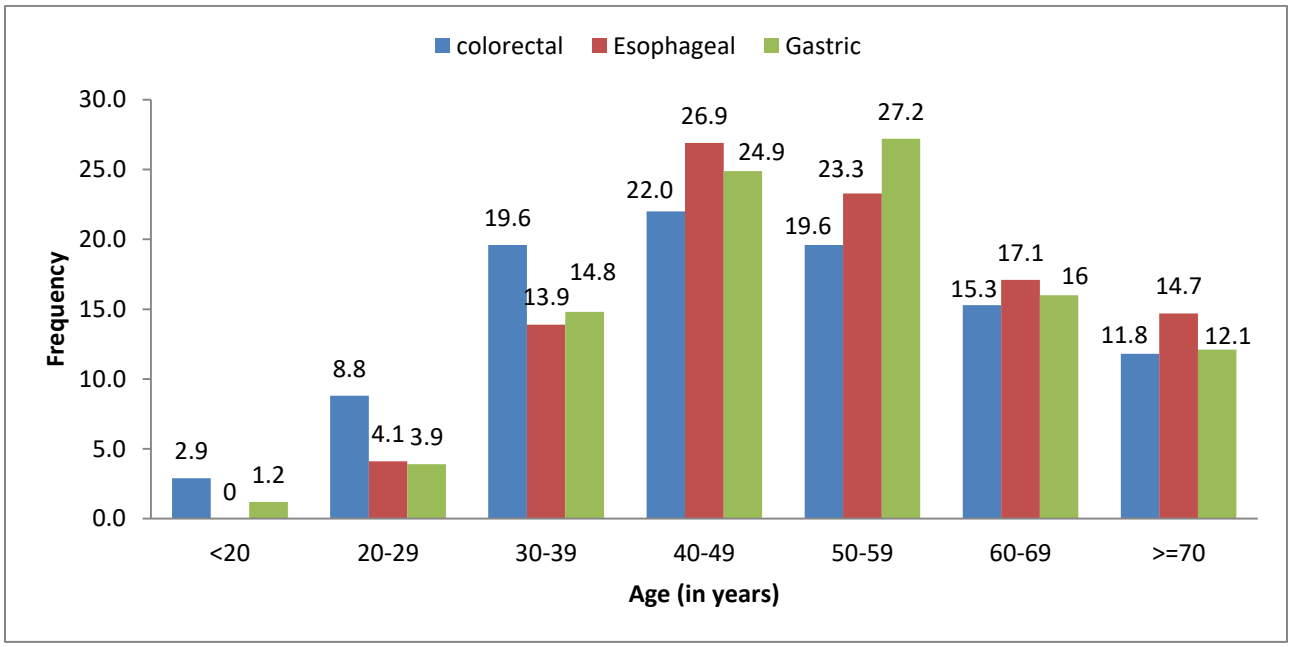
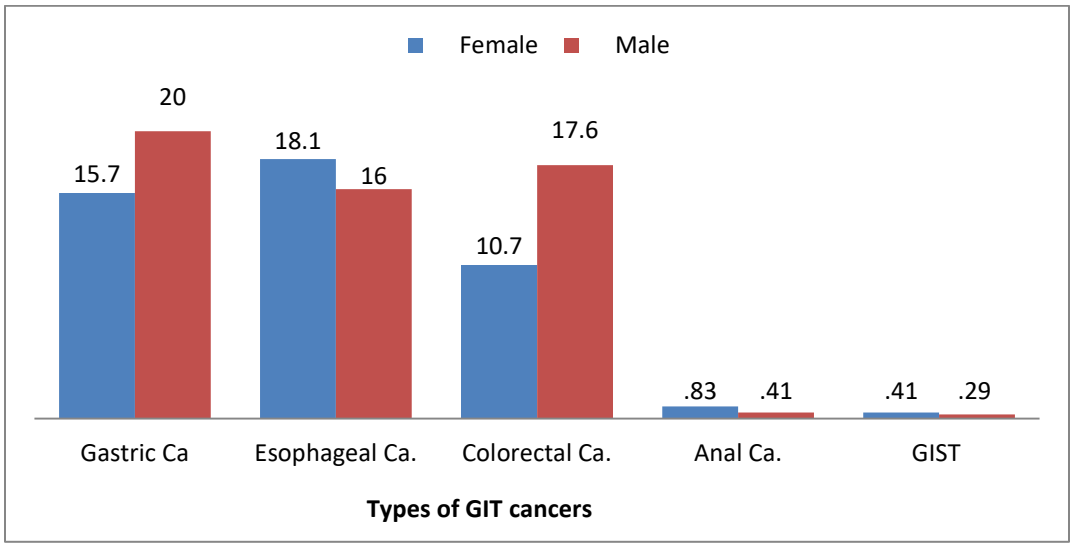


Figure 2: Distribution of GIT cancers by age in years at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019.



GIST: Gastrointestinal stromal tumor

Figure 3: Distribution of GIT cancers by sex of the patients at Hawassa University Comprehensive Specialized Hospital (HUCSH) form 2013-2019.

Histological characteristics, stage and treatment of GIT cancer

Gastric cancer was almost entirely adenocarcinoma, with only 5% of cases being squamous cell carcinoma. Over half (58%) of gastric cancer was well and moderately differentiated, with the remaining 42% being poorly differentiated. The diagnostic method for gastric cancer was 40% abdominal CT scan, 30% upper GI endoscopic biopsy, and 30% post laparotomy. Three-quarters of the cases were stage III and IV at the time of diagnosis. Almost 67% of stage I and II patients were treated with gastrectomy, whereas 75% of stage III and IV cases were treated with chemotherapy alone using the FOLFOXm (5FU, leucovorin and oxaliplatin) or TP (cisplatin and paclitaxel) chemotherapy regimen (Table1).

The majority of esophageal cancers (84%) were squamous cell carcinomas. Nearly half (45%) of the cases were found in the lower part of the esophagus, 37% in the middle, and 18% in the upper region of the esophagus. The majority (78%) were diagnosed by chest CT scan and 22% by upper GI endoscopy. Stages III and IV accounted for 75% of the total, while Stages I and II accounted for 25%. All cases with stages I&II were referred to Tikur Anbessa Specialized Hospital (TASH) in Addis Ababa for thoracic surgeon evaluation and management. Stage III patients were also referred to TASH for neoadjuvant chemoradiotherapy, while stage IV patients received just chemotherapy, FOLFOX (5FU, leucovorin and oxaliplatin) or TP (cisplatin and paclitaxel) (Table2).

On the other hand, more than half of colorectal cancers were poorly differentiated (55%) and 45% were well and moderately differentiated respectively. The majority (63%) of the cases were diagnosed using an Abdomino-pelvic CT scan, 21% using colonoscopy biopsy and 16% using laparotomy. At the time of diagnosis, 68% of the cases were in stages III & IV, while 32% were in stages I & II. Surgery (colectomy) was performed for patients with stages I & II. For stage III, 21% of patients were given

neoadjuvant chemotherapy before surgery, while 79% were given surgery first and then adjuvant chemotherapy. Chemotherapy, FOLFOX (5FU, leucovorin and oxaliplatin) alone was used to treat stage IV (Table 3).

Trend of GIT cancers over seven years

Between 2013 and 2019, the number of cases of GIT cancer increased progressively. Esophageal (10-55), gastric (12-69), and colorectal cancers (11-59) have all increased in recent years, more than five-fold in comparison to 2013 (Figure 4).

Table 1: Characteristics, stage and histology of gastric cancer among cancer patients at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013-2019

Variable		Frequency (n=257)	Percent
Means of diagnosis	Abdominal CT scan	103	40.0
	Upper GI endoscopy	77	30.0
	Post laparotomy	77	30.0
Histologic types endoscopy biopsy	Adenocarcinoma	73	95.0
	Squamous cell carcinoma	4	5.0
Clinical Stage	Stage I	8	3.0
	Stage II	49	19.0
	Stage III	151	58.8
	Stage IV	46	18.0
	Not stated	3	1.2
Tumor behavior	Well-differentiated	44	57.0
	Moderately-Differentiated	10	13.0
	Poorly-differentiated	22	29.0
	Not stated	1	1.0
Treatment modalities.	Stage I& II: Gastrectomy	57	22.2
	Stage III: Neoadjuvant chemotherapy and surgery	153	59.5
	Stage IV: Chemotherapy alone	47	18.3

Table 2: Characteristics, stage and histology of esophageal cancer among cancer patients at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013-2019

Variable		Frequency (n=245)	Percent
Site of lesion	Upper	44	18.0
	Middle	91	37.0
	Lower	110	45.0
Means of diagnosis	Chest CT scan	191	78.0
	Upper GI endoscopy	54	22.0
Histologic types from endoscopy biopsy	Squamous cell carcinoma	45	84.0
	Adeno carcinoma	9	16.0
Clinical Stage	Stage I	12	4.9
	Stage II	50	20.4
	Stage III	147	60.0
	Stage IV	34	13.9
	Not stated	2	0.8
Tumor behavior	Well-differentiated	31	57.4
	Moderately-differentiated	7	13.0
	Poorly-differentiated	16	29.6
Treatment modalities	Stage I & II: Referred to TASH for thoracic surgery	72	25.3
	Stage III: Referred to TASH for neoadjuvant chemoradiotherapy	147	60.0
	Stage IV: Chemotherapy alone	36	14.7

TASH: Tikur Anbessa Specialized Hospital

Table3: Characteristics, stage and histology of colorectal cancer among cancer patients at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013-2019.

Variable		Frequency (n=204)	Percent
Means of diagnosis	Abdominopelvic CT scan	129	63.0
	Colonoscopy biopsy	43	21.0
	laparotomy	32	16.0
Clinical Stage	Stage I	14	6.8
	Stage II	49	24.0
	Stage III	116	56.9
	Stage IV	22	10.8
	Not stated	3	1.5
Tumor behavior of colonoscopy biopsy	Well-differentiated	7	16.3
	Moderately-Differentiated	12	27.9
	Poorly-differentiated	24	55.8
Treatment modalities.	Stage I and II: Colectomy	63	30.8
	Stage III: Colectomy and perioperative Chemotherapy	116	56.9
	Stage IV: Chemotherapy alone	25	12.3

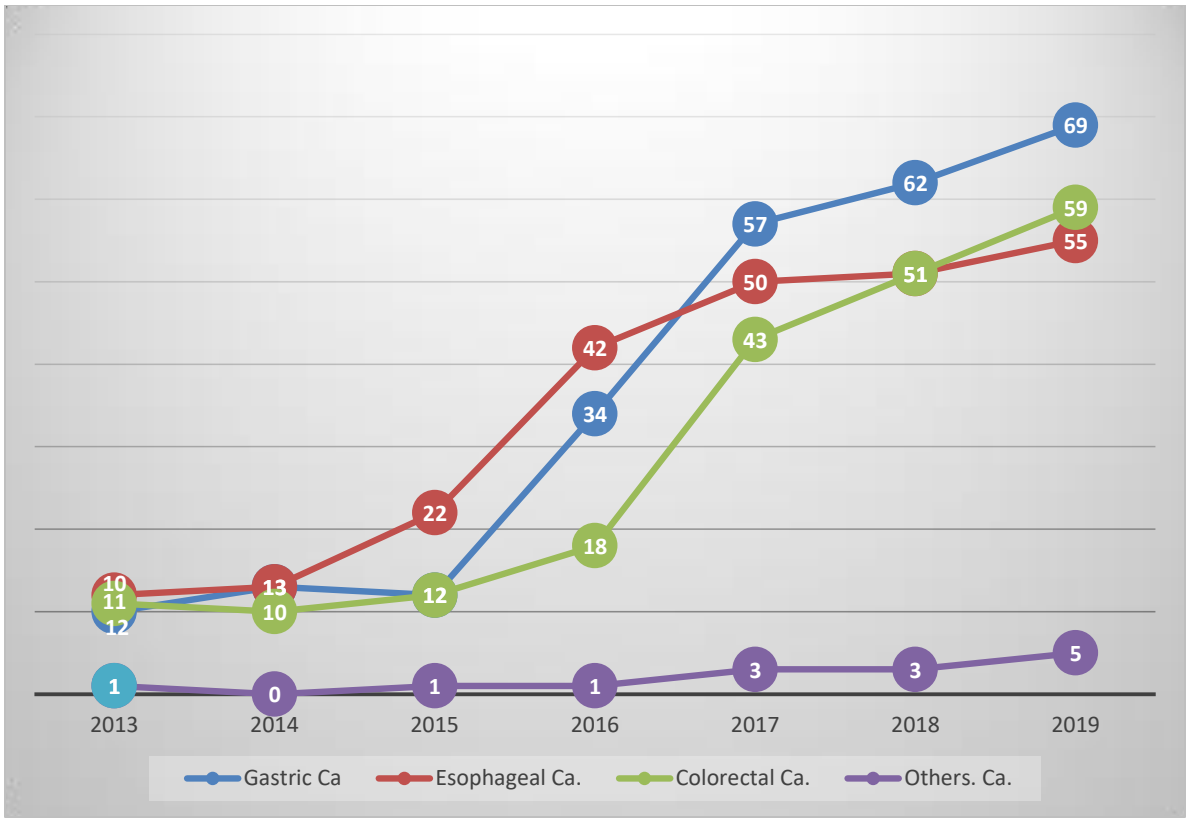


Figure 4: Trends of major gastrointestinal tract cancers at Hawassa University Comprehensive Specialized Hospital (HUCSH) from 2013-2019

Discussion

This present study analyzed data from records of 3,022 new cancer cases with complete records. Among the 720 (24%) patients diagnosed with GIT cancers, the overall burden of GIT cancers was found to be higher in males than in females. However, esophageal and anal cancers were more common in women than in men. This information is backed by the findings of a cancer study conducted in Sub-Saharan Africa, which showed a high incidence rate of gastrointestinal malignancies with a male: female ratio of 1:0.80 (4). On the other hand, a study on the epidemiology of colorectal cancer contradicts the conclusion with supporting data that demonstrates in the majority of nations, women did not have a chance of or need for colorectal cancer testing (19).

The majority (52.6%) of the GIT cancer cases came from Oromia region, followed by SNNPR (46.7%). Besides, esophageal and gastric cancers were high in patients from Oromia region and colorectal cancer was more common in patients from the SNNPR. This might be that as a result of the lack of nearby treatment centers, more cases are coming from the Oromia region. Besides, it needs further investigation to get the actual reasons.

At the age of four and five decades, esophageal and gastric cancers were highly common. Colorectal cancer was common in the third and fourth decades of life. Similarly, a recent study that looked at patterns by age discovered that stomach cancer rates increased in women under the age of 40 years (14, 20). In contrast, a study conducted in a few African countries found that the incidence of stomach cancer does not increase over time (21). The difference could be

that there may be a set of risk factors for GIT cancer among younger adults that haven't yet been detected by researchers.

From 2013 to 2019, the number of cases of GIT cancer increased substantially. The incidence of esophageal, gastric, and colorectal cancers has been continuously climbing over the years. This conclusion is consistent with the findings of the studies conducted in Asia (5, 21). In a study conducted in Africa, the incidence of gastrointestinal tract cancers was found to be progressively increasing year after year. In the majority of cancer types, the number of cases increased more than five-fold over a seven-year period (12). The increase could be attributable to advancements in diagnostic technology, clinicians better understanding and testing skills, or a variety of other unknown factors (12, 22, 23).

As a limitation, we were unable to pinpoint the root causes and why GIT cancers are escalating due to the nature of the investigation. Furthermore, assessing the patients' treatment outcomes was difficult.

Conclusion

Trends of gastrointestinal cancer have generally been rising over time. It is believed that lifestyle change instruction will slow the spread of gastrointestinal malignancies. Establishing a routine registration center is essential for measuring the true burden and giving prevention more focus. Further longitudinal study might be necessary to investigate more about the risk factors.

Acknowledgement

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Ethical considerations

Approval of this study was granted by the Research and the Ethics committee of the School of Public Health and the Institutional Review Board of the College of Medical and Health Sciences at Hawassa University (reference number: IRB/027/11). Permission to undertake this study was also obtained from HUCSH administrative director and an official letter was sent to the medical record department from the chief clinical service officer of the hospital. All data has been derived from secondary sources, such as medical records, with no direct interaction with patients. To protect the privacy and confidentiality of sensitive information, each patient's name was replaced with a code.

Data Availability statement

The datasets generated and/or analyzed during the current 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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