

**PREVALENCE AND PATTERNS OF HEAD & NECK CANCERS IN
PATIENTS VISITING SPHMMC, ETHIOPIA FROM 2017-2018**

**Research paper to be submitted to SPHMMC as a partial
fulfillment of specialty certificate in Otolaryngology-Head & Neck
Surgery**

**By Yohannes Shiferaw (MD, Otolaryngology-Head & Neck
Surgery Resident)**

Addis Ababa, Ethiopia

July, 2019

PREVALENCE AND PATTERNS OF HEAD & NECK CANCERS IN
PATIENTS VISITING SPHMMC, ETHIOPIA FROM 2017-2018

Research paper to be submitted to SPHMMC as a partial fulfillment of
specialty certificate in Otolaryngology-Head & Neck Surgery

By Yohannes Shiferaw (MD, Otolaryngology-Head & Neck Surgery
Resident)

Advisors

1. Mr Tewodros Fantahun (Lecturer, Public health advisor)
2. Dr Samson Dires (Ass. Prof, Clinical advisor)

Addis Ababa, Ethiopia

July, 2019

ABSTRACT

Background: Head and Neck cancer comprises a diverse array of diseases with distinct anatomical subsites, histopathologic features and risk factors. The most common type of head and neck cancer is squamous cell carcinoma (SCC) of the mucosa of the upper aerodigestive tract (UADT). In 2008, more than 600 000 people worldwide were diagnosed with UADT SCC. The incidence of and risk factors for UADT SCC differ by tumour subsite. These major subsites are nasopharynx, oral cavity, oropharynx, larynx, hypopharynx, salivary glands, and thyroid.

Despite this growing burden, cancer continues to receive low public health priority in Africa, largely because of limited resources and other pressing public health problems, including communicable diseases such as Acquired Immune Deficiency Syndrome (AIDS)/Human Immunodeficiency Virus (HIV) infection, malaria, and tuberculosis.

It may also be in part due to a lack of awareness about the magnitude of the current and future cancer burden among policy makers, the general public, and international private or public health agencies

Objective: To assess the prevalence and patterns of Head and Neck cancers in patients visiting SPHMMC from 2107-2018.

Methods and participants: Health facility based retrospective chart review study was conducted. This is a two year retrospective study to analyze the data recorded in SPHMMC ENT Department from Jan 1, 2017 up to Dec 31, 2018. The data from the registration book was checked, selected and those included in the inclusion criteria's were fed to SPSS version 23.0 to analyze the type, the pattern, and other variables.

Results and Discussion: A total of 100 patients were diagnosed with head and neck cancer among which 62 (62.00%) were males. Laryngeal(35.00%) and salivary gland cancers (26.00%) were the leading head and neck cancers. Squamous cell carcinoma is the predominant histologic type (70.00%). Most patients (73.00%) presented at advanced stages of cancer.

Conclusion: Cancer has been increasingly recognized as a critical public health problem in Ethiopia, Despite this increasing burden, cancer continues to receive low public health priority in Africa, largely because of the overwhelming burden of communicable diseases and limited resources. This study has summarized the patterns of head and neck cancers in SPHMMC, Ethiopia. This should be helpful to raise cancer awareness and promote cancer prevention and control in this country

Key words: Prevalence, Pattern, Head and Neck Surgery (HNS), SCC, SPHMMC

AKNOWLEDGEMENT

I would like to express my sincerely thanks to St Paul's Hospital Millennium Medical College for giving me this chance to undertake this research.

My deepest gratitude and appreciation goes to my advisors, Mr Tewodros Fantahun (Lecturer, Public health advisor) and Dr Samson Dires (Ass. Prof, Clinical advisor) for their invaluable and unreserved guidance and constructive comments, suggestion and help throughout the development of this research paper.

Finally I would like to express my gratitude to all those who directly or indirectly extended their helping hands in the preparation of this research paper.

Table of contents

Contents	Page
ABSTRACT.....	I
AKNOWLEDGEMENTS.....	II
TABLE OF CONTENTS.....	III
ABBREVIATIONS AND ACRONYMS.....	V
1. INTRODUCTION.....	1
1.1 Background	1
1.2 Statement of the problem.....	2
2. LITERATURE REVIEW.....	3
3. SIGNIFICANCE OF THE STUDY.....	7
4. OBJECTIVES.....	8
4.1 Genera objective.....	8
4.2 Specific objectives.....	8
5. METHODS.....	9
5.1 Study area and period.....	9
5.2 Study design.....	9
5.3 Population.....	9
5.3.1 Source population.....	9
5.3.2 Study population.....	9
5.3.3 Inclusion and exclusion criteria.....	9
5.4 Measurement variables.....	10
5.4.1 Data collection instrument.....	10
5.4.2 variables.....	10
5.4.2.1 Independent variables.....	10

5.4.2.2 Dependent variable.....	11
5.5 Data collection procedures.....	11
5.6 Operational definitions.....	11
5.7 Data processing , analysis, interpretation and presentation.....	11
5.8 Data quality management.....	11
5.9 Ethical consideration.....	12
5.10 Dissemination and utilization of results.....	12
6. RESULTS.....	13
7. DISCUSSION.....	21
8.CONCLUSION.....	24
9. RECOMMENDATION.....	24
10.STRENGTH AND LIMITATIONS.....	24
11.REFERENCES.....	25
12.ANNEXES.....	29
12.1 Questionnaire.....	29

ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AJCC	American Joint Committee of Cancer
CRT	Chemoradiotherapy
DNA	Deoxyribonucleic Acid
EBV	Epstein–Barr virus
FNA	Fine Needle Aspiration
ENT	Ear, Nose, & Throat
HBV	Hepatitis B Virus
HHS	Human Herpes Virus
HIV	Human Immunodeficiency Virus
HNS	Head and Neck Surgery
HNSCC	Head and Neck Squamous Cell Carcinoma
HPV	Human Papilloma Virus
IRB	Institutional Review Board
OPSCC	Oropharyngeal Squamous Cell Carcinoma
RT	Radithery
RCR	Retrospective Chart Review
SEER	Surveillance, Epidemiology and End Results
SPHMMC	St Paul's Hospital Millennium Medical College
SPSS	Statistical Package for Social Sciences
UADT	Upper Aerodigestive Tract
UICC	Union International against Cancer Committee
USA	United States of America
WHO	World Health Organization

1. INTRODUCTION

1.1 Background

Head and neck cancer comprises a diverse array of diseases with distinct anatomical subsites, histopathologic features and risk factors. The most common type of head and neck cancer is squamous cell carcinoma (SCC) of the mucosa of the upper aerodigestive tract (UADT). In 2008, more than 600 000 people worldwide were diagnosed with UADT SCC [1]. The incidence of and risk factors for UADT SCC differ by tumour subsite. These major subsites are nasopharynx, oral cavity, oropharynx, larynx, and hypopharynx. The sites of lip, oral cavity, oropharynx, nasopharynx, and larynx, collectively, comprised the sixth most common cancer in sub-Saharan Africa, with 18,099 reported cases in 2008 [2].

Increases in the prevalence of tobacco consumption and immune-suppression induced by the human immunodeficiency virus (HIV), coupled with such existing risk factors for cancer as alcohol, the high prevalence of cancer-associated infectious agents like human papillomavirus (HPV), hepatitis B viruses (HBV), and human herpesvirus-8 (HHV8); and environmental exposure to toxins, such as aflatoxins, will have an important impact on future cancer patterns and incidence [3].

Nasopharyngeal cancers are typically related to Epstein–Barr virus, and are a major contributor to the UADT burden in Southern China and Southeast Asia [4]. However, SCCs at this site are relatively rare in other populations. The majority of UADT SCCs worldwide were caused by tobacco and alcohol, and in many countries, public health efforts aimed at reducing tobacco exposure have helped decrease the incidence of UADT SCC [5]. However, in North America, Europe and Australia, there is an epidemic of oropharyngeal SCC (OPSCC) caused by infection with human papillomavirus (HPV), and HPV-positive OPSCC is now more common than tobacco-and-alcohol-associated OPSCC in many of these countries [6].

In contrast, in developing countries where the prevalence of smoking is increasing, the incidence of UADT SCC is also increasing [7]. The rate of oral cavity SCC is higher in South Asian countries than other countries, most likely because of use of oral tobacco and related products, resulting in a global health disparity [8].

Upper aerodigestive tract cancers are staged according to the American Joint Commission on Cancer (AJCC) staging manual, by site and sub-site, based on the complex anatomy and physiology of the head and neck region. The aerodigestive anatomic sites delineated by AJCC are sinonasal, nasopharynx, oropharynx, oral cavity, hypopharynx, and larynx. Across all head and neck sites, the most common histology is squamous cell carcinoma (SCC). Head and neck anatomy, as it pertains to staging cancers, requires specific training. There are only a limited number of head and neck surgeons in sub-Saharan Africa [9].

1.2 Statement of the Problem

Despite this growing burden, cancer continues to receive low public health priority in Africa, largely because of limited resources and other pressing public health problems, including communicable diseases such as Acquired Immune Deficiency Syndrome (AIDS)/Human Immunodeficiency Virus (HIV) infection, malaria, and tuberculosis. It may also be in part due to a lack of awareness about the magnitude of the current and future cancer burden among policy makers, the general public, and international private or public health agencies.

Epidemic of cancer has transited beyond the geographical boundaries of countries. The globe is under the clutch of this dreadful disease which is spreading rapidly. Similar to the differences between Africa and the developed world, cancer incidence and mortality patterns vary remarkably across regions within Africa because of the substantial regional differences in economic development and social, cultural, and other environmental factors, including major known risk factors [10].

Some cancers are more common in people in the developed world others occur more frequently in people who live in developing countries. Others certain types of cancers are common in both already developed countries and undergoing economic development. These regional differences might be explained by genetic differences among populations, variations in lifestyles, environmental exposures and other risk factors [11,12].

In the absence of cancer planning and control interventions, around 70% of the global cancer burden will arise in the developing world. The non-communicable diseases, such as cancers, are emerging health problems that need to be dealt appropriately to sustain public health advances that have already been achieved [13].

Even despite declining overall life expectancy as a result of the HIV epidemic, Africans will continue to age, which will contribute to cancer's becoming an increased burden on health services, both in relative and absolute terms. Data on cancer patterns in Africa are sparse, but the considerable effort which has gone into fostering the development of population based cancer registration in the continent is now bearing fruit [14].

In Ethiopia where oncology practice is so young, awareness even among medical professionals about oncology is much inferior than expected. In Ethiopia like most of sub-Saharan Africa countries doesn't have cancer registry. The Ethiopian oncology service in organized way was started in Tikur Anbessa Specialized Hospital since 1998 Ethiopian calendar [15].

2. LITERATURE REVIEW

Cancer is predicted to be an increasingly important cause of morbidity and mortality in all regions of the world. The forecasted changes in population demographics in the next two decades mean that even if current global cancer rates remain unchanged, the estimated incidence of 12.7 million new cancer cases in 2008 will rise to 21.4 million by 2030, with nearly two thirds of all cancer diagnoses occurring in low and middle income countries. Overall, there were 14.1 million new cases and 8.2 million deaths in 2012 [16].

Cancer is the leading cause of death in developed countries and the second leading cause of death in developing countries. With over 7 million new cases- often detected at a later stage- and 4.8 million deaths, the developing world is bearing over half of this burden but is the least equipped to cope with this situation[17].

According to the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) programmes of the United States, between 1975 and 2010 the incidence for most head and neck cancers sites has globally decreased except for tongue, tonsil, salivary glands and thyroid [18].

Due to the increase in the global population and as an effect of ageing, it is predicted that by 2030 the number of new cancer cases will increase to more than 21million, and deaths to 13 million. This assumption is reinforced by migration patterns that show incidence of cancer among migrants' changes to more closely & reflect the rates in the adoptive country. This has been observed with the incidence of colon cancer in Japanese people emigrating to Hawaii and San Francisco [19].

Additionally, the incidence of prostate and breast cancers are low among Chinese people in Asia, but increases have been observed when these people move to the United States of America. Several migrant studies have documented that cancer rates in successive generations of migrants shift in the direction of the prevailing rates in the host country, suggesting that the international variations in cancer rates for most cancers largely reflect differences in environmental risk factors (including lifestyle and culture) rather than genetic differences [20].

Sub-Saharan Africa is experiencing a rapidly increasing burden of cancer-related morbidity and mortality. While annual deaths in the region resulting from human immunodeficiency virus (HIV) [21], tuberculosis[22], and malaria[23] are steadily declining, cancer deaths are projected to increase by 85% between 2008 and 2030 [24].. Moreover, these projections assume static age-specific incidence rates and are based solely on projected population growth and aging. Population-based cancer registries, however, demonstrate increasing cancer incidence, likely resulting from HIV and westernization of lifestyles [25].

In sub-Saharan Africa, the oropharyngeal/oral cavity was found to be the most common site, with 7750 cases (90% of all cases). Few papers distinguished oropharyngeal from oral cavity, making identification of possible HPV-associated oropharyngeal squamous cell carcinoma (SCC) difficult [26].

SCC of the nasopharynx, nasal cavity, or paranasal sinuses was identified in 410 patients (4.8% of all cases). Laryngeal SCC was found in 385 patients (4.5% of all cases), and only 66 patients (0.8% of all cases) with hypopharyngeal SCC were identified [26].

In 862 patients with data available, 43% used tobacco and 42% used alcohol, and reported use varied widely and was more common in laryngeal SCC than that of the oropharyngeal/oral cavity. Toombak and kola nut use was reported to be higher in patients with HNSCC. Several papers reported HIV-positive patients with HNSCC, but it was not possible to determine HNSCC prevalence in HIV-positive compared to negative patients. Reports of treatment and outcomes were rare [26].

The roles of risk factors in HNSCC incidence in sub-Saharan Africa were difficult to delineate from the available studies, but a majority of patients did not use tobacco and alcohol [26].

This suggests future cancer burden in the region may be significantly underestimated. Earlier cancer detection via screening, insights into tumor biology and pathogenesis, as well as improved treatments and supportive care, have contributed to increasing cancer survivorship in high-income countries. However, cancer patients in sub-Saharan Africa have largely not benefited from these advances and outcomes remain poor because of severely limited resources for diagnosis and treatment, as well as possible differences in the etiology and pathogenesis of cancer in this region [27].

In general, smoking, dietary patterns, and reproductive behaviors have been known to be the major risk factors for cancer in western countries, and infectious agents said to be the commonest risk factor in economically developing countries. However, currently one can see these patterns are changing rapidly. While smoking prevalence is declining in economically developed countries, it is increasing in some developing countries in South America, Asia, and Africa [28].

Cancers that once were rare and considered the diseases of western countries, such as colon, breast, and lung cancers, are now frequently diagnosed in less developed or economically transitioning countries and their rates are on the rise [29]. In addition to the increasing trends, the future burden of cancer in the developing world is likely to be exasperated by the expected increases in life expectancy and aging and growth of the population [30].

The annual incidence of head and neck cancers worldwide is more than 550,000 cases with around 300,000 deaths each year [31]. Male to female ratio ranges from 2:1 to 4:1. About 90% of all head and neck cancers are squamous cell carcinomas (HNSCC). HNSCC is the sixth leading cancer by incidence worldwide. Most HNSCCs arise in the epithelial lining of the oral cavity, oropharynx, larynx and hypopharynx [32].

The five-year overall survival rate of patients with HNSCC is about 40-50%. About one third of patients present with early stage disease (T1-2, N0). Treatment for early HNSCC usually involves single-modality therapy with either surgery or radiation. Survival is comparable for the two approaches [33].

Early stage cancers have a very favorable prognosis with high cure rates with surgery or radiation alone and chemotherapy or concurrent chemotherapy/radiation is not indicated. For patients with pathologically staged III, IVa/b head and neck cancer, postoperative concomitant chemo-radiation with cisplatin has shown improvement in local-regional control and survival rates for those with positive microscopic surgical margins and/or extra-capsular nodal extension [34].

Each of these cancers is the result of a multistep accumulation of genetic mutations in a progenitor cancer cell. Subsequent proliferation of mutated progenitor cells results in clonal expansion. With further accumulation of mutations, the clonal outgrowth becomes unregulated and irreversible. The nascent tumor progressively acquires new phenotypes including the capacity for invasiveness and metastasis. It was previously thought that head and neck cancers resulted from 6 to 10 independent significant genetic mutations acquired over a period of 20 years. However, recent data from head and neck cancer genome sequencing suggest that many more mutations accumulate, although most of these may be of little consequence. In HNSCC, on average, 1 to 15 base pairs are mutated for each megabase of exome, which suggests there may be at least 6,000 to 90,000 mutations for the 6.4 billion base pairs in the human diploid genome [35].

Exposure to carcinogens present in tobacco or betel quid is a major factor for head and neck cancer that has been recognized for years. Tobacco derivatives contain a potent carcinogen, which damage the DNA and mutate the genome of progenitor cancer cell; tobacco smoke contains more than 4,000 toxic compounds including 81 carcinogens, and smokeless tobacco contains mutagenic nitrosamines. Interestingly, in vitro, one of the most potent carcinogens found in cigarette smoke, named benzo[a]pyrene diol epoxide, preferentially mutates p53 at hot spots found in lung cancer. It is therefore perhaps not surprising that p53 is the most frequently mutated gene in HNSCC, since tobacco consumption and synergistically excessive alcohol intake are the two major risk factors for HNSCC in the USA; "heavy" tobacco consumption increases the cancer risk by 5.8 times, .. "heavy" drinking by 7.4 times, and combination of the 2 increases the risk by 38 times in male and 100 times in females [36,37,38].

In eastern countries, areca nut chewing in betel quid has been identified as a risk factor for HNSCC. The areca nut does not contain a single organic chemical responsible for the cancer formation, but rather a combination of chemicals that affect distinct steps of carcinogenesis. Areca alkaloids have genotoxic effects and participate in tumor initiation, and arecaine contributes to tumor promotion [39].

After HPV was identified in oropharyngeal cancers, it became evident that a subset of oropharyngeal HNSCC is not associated with smoking and drinking but rather with promiscuous oral sex behavior and to seropositivity of sexually transmitted HPV16 [40].

HPV-positive HNSCC found in nonsmokers has a better prognosis than traditional HNSCC found in smoker/drinkers. That these tumors represent two groups of HNSCC with distinct tumor biology is also evident at a genetic level: considerably fewer mutations are found in HPV-positive tumors from nonsmoker patients [41].

While head and neck cancers form one of the most common cancers in South and Southeast Asian countries, they form only 1%–4% of all cancers in the Western world. Oral cancers are predominant forms of head and neck squamous cell cancer (HNSCC) in India, Pakistan, and other Southeast Asian countries; oropharyngeal and tongue cancers are common in the Western world. These differences in site of disease may be related to the prevalent habits in the respective regions [42,43,44].

3. SIGNIFICANCE OF THE STUDY

Data on prevalence and patterns of distribution of head and neck cancer is of great relevance for planning healthcare programs targeting improved cancer care. Information on mode of treatment afforded could help in tuning up the service delivery for head and neck cancer patient.

Despite this, according to the available data, there are very few studies that has assessed the prevalence and patterns of head and neck cancer in the country and no study in St Paul's hospital in particular. So the present is designed to assess the prevalence and pattern of head and neck cancer in SPHMMC based on Hospital registry and to analyze the prevalence and correlation of type of malignancy with age, sex, stage and type of cancer.

The present study will examine the prevalence of head and cancer in patients visiting SPHMMC. It will also determine the distribution of head and neck cancer by different age groups and sex.

Additionally the study will try to assess the commonly affected anatomic sites and subsites and common histological types. Lastly the study will check the stage of disease at presentation and mode of treatment given.

Therefore results from this study may serve to inform primary care strategy revisions aimed at more widespread achievement of targets which would ultimately abate the burden of illness in head and neck cancer patients at the Hospital

4. OBJECTIVES

4.1 General Objective

- ✓ To assess the prevalence and patterns of Head and Neck cancers in patients visiting SPHMMC from 2017-2018

4.2 Specific Objectives

- ✓ To assess the prevalence of Head and Neck cancers in SPHMMC from 2017-2018
- ✓ To assess the patterns of Head and Neck cancers in SPHMMC from 2017-2018
- ✓ To determine the factors associated with Head and Neck cancers in SPHMMC from 2017-2018

5. METHODS

5.1 Study Area and period

This study was conducted from March 01-30, 2019 at the department of ENT of SPHMMC, which is a teaching and referral hospital located in the capital of Ethiopia, Addis Ababa. The above mentioned department of the college give service to patients with head and neck cancers both on ambulatory and inpatient bases.

5.2 Study design

Health facility based retrospective chart review was used.

5.3 Population

5.3.1 Source population

The source population for this study were all patients who have visited and treated at ENT department of SPHMMC from January 01, 2017-December 31, 2018.

5.3.2 Study population

The study population were all patients who are diagnosed with Head and Neck cancer at the ENT department of SPHMMC from January 01, 2017- December 31, 2018.

This is a retrospective study to analyze the data recorded in SPHMMC ENT, Department from Jan 1, 2017 up to Dec 31, 2018. The data from the registration book was checked and selected those included in the inclusion criteria's were fed to SPSS to analyze the type, the pattern, and other variables

5.3.3 Inclusion and exclusion criteria

5.3.3.1 Inclusion criteria

All patients who had been diagnosed with Head and Neck cancer and registered with full information including age, sex, diagnosis, stage, and whose medical records have full information about pathologic findings in the registration book or in the chart were considered to be eligible for the study.

5.3.3.2 Exclusion criteria

Patients registered but with insufficient information about one of the following vital variables like pathologic diagnosis (FNA or Biopsy), stage (Imaging), or without adequate data either in the registration book or in the file were not eligible and excluded from analysis.

5.4 Measurement and variables

5.4.1 Data collection instrument

Data will be extracted from review of patient medical records. The structured questionnaire will be compiled adapting questions from different literatures and by considering the local situation.

5.4.2 Variables

5.4.2.1 Independent variables

Age	Substance abuse (Cigarette, alcohol & Khat)
Sex	Anatomic site
Occupation	Histopathologic type
Educational status	Stage of cancer

5.4.2.2 Dependent variable

- ✓ Head and Neck cancer

5.5 Data collection procedures

The data for this cross sectional study was collected through review of patients medical records who were diagnosed with different types of head and neck cancer and either treated at St Paul's hospital or referred to other facilities.

5.6 Operational definitions

Cancer - is the disease that results when cellular changes cause uncontrolled growth and division of cells and eventually destroys body tissue.

SCC- is type of cancer that result from squamous cells which lines skin and hollow organs in the body like respiratory and digestive tracts.

Radiotherapy- is a treatment where radiation is used to kill cancer cells

Chemotherapy- is type of a cancer treatment that uses one or more anticancer drugs with intent of curative, prolong life or reduce symptoms.

Patterns of Head and Neck cancer- Head and neck cancer comprises a diverse array of diseases with distinct anatomical subsites, histopathologic features and risk factors of which the diagnosis, treatment and survival depends on this patterns.

5.7 Data processing, analysis, interpretation and presentation

Data was analyzed by SPSS Version 23.0 and for categorical variables, frequencies and percentages was used. Association between variables was checked using Pearson's r test and P value of <0.05 for statistical significance.

5.8 Data quality management

To assure the quality of the data great emphasis was given in designing data collection instrument for its simplicity and understand ability. The data collection instrument format was developed in English for its accuracy and desired result

5.9 Ethical Consideration

Ethical clearance (permission letter) and approval of the study was obtained from IRB of SPHMMC before starting the actual data collection. In addition the department was approached and asked about the feasibility of the study.

Application of patients' records in this study will be entirely confidential and private information will be protected.

5.10 Dissemination and Utilization of Results

After data was analyzed, based on the findings obtained, conclusions and recommendations were made. Then the results of the study will be submitted to SPHMMC. The result will be presented during thesis defense, as a partial fulfillment of specialty certificate in Otolaryngology - Head and Neck Surgery. Finally attempts will be made to present the results on scientific conferences and to publish the results of the study on local journals.

6. RESULTS

A total of 113 patients were registered in main registration book, out of them 13 patients were excluded because of insufficient information and found difficult to be analyzed. The rest all 100 patients were analyzed. According to this particular study from analyzed 100 patients 62.0 % (62) are male and the rest 38.0% (38) are female According to this study majority (59.0%) are Orthodox Christianity followers and the rest are either Muslim (24.0%) or Protestant (17.0%) in their religion. Regarding their educational status most are either never attended formal education (37.0%) or only completed elementary school (41.0%, i.e grade 1-8) and only 6.0% attended College or University.

Table 1

Sociodemographic Characteristics, (N=100)

Characteristics		Frequency	Percent
Gender	Male	62	62.00
	Female	38	38.00
	Total	100	100.00
Educational Status	Illiterate	37	37.00
	Grade 1-8th	41	41.00
	Grade 9-10th	13	13.00
	Grade 11-12th	3	3.00
	College and above	6	6.00
	Total	100	100.00
Marital Status	Married	78	78.00
	Single	14	14.00
	Divorced	1	1.00
	Widowed	3	3.00
	Pediatric age	4	4.00
	Total	100	100.00
Occupation	Gov't Employee	7	7.00
	Merchant	13	13.00
	Farmer	31	31.00
	Pensioner	3	3.00
	House Wife	24	24.00
	Others	22	22.00
	Total	100	100.00

Majority of the Patients were married (78.0%) and 14.0% are single, only small number are widow (3.0%) or divorced (1.0%) and the rest are children (4.0%). Regarding their current occupation most are either farmers (31.0%) or housewives (24.0%). The rest are merchants (13.0%), government employee (7.0%) and pensioners (3.0%). The others category in this study is significant (22.0%) which includes who are working in private companies, students and children etc.

This study also has shown that most of our patients are above the age of 40 years (58.0%). There were also significant number of patients diagnosed in their third decade (21-30 years) about 20.0%. There were only six (6.0%) and two (2.0%) of patients diagnosed with head and neck malignancy in the second and first decades respectively.

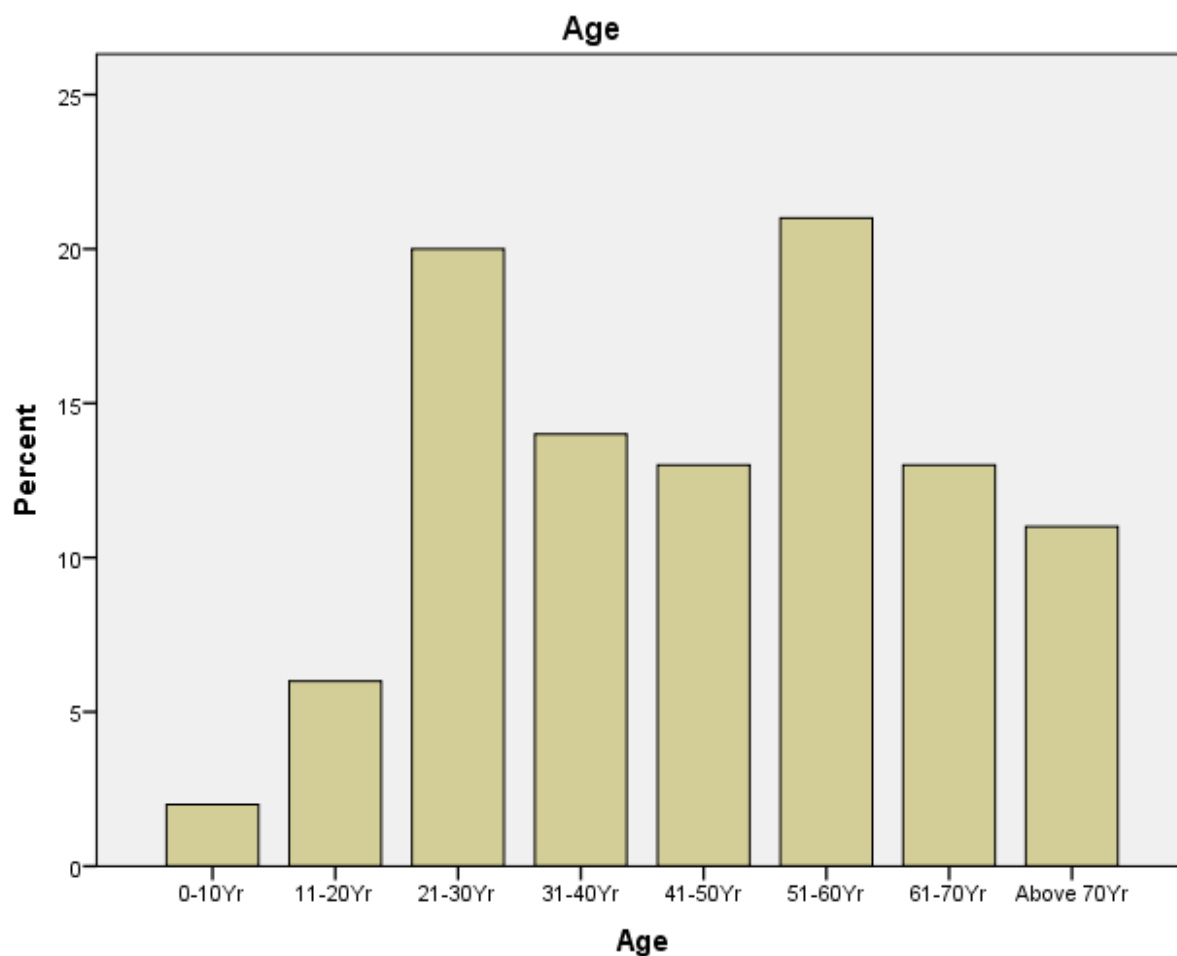


Figure 1. Age distribution of patients with head and neck malignancy

Table 2

Risk Factors Identified in Patients with Head and Neck Malignancy, (N=100)

Risk factor	Cigarette smoking		Alcohol drinking		Khat chewing	
	N	%	N	%	N	%
Yes	25	25	29	29	26	26
No	75	75	71	71	74	74
Total	100	100	100	100	100	100

The recent study tried to identify known and possible risk factors for head and neck malignancy. According to this study quarter of patients (25%) were cigarette smokers, twenty nine (29%) were alcohol drinkers but the amount, type of alcohol and duration of drinking were all lacking from the document. The study also tried to explore the possible relation of khat chewing and some head and neck malignancies, twenty six (26%) were khat chewers. History of khat chewing is not significantly associated with both oral cavity ($P=0.387$) and laryngeal cancer ($P=0.300$).

Table 3

Primary Sites of Head and Neck Cancers (N=100)

Primary Site	frequency	percentage
Larynx	35	35.00
Salivary Glands	26	26.00
Skin of Head and Neck	8	8.00
Thyroid Gland	7	7.00
Oral Cavity	6	6.00
Nose and Paranasal Sinuses	6	6.00
Nasopharynx	4	4.00
Hypopharynx	4	4.00
Oropharynx	3	3.00
Lip	1	1.00
Total	100	100.00

The primary objective of this study is to identify which anatomic sites of head and neck is primary site for malignancy and the study has found that the top five anatomical sites are laryngeal (35.0%), salivary glands (26.0%), skin of head and neck (8.0%), thyroid (7%), oral cavity (6%) and sinonasal (6%). The other sites are rarely the primary site for head and neck cancer as of the study, NPC (4%), hypopharynx (4%), oropharynx (3%), and lip (1%).see table 3.

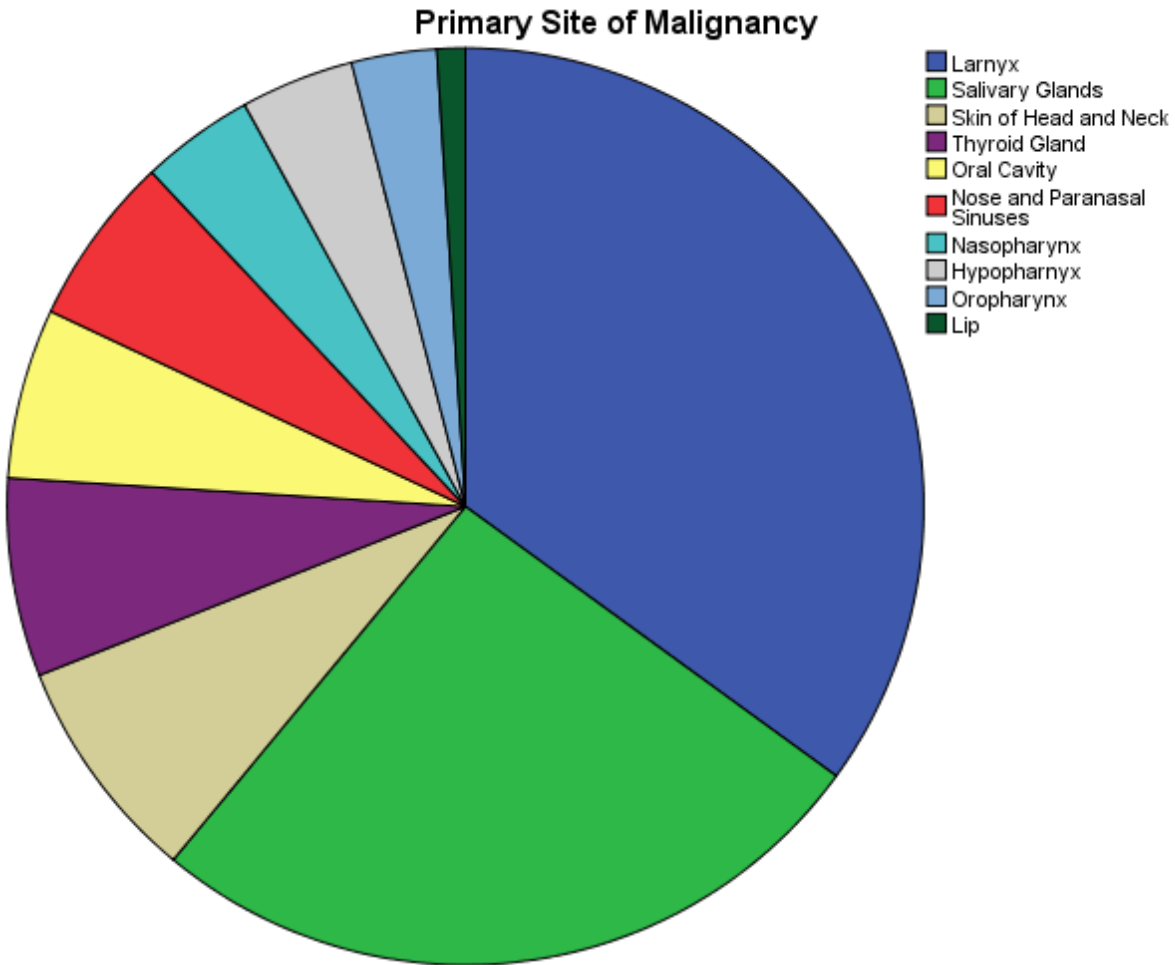


Figure 2. Anatomic site of primary malignancies of head and neck

Further analysis of subsite involvement was also done and glottic primaries are by far the commonest laryngeal subsite primaries (77.1%) and supraglottis the rest (22.9%). There is no subglottic primary laryngeal Ca in this study. Similarly salivary gland malignancies were also analyzed and parotid gland is the commonest (69.2%) followed by submandibular gland (26.9%) and minor salivary glands account for only 3.8% of primary salivary gland cancer. There is no sublingual primary malignancy in this study.

Table 4

Anatomic Subsite of Head and Neck Primary Cancers (N=100)

Primary Site	Subsite of Cancer	frequency	percentage
Oral Cavity	Lower gum	2	33.30
	Oral tongue	2	33.30
	Buccal mucosa	1	16.70
	Retromolar area	1	16.70
Oropharynx	Tonsil	3	100.00
Nasopharynx	Lateral wall (Fossa of Rosenmuller)	4	100.00
Hypopharynx	Postcricoid area	2	50.00
	Piriform Sinus	2	50.00
Larynx	Glottis	27	77.10
	Supraglottis	8	22.90
Sinonasal	Nasal Cavity	5	83.30
	Maxillary Sinus	1	16.70
Salivary Gland	Parotid	18	69.20
	Submandibular	7	26.90
	Minor Salivary Glands	1	3.80

Oral cavity cancers are shared between oral tongue (33.3%) and lower gum (33.3%) and the rest are from buccal mucosa (16.7%) and retromolar region (16.7%). Most sinonasal cancer are from nasal cavity (83.3%) and the rest from maxillary sinus (16.7%). All NPCs are from lateral wall and hypopharyngeal cancers shared equally in postcricoid (50%) and piriform sinus (50%).

The other objective of this study is to assess the histopathologic types of head and neck malignancies. Epithelial types are by far the most common histologic type of head and neck cancers (90%) and mesenchymal origin accounts for only 9% and very rare neuroectodermal (1%). Further analysis of each histologic groups was also done and found SCC is the commonest (61.4%) histologic type of head and neck malignancy. Among epithelial types next to SCC, mucoepidermoid carcinoma (13.6%) , adenoid cystic carcinoma (11.4%) and acinic cell carcinoma (5.7%). Others category in this sub analysis accounts about 13.6% of epithelial which includes all thyroid malignancies and some skin cancers.

Similarly mesenchymal types were analyzed and lymphoma (33.3%) and rhabdomyosarcoma (33.3%) are the commonest subtypes. There was only one case (11.1%) of osteosarcoma and from neuroectodermal one case of malignant melanoma found.

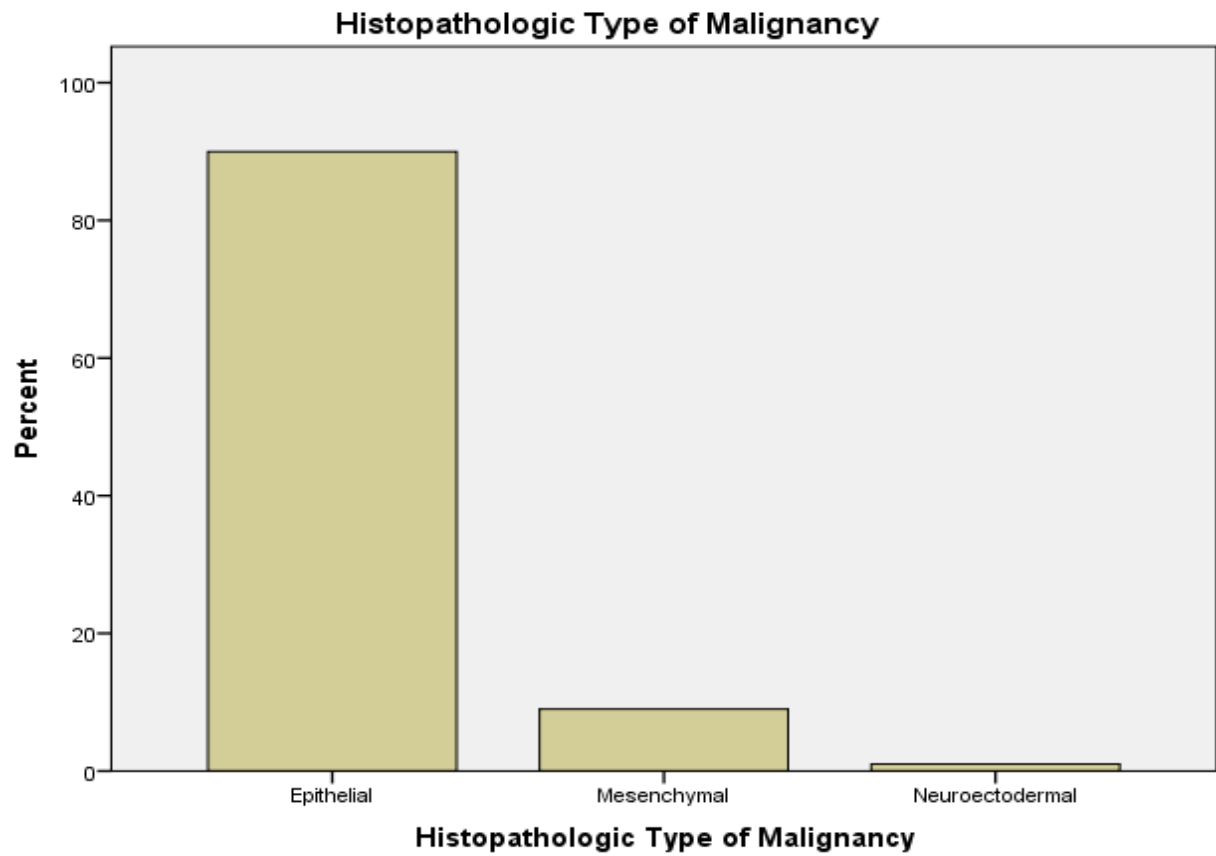


Figure 3. Histopathologic types of head and neck malignancy

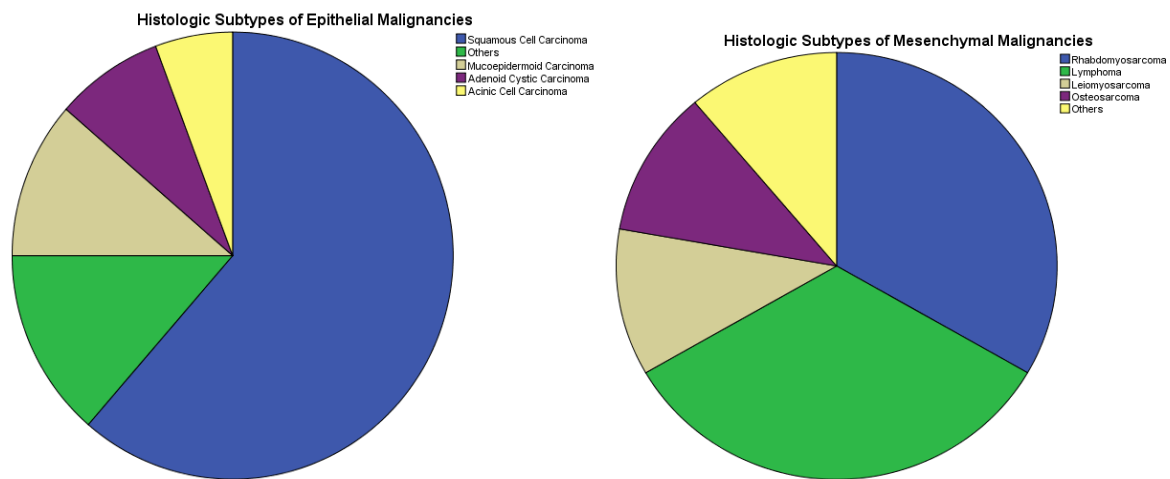


Figure 5. Subtypes of epithelial head and neck cancer Figure 6. Subtypes of mesenchymal head and neck cancer

Skin cancers arising in the head and neck are classified based on their histologic types and both BCC and SCC appeared equally occurring (37.5% each) and malignant melanoma accounts or 12.5%. Similar analysis of thyroid cancer was done and papillary Ca is leading type (71.4%) and followed by follicular type including Hurthle cell variant (28.6%). This particular study didn't find other histologic types like medullary and anaplastic.

Table 5

Distribution of Histologic Types for Thyroid and Head & Neck Skin Cancers (N=100)

Primary Site	Histologic Types	frequency	percentage
Thyroid	Papillary	5	71.4
	Follicular	2	28.6
Skin	Basal Cell Carcinoma	3	37.5
	Squamous Cell Carcinoma	3	37.5
	Melanoma	1	12.5
	Others	1	12.5

Final objective of this study is to determine the stage of cancer at presentation and its association with different anatomic sites. The study found majority (73%) of patients present at advanced stage of cancer either stage III (30%) or stage IV (43%). Only quarter (27%) of head and neck cancer patients presented at early stages (stage I or II). Further analysis of TNM sub stage was also assessed and similar to group stage patients present with either advanced T stage or cervical metastasis but distant metastasis was rare.

Table 6

Clinical Stage at Presentation of Head and Neck Cancer Patients (N=100)

T-Stage	frequency	percent	N-Stage	frequency	percent	M-Stage	frequency	percent
T1	12	12.00	N0	45	45.00	Mx	4	4.00
T2	23	23.00	N1	22	22.00	M0	95	95.00
T3	38	38.00	N2	31	31.00	M1	1	1.00
T4	27	27.00	N3	2	2.00			
Overall Group Stage			frequency	percent				
Stage I			14	14.00				
Stage II			13	13.00				
Stage III			30	30.00				

Stage IV	43	43.00
----------	----	-------

Table 7

Correlations Between Cigarette Smoking and Laryngeal Cancer by Gender (N=100)

Correlations		History of Cigarette Smoking	Subsite of Laryngeal Carcinoma	Gender
History of Cigarette Smoking	Pearson Correlation	1	0.121	.452**
	Sig. (2-tailed)		0.49	0
	N	100	35	100
Subsite of Laryngeal Carcinoma	Pearson Correlation	0.121	1	0.102
	Sig. (2-tailed)	0.49		0.56
	N	35	35	35
Gender	Pearson Correlation	.452**	0.102	1
	Sig. (2-tailed)	0	0.56	
	N	100	35	100

The study also tried to explore the association between different risk factors like cigarette smoking and head and neck cancers, specifically laryngeal cancer but it was not significant (P=0.49). Subgroup analysis by gender was also done and strong correlation at 2-tailed significance ($r=0.452$, $P<0.001$). Similarly history of khat chewing is not significantly associated with both oral cavity ($P=0.387$) and laryngeal cancer ($P=0.300$).

Table 8

Correlations Between Khat Chewing and Head and Neck Cancers (N=100)

Correlations		History of Khat Chewing	Subsite of Laryngeal Carcinoma	Tumor Site in the Oral Cavity
History of Khat Chewing	Pearson Correlation	1	0.18	0.436
	Sig. (2-tailed)		0.3	0.387
	N	100	35	6

7. DISCUSSION

Information on cancer patterns is an important basis for determining the priorities for cancer control in different countries worldwide. Although deaths and years of life lost from cancer have been used widely for this purpose, cancer pattern data provide important information on the risk of different cancers, independent of prognosis, which is important in the planning and evaluation of cancer prevention and early detection.

Worldwide, SCC of the oral cavity is the tenth most common cancer among men, and in 2008 263 000 people were diagnosed with this disease (171 000 men and 92 000 women) and it's the most commonest head and neck cancer. Unlike the above mentioned and other literatures the current study found laryngeal cancer being the commonest head and neck cancer both in males and females accounting for 35%. Laryngeal cancer is the second most common cancer in the head and neck worldwide. In 2008, 150 000 people worldwide were diagnosed with laryngeal SCC. The majority of patients with laryngeal SCC are men.

Despite being the commonest head and neck cancer worldwide oral cavity cancer accounts for only 6% of head and neck cancer in this study ranking 5th . Evidences also suggest most of head and neck SCCs are strongly associated with cigarette with and without smoke and alcohol consumption. Laryngeal SCC is strongly related to smoking and alcohol use; multiple studies confirm that the risk in smokers and drinkers is 4–177 times the risk in non-smokers/non-drinkers and that risk increases with duration and frequency of exposure. The current study also tried to explore this association but failed to show any significant association between both cigarette smoking and alcohol drinking with either laryngeal or oral cavity cancer.

There are mainly two reasons for this contradicting result from what is already known about causation of cigarette and alcohol for head and neck cancer. The first is very small sample size in this study which is the limitation and the second and most important is the culture of denying this behaviors during presentation to health professionals. Regarding the origin of SCC in the larynx most literatures points glottic origin for 60% , supraglottic for 35% and subglottic 5% of laryngeal cancer. The current study has similar pattern except for no cases with subglottic primaries, glottic (77%) and supraglottic (23%).

Salivary gland cancers are one of the rare head and neck cancers worldwide accounting for only 3-4% . In contrast to this the current study has found salivary gland cancers being the second most common head and neck cancers (26%). This may due to different etiologic factors such as genetics, occupational and other environmental factors which needs further study. Regarding the gland involvement it appears very similar with the rest of the world, parotid (69.2%), submandibular (26.9) and minor salivary glands the rest. Similarly histologic types of salivary

gland cancer, mucoepidermoid (38.4%), adenoid cystic (26.9%), acinic cell (19.2%) and the rest were different histologic types including carcinoma ex-pleomorphic adenoma and oncocytic carcinoma.

Cancer of the oropharynx is the third most common head and neck cancer after larynx and oral cavity worldwide and is also in a rapid rise in developed countries. This increase in tonsil and base of tongue cancer over the last decade is largely due to HPV infection of the palatine and lingual tonsils. Literatures show the traditional tobacco and alcohol related OPSSC is decreasing in developed countries while increasing in developing countries because of tobacco reduction projects in developed countries. In this study OPSSC accounts for only 3% and ranks 8th on the list. There is no data in our country which specifically addressed OPSSC in relation to HPV infection to compare whether it's on rise or not.

Nasopharyngeal carcinoma differs significantly from other UPADT SCCs with regard to its etiology, age at presentation and prognosis. Literatures point to some parts of the world has highest prevalence in NPC (south east Asia). In this study NPC accounts 4% of head and neck cancers and it is similar with global incidence except for the mentioned high prevalence areas.

Thyroid cancer is another head and neck cancer on a rise, the reason being either high detection rate of subcentimeter thyroid nodules by ultrasound or true increament of the cancer. Thyroid cancer is the 4th commonest head and neck cancer in this study accounting for 7%. Worldwide differentiated thyroid (papillary and follicular) cancers accounts for 80% of cases and medullary and anaplastic carcinomas accounts 5% each. In the current study all were differentiated (papillary 71.4%, follicular 28.6%).

Skin cancer is the most common human malignancy, with an estimated 3,500,000 nonmelanoma skin cancers cases in the United States annually. Skin cancers of head and neck region is the 3rd commonest head and neck cancer. Worldwide basal cell is the commonest accounting for 90% of skin cancers. Despite this the current study found equal prevalence of BCC and SCC each at 37.5% and malignant melanoma 12.5%.

The other rare types of head and neck cancers like sinonasal are found to be slightly higher in this study, accounting for only 6% and with great discrepancy with regard to subsite origin of primary sinonasal malignancies. Majority of the literatures sites maxillary sinus being the commonest site around (55%) and nasal cavity (35%), but in this study it is the reverse nasal cavity (83.3%) and maxillary sinus (16.7%). Other subsites were not found in this study. Similarly hypopharyngeal cancers were rare in this study accounting for 4% only, and post cricoid and piriform sinus sharing equally (50% each) with no cases of posterior pharyngeal wall origin. Lip cancer was extremely rare in this study with only one case (1%) of lower lip SCC.

Malignant disease of the head and neck is the sixth most common form of cancer worldwide with around 300 000 new cases per annum. Squamous cell carcinoma is by far the most common histologic type in the head and neck (90%). Even though epithelial histology accounts 90%,

only 61% were squamous type suggesting non-squamous epithelial types such as thyroid and salivary gland types contribute significantly and needs further detailed analysis.

Both malignant mesenchymal and neuroectodermal tumors rare in the head and neck region and accounts for only 10%. The only neuroectodermal malignant found in this study is malignant melanoma. Rhabdomyosarcoma is the commonest mesenchymal tumor in this study and it accounts for 33.3% all in under 20 years of age. Lymphoma is other mesenchymal malignant tumor detected in this study with similar incidence to rhabdomyosarcoma but no age predilection.

Majority (73%) of our patients presented at advanced stage of cancer either at stage III (30%) or stage IV (43%). Further TNM category of the cancer was also analyzed and T3 tumors were commonest (38%) and T4 (27%). Regional cervical lymph node metastasis were seen in slightly higher than of half (55%) of patients and distant metastasis was very rare only in 1% of patients and it was pulmonary metastasis.

Table 9

Correlations Between Regional Metastasis and Laryngeal Subsite Primaries (N=100)

		Correlations	
		Regional metastasis	Subsite of Laryngeal Carcinoma
Clinical N Stage of the tumour (Regional metastasis)	Pearson Correlation	1	-0.005
	Sig. (2-tailed)		0.977
	N	100	35
Subsite of Laryngeal Carcinoma	Pearson Correlation	-0.005	1
	Sig. (2-tailed)	0.977	

The above table shows that there is no significant association between the different laryngeal subsite primary cancer and cervical metastasis ($P= 0.977$). Most literatures found supraglottic cancers for its early regional neck metastasis due to its high lymphatic network and this contrasting result can be explained due to small sample size and this too needs further extensive research to really explore the association in our set up.

8. CONCLUSION

Cancer has been increasingly recognized as a critical public health problem in Ethiopia, Despite this increasing burden, cancer continues to receive low public health priority in Africa, largely because of the overwhelming burden of communicable diseases and limited resources. This study summarized the patterns of head and neck cancers in SPHMMC, Ethiopia. This should be helpful to raise cancer awareness and promote cancer prevention and control in this country.

9. RECOMMENDATION

I highly recommend establishing functional population-based cancer registries within the country to facilitate cancer control strategic plan and to improve insight to policymaker about pattern and type of cancer in general and head and neck cancer in particular.

10. STRENGTH AND LIMITATIONS

10.1 Strength

This study is first in its kind to assess the patterns of head and neck cancer in the country which particularly addressed head and neck cancers with the most recent classification scheme with anatomic sites and subsites, histologic types and recent staging manual (8th edition UICC and AJCC).

10.2 Limitations

- ✓ Very small sample size
- ✓ Retrospective design

11. REFERENCES

1. Ferlay J, Shin H, Bray F, et al. GLOBOCAN 2008 v2.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer; 2010. Available from: <http://globocan.iarc.fr>
2. John C Watkinson & Raymond W Clarke, Scott-Browns Otorhinolaryngology-Head & Neck Surgery, Boca Raton , Taylor & Francis Group, 2019, 8th ed., vol 3.
3. Jamison DT, Feachem RG. Disease and Mortality in Sub-Saharan Africa. Washington, USA: World Bank; 2006
4. Zheng X, Yan L, Nilsson B, et al. Epstein Barr virus infection, salted fish and nasopharyngeal carcinoma: a case-control study in southern China. *Acta Oncol* 1994; 33: 867–72
5. Centers for Disease Control and Prevention (CDC). Vital signs: current cigarette smoking among adults aged ≥ 18 years – United States, 2009. *MMWR Morb Mortal Wkly Rep* 2010; 59: 1135–40
6. Chaturvedi AK, Engels EA, Pfeiffer RM, et al. Human papillomavirus and rising oropharyngeal cancer incidence in the United States. *J Clin Oncol* 2011; 29: 4294–301.
7. McCormack VA, Boffetta P. Today's lifestyles, tomorrow's cancers: trends in lifestyle risk factors for cancer in low- and middle-income countries. *Ann Oncol* 2011; 22: 2349–57.
8. Hashibe M, Brennan P, Chuang SC, et al. Interaction between tobacco and alcohol use and the risk of head and neck cancer: pooled analysis in the International Head and Neck Cancer Epidemiology Consortium. *Cancer Epidemiol Biomarkers Prev* 2009; 18: 541–50.
9. Barnes L, Eveson JW, Reichart P, Sidransky D, editors. World Health Organization classification of tumours. Pathology and Genetics: Head and neck tumours. Lyon: IARC Press; 2005
10. Parkin DM, Whelan SL, Ferlay J, Teppo L, Thomas BD (2002) Cancer Incidence in five Continents VIII. IARC Scientific Publication No. 155, International Agency for Research on Cancer (IARC) Press, Lyon, France.
11. Dunn JE (1975) Cancer epidemiology in populations of the United States-with emphasis on Hawaii and California - and Japan. *Cancer Res* 35: 3240-3245

12. Yu H, Harris RE, Gao YT, Gao R, Wynder EL (1991) Comparative epidemiology of cancers of the colon, rectum, prostate and breast in Shanghai, China versus the United States. *Int J Epidemiol* 20: 76-81.
13. Ferlay J, Shin HR. Globocan 2008 v1.2: Cancer Incidence and Mortality Worldwide. France: IARC; 2008.
14. Fadlelmola FM. Cancer registries and cancer genomics research in east Africa: challenges and lessons learned. *Int Clin Pathol J*.2016;2(4):67–76
15. Tigeneh W (2015) Pattern of Cancer in Tikur Anbessa Specialized Hospital Oncology Center in Ethiopia from 1998 to 2010. *Int J Cancer Res Mol Mech* Volume 1.1
16. Jacques Ferlay, Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN 2012
17. *WHO The Global Burden of Disease: 2004 update Geneva: WHO 2008*
18. Howlader NNA, Krapcho M, Neyman N, et al. (eds). SEER Cancer Statistics Review, 1975–2008. Bethesda, MD: National Cancer Institute. Available from: http://seer.cancer.gov/csr/1975_2008/ (based on November 2010 SEER data submission)
19. Schottenfeld D, Fraumeni JF Jr, Kolonel L, Wilkens L (2006) Migrant studies. In: Schottenfeld D, Fraumeni JF Jr (eds) *Cancer epidemiology and prevention*. 3rd edition, Oxford University Press, Oxford 189-201.
20. Buell P, Dunn JE Jr (1965) Cancer mortality among Japanese Issei and Nisei of California. *Cancer* 18: 656-66420.
21. UNAIDS world AIDS day report 2012 fact sheet: Sub-Saharan Africa [Internet]. Geneva: Joint United Nations Program on HIV/AIDS (UNAIDS); 2012; Available from: http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2012/gr2012/2012_FS_regional_ssa_en.pdf
22. Global tuberculosis report 2012 [Internet]. Geneva: World Health Organization; 2012; cited March 6, 2013]. Available from: http://www.who.int/tb/publications/global_report/en/index.html.
23. World malaria report 2012 [Internet]. Geneva: World Health Organization; 2012; cited March, 6 2013]. Available from: http://www.who.int/malaria/publications/world_malaria_report_2012/en/index.html.
24. Bray F, Ren JS, Masuyer E, Ferlay J. Global estimates of cancer prevalence for 27 sites in the adult population in 2008. *Int J Cancer*. 2013 Mar 1;132(5):1133-45.

25. Parkin DM, Nambooz S, Wabwire-Mangen F, Wabinga HR. Changing cancer incidence in Kampala, Uganda, 1991-2006. *Int J Cancer*. 2010 Mar 1;126(5):1187-95
26. CE Faggons, C Mabedi, CG Shores, S Gopal, Review: Head and neck squamous cell carcinoma in sub-Saharan Africa, *Malawi Medical Journal*; 27(3): 79-87 September 2015
27. Parkin DM, Sitas F, Chirenje M, Stein L, Abratt R, Wabinga H. Part I: Cancer in indigenous Africans--burden, distribution, and trends. *Lancet Oncol*. 2008 Jul;9(7):683-92.
28. Shafey O, Dolwick S, Guindon GE (2003) Tobacco control country profiles. 2nd edition, American Cancer Society, Atlanta (GA).
29. American Cancer Society (2007) Global cancer facts & figures 2007. American Cancer Society, Atlanta (GA).
30. Thun MJ, DeLancey JO, Center MM, Jemal A, Ward EM (2010) The global burden of cancer: priorities for prevention. *Carcinogenesis* 31:100-110
31. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA Cancer J Clin* 2011; 61(2):69-90.
32. Boyle P and Bernard Levin. World Cancer Report 2008. International Agency for Research on Cancer
33. Pignon JP, et al. Group OBOTM-NC. Meta-analysis of chemotherapy in head and neck cancer (MACH-NC): An update on 93 randomised trials and 17,346 patients. *Radiotherapy and Oncology*. 2009;92(1):4-14. doi:10.1016/j.radonc.2009.04.014
34. Bernier J, Cooper JS, Pajak TF, van Glabbeke M, Bourhis J, Forastiere A et al. Defining risk levels in locally advanced head and neck cancers: a comparative analysis of concurrent postoperative radiation plus chemotherapy trials of the EORTC (#22931) and RTOG (#9501). *Head Neck*. 2005;27(10):843-50.
35. Stransky N, Egloff A-M, Tward A. et al. The mutational landscape of head and neck squamous cell carcinoma. *Science* 2011;333: 1157-1160.
36. Brunnemann KD, Scott JC, Hoffmann D. N-nitrosomorpholine and other volatile N-nitrosamines in snuff tobacco. *Carcinogenesis* 1982;3: 693-696.
37. Denissenko MF, Pao A, Thng M. et al. Preferential formation of benzo[a]pyrene adducts at lung cancer mutational hotspots in P53. *Science* 1996;274:430-432.
38. Franceschi S, Thlamini R, Barra S, et al. Smoking and drinking in relation to cancers of the oral cavity, pharynx, larynx, and esophagus in northern Italy. *Cancer Res* 1990;50:6502-6507

39. Jeng JH, Chang MC, Hahn U. Role of areca nut in betel quid associated chemical carcinogenesis: current awareness and future perspectives. *Oral Oncol* 2001;37:477-492
40. Schwartz SM, Daling JR, Doody DR, et al. Oral cancer risk in relation to sexual history and evidence of human papillomavirus infection. *J Nat Cancer Inst* 1998;90:1626-1636
41. Ang KK, Harris J, Wheeler R, et al. Human papillomavirus and survival of patients with oropharyngeal cancer. *N Eng J Med* 2010;363:24-35
42. Sankaranarayanan R, Masuyer E, Swaminathan R, Ferlay J, Whelan S. Head and neck cancer: a global perspective on epidemiology and prognosis. *Anticancer Res* 1998;18:4779–86.
43. Silverman S. *Oral Cancer*. Hamilton, London: BC Decker; 1998.

12. ANNEXES

12.1 Questionnaire

St Paul's Hospital Millennium Medical College
Department of ENT

Code number _____

I. Sociodemographic characteristics

No	Questions	Answer
1	Sex	1. Male 2. Female
2	Age	_____ years
3	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others (specify) _____
4	Which part of the country is the patient from?	1. North 4) East 2. South 5) Central 3. West 6) Not from Ethiopia
5	What is the highest education level completed ?	1. Illiterate 2. 1-8th grade 3. 9-10th grade 4. 11-12th grade 5. College and above
6	Marital status?	1. Married 2. Single 3. Divorced 4. Widowed

- 7 Occupation?
- 1.gov't employee
 2. Merchant
 3. Farmer
 4. Pensioner
 5. House wife
 5. Paediatric (<18yrs)
 6. Others (specify) _____
- 8.Cigarette smoking
1. Yes 2. No
9. Alcohol consumption
1. Yes 2. No

II. Malignancy related

A. Anatomic site and sub site of the tumor

1. Lip:

- a) external upper lip (vermillion border)
- b) external lower lip (vermillion border)
- c) commissure

2. Oral cavity:

- a) buccal mucosa
- b) mucosa of the upper and lower lips
- c) cheek mucosa
- d) retro molar area
- e) buccal-alveolar sulci, upper and lower (vestibule of mouth)
- f) upper alveolus and gingiva (upper gum)
- g) lower alveolus and gingiva (lower gum)
- h) hard palate
- i) oral tongue
- j) floor of mouth

3. Oropharynx

- a. base of tongue
- b. vallecula
- c. tonsil
- d. tonsillar pillar
- e. posterior wall
- f. inferior surface of soft palate
- g. uvula

4. *Nasopharynx*

- a) superior wall
- b) posterior wall
- c) lateral walls (fossa of Rosenmuller)
- d) floor (superior surface of the soft palate)

5. *Hypopharynx*

- a) Postcricoid area
- b) Piriform sinus
- c) Posterior pharyngeal wall

6. *Larynx*

A. supraglottis:

- a) suprahoid epiglottis (including tip, lingual, and laryngeal surfaces)
- b) aryepiglottic fold, laryngeal aspect
- c) arytenoid
- d) infrahyoid epiglottis
- e) ventricular bands (false cords)

B. glottis:

- a) true vocal cords (left, right, bilateral)
- b) anterior commissure
- c) posterior commissure

C. subglottis

7. *Nasal cavity and paranasal sinuses*

A. nasal cavity:

- a) septum
- b) floor

- c) lateral wall
- d) vestibule

B. maxillary sinus (left, right, bilateral)

C. ethmoid sinus (left, right, bilateral)

D. frontal sinus (left, right, bilateral)

E. sphenoid sinus (left, right, bilateral)

8. Salivary glands

- a) parotid gland (left, right)
- b) submandibular gland (left, right)
- c) sublingual gland (left, right)

9. Thyroid gland

- a) papillary carcinoma (including those with follicular foci)
- b) follicular carcinoma (including Hürthle cell carcinoma)
- c) medullary carcinoma
- d) undifferentiated (anaplastic) carcinoma

10. Skin carcinoma of the head and neck

- a) BCC
- b) SCC
- c) Melanoma
- d) other(specify)

B. Histopathology type

1. Epithelial

- a) Squamous cell carcinoma
- b) Mucoepidermoid carcinoma
- c) Acinic cell carcinoma
- d) Adenocarcinoma
- e) Adenoid cystic carcinoma
- f) other(specify)

2. Mesenchymal

- a) Angiosarcoma
- b) Leiomyosarcoma
- c) Rhabdomyosarcoma
- d) Fibrosarcoma
- e) Liposarcoma
- f) Osteosarcoma
- g) Chondrosarcoma
- h) Lymphoma
- i) Malignant peripheral nerve sheath tumour
- j) other(specify)

3. *Neuroectodermal*

- a. Malignant melanoma
- b. Olfactory neuroblastoma
- c. Neuroendocrine carcinoma
- d. other(specify)

C. Clinical stage (cTNM)

1. <u>T- Stage</u>	<u>N- Stage</u>	<u>M-Stage</u>	<u>Stage Group</u>
TX	NX	MX	0
T0	N0	M0	1
T is	N1	M1	2
T1	N2		3
T2	N3		4
T3			
T4			

Saint Paul's Hospital Millennium Medical College

Department of Otolaryngology-Head & Neck Surgery

Declaration

I, the undersigned resident, declare that this research project is my original work in partial fulfillment of the requirement for the specialty certificate in Otolaryngology-Head & Neck

Surgery. I also declare that it has never been presented in this or any other higher institution and that all resources and materials used in the research work have been duly acknowledged.

Name of the Resident _____

Signature _____

Date _____

Advisors Approval

This research work has been submitted for examination with my approval

1. Name _____

Signature _____

Date _____

2. Name _____

Signature _____

Date _____