

# AN ASSESSMENT OF KNOWLEDGE AND AWARENESS OF ORAL AND OROPHARYNGEAL CANCER

A Dissertation submitted to the Department of Pharmacy, East West University,  
Bangladesh, in partial fulfillment of the requirements for the Degree of Bachelor of  
Pharmacy.

Submitted by

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## Dedication

This research work is dedicated to my beloved parents, honorable faculties and loving friends.

## **Declaration by the Candidate**

I, Sayket Saha, hereby declare that the dissertation entitled “An assessment of knowledge and awareness of Oral and Oropharyngeal cancer” among the people of Bangladesh aged 20 to 40 submitted by me to the Department of Pharmacy, East West University and in the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, work carried out by me during the period 2016 of my research in the Department of Pharmacy, East West University, under the supervision and guidance of Ms. Meena Afroze Shanta, Lecturer, Department of Pharmacy, East West University. The thesis paper has not formed the basis for the award of any other degree/diploma/fellowship or other similar title to any candidate of any university.

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## **Certificate by the Supervisor**

This is to certify that the thesis entitled “An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among the people of Bangladesh aged 20 to 40” submitted to the Department of Pharmacy, East West University for the partial fulfillment of the requirement for the award of the degree Bachelor of Pharmacy, was carried out by Sayket Saha, ID: 2012-3-70-039, during the period 2016 of his research in the Department of Pharmacy, East West University, under the supervision and guidance of me. The thesis has not formed the basis for the award of any other degree/diploma/fellowship or other similar title to any candidate of any university.

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### **Certificate by the Chairperson**

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## **List of Abbreviation**

AIDS	: Acquired Immunodeficiency Syndromes
CI	: Confidence Interval
EGFR	: Epidermal Growth Factor Receptor
FNA	: Fine Needle Aspiration
FU	: Fluorouracil
GP	: General Practitioner
GVHD	: Graft –versus-host disease
HNSCC	: Head and Neck Squamous Cell Cancer
HPV	: Human Papilloma Virus
IARC	: International Agency for Research on Cancer
OPC	: Oropharyngeal Cancer
OR	: Odds Ratio
OSCC	: Oral Squamous Cell Cancer
QOL	: Quality Of Life
SCC	: Squamous Cell Cancer
UV	: Ultra Violet
WHO	: World Health Organization

## Abstract

In the developing countries oropharyngeal cancer is a great concern for the people living there. Oral cancer is very alarming disease that affects many people each year all over the world. It is the eleventh most dominate cancer in the world. In Bangladesh more than 7000 people are newly diagnosed each year and among them 6.6% people are died due to their life style and other factors. The aim of the study was to identify the understanding of oropharyngeal cancer among Bangladeshi people the prevalence of oropharyngeal cancer and the relationship between the life style risk factors and oropharyngeal cancer. A total of 300 respondents of different spheres of life participated in the study. They responded to structured questionnaires which was setup by following STEPS guideline. Regarding 38% were non-smoker, 58% were current smoker and 4% were former smoker. 100% of the current smokers take more than 10 packs of cigarette in a year. 81% of people never intake any type of alcohol where 16% intake light alcohol and rest of 3% intake heavy alcohol. 71% of people used mouth wash once daily and % were using twice daily but only 5% people knew that mouthwash contains high alcohol. 4 % people knew about oropharyngeal cancer and 82 % of them thought that oropharyngeal cancer developed in back of throat and all of them thought that Smoking is responsible for developing it. 74% of people preferred Chemotherapy as the treatment of oropharyngeal cancer and 99% thought that HPV (Human Papilloma Virus) vaccine helped to keep free from oropharyngeal cancer. 41% thought that stopping the use of tobacco Products will be the preventative way to get free from oropharyngeal cancer. According to the questionnaire whether they were introduced with their oral health majority portion of the respondents answered in a positive manner. But result showed that they are careless about their oral health and rarely consults a GP or dentist. At this point, promoting oral health awareness programs and increasing social awareness and taking preventing measures related to the risk factors Oral and Oropharyngeal cancer things might provide a good solution.

**Key words:** Oropharyngeal cancer, Bangladesh, Steps, Risk factors, HPV, Oral helath.

# Chapter-1

## Introduction

## **1.1 Overview**

Oral cavity cancer, or just oral cancer, is cancer that starts in the mouth (also called the oral cavity). Oropharyngeal cancer starts in the oropharynx, which is the part of the throat just behind the mouth.

Squamous cell cancer of the oropharynx is the most common type of oropharyngeal cancer. Other rare types of cancer can develop in the oropharynx, such as salivary gland cancer, melanoma, lymphoma, small cell cancer and sarcoma (Macmillan.org.uk, 2016).

Tumours of the oral cavity and oropharynx may be either epithelial, mesenchymal, or haematolymphoid. The epithelial tumours may be classified as those originating within the epithelium lining of the oral cavity and oropharynx and those derived from salivary gland tissue (Griffiths, Horton-Szar and Lombard, 2012).

## **1.2 Epidemiology**

### **1.2.1 Oropharyngeal cancer in Canada**

Oral cancer is prevalent worldwide but is very common in some countries such as India, Pakistan, and Taiwan and in some areas of France. Although less frequent in Canada, oral cancer was diagnosed in 3,200 people and responsible for 1,100 deaths in 2007. To put this into perspective, currently in Canada, more cases of oral cancer are diagnosed in a year than cervical or ovarian cancer, and more deaths occur from oral cancer than from melanoma or cervical cancer. With growing immigration from high-risk areas such as India, the number of cases of oral cancer will increase. Since nasopharyngeal cancers are routinely included in oral cancer statistics, we estimate that dental professionals could potentially detect about 2,700 (84%) of these 3,200 cases. Oral cancer is often diagnosed at an advanced stage, and the overall survival rate 5 years after diagnosis is about 62% for all sites combined and 65% for the sites shown in Table 1. Survival has improved a little over the last several decades, perhaps because of a reduction in smoking. Patients over 60 years of age are at the greatest risk; however, the incidence of oral cancer has increased in patients less than 40 years of age, perhaps because of changing risk factors.

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About 6% of oral cancers occur among persons under 40 years of age. Although the overall ratio of males to females with oral cancer in Canada is 2:1, the ratio is almost 1:1 in patients under 40. The overall incidence in Canada is about 12 per 100,000 per year in men and 5 per 100,000 in women. Rates are somewhat higher in eastern than in western Canada (M. Laronde *et al.*, 2008).

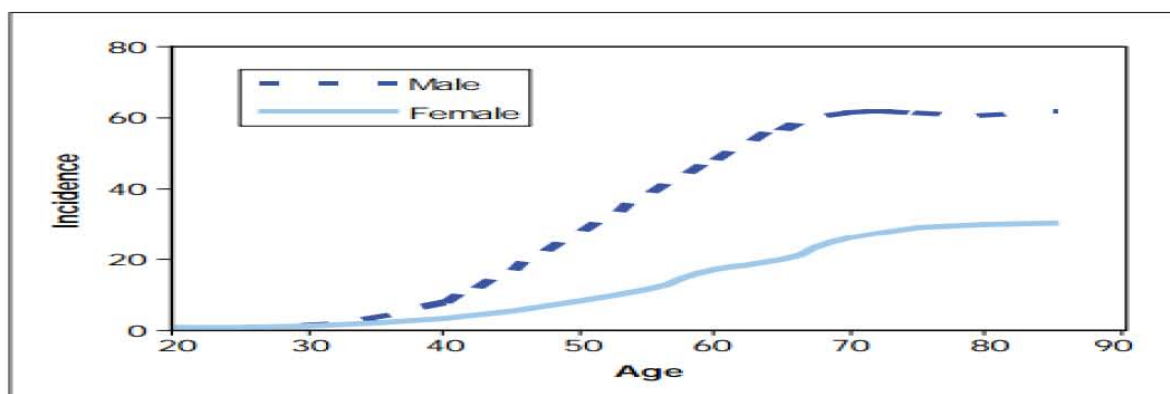


Figure 1.1: Annual incidence rate for new oral cancers by age and sex of US

Table 1.1: distribution and survival rates for oral cancer amenable to dental cleaning and early detection of Canada 2007

Subsite of cancer	Number of new cases (n = 2,690)	% distribution	5-year survival rate (mean 65)
Lip	341	13	94
Tongue	740	27	53
Gum and other mouth	509	19	60
Floor of mouth	281	10	53
Salivary gland	348	13	74
Tonsil	379	14	50
Oropharynx	93	3	50

*Estimates based on data from the United States<sup>1</sup> and Canada.<sup>2</sup>*

### **1.2.2 Oropharyngeal cancer around the world:**

The American Cancer Society's most recent estimates for oral cavity and oropharyngeal cancers in the United States are for 2016 and About 48,330 people will get oral cavity or oropharyngeal cancer. An estimated 9,570 people will die of these cancers.

These cancers are more than twice as common in men as in women. They are about equally common in blacks and in whites. In recent years, the overall rate of new cases of this disease has been stable in men and dropping slightly in women. However, there has been a recent rise in cases of oropharyngeal cancer linked to infection with human papilloma virus (HPV) in white men and women. The death rate for these cancers has been decreasing over the last 30 years.

The average age of most people diagnosed with these cancers is 62, but they can occur in young people. They are rare in children, but a little more than one-quarter occur in patients younger than 55. The rates of these cancers vary among countries. For example, they are much more common in Hungary and France than in the United States and much less common in Mexico and Japan. When patients newly diagnosed with oral and oropharyngeal cancers are carefully examined, a small portion will have another cancer in a nearby area such as the larynx (voice box), the esophagus (the tube that carries food from the throat to the stomach), or the lung. Some who are cured of oral or oropharyngeal cancer will develop another cancer later in the lung, mouth, throat, or other nearby areas. For this reason, people with oral and oropharyngeal cancer will need to have follow-up exams for the rest of their lives. They also need to avoid using tobacco and alcohol, which increase the risk for these second cancers (Cancer.org, 2016).

Salivary gland cancer incidence has increased by around 37%, though the numbers remain small. The reasons for this rise are unclear, but analysis of trends in different pathological subtypes might be informative.

Oropharyngeal cancer incidence has more than doubled – the biggest rise in any head and neck cancer. Recent research suggests a change in patterns of causation, with human

papilloma virus (rather than smoking and alcohol) being the primary risk factor in a younger subpopulation.

The incidence of palate cancer has increased by 66%. The reasons for this are unclear; further work is needed to establish whether the rise is primarily in soft palate cancer (matching the rise in oropharyngeal cancer) or hard palate cancer.

The incidence of thyroid cancer has doubled. This may be due in part to increased detection of small papillary carcinomas through the imaging of goitres.

Incidence rates for all types of cancer (averaged over the last four years of the study period) vary significantly between the Strategic Health Authorities and Cancer Networks with the lowest and highest incidence, but the geographical pattern of distribution varies from cancer to cancer. This may reflect the distribution of different risk factors, including those that predominantly affect certain ethnic groups. A general pattern of higher incidence in the north and west of the country is common but not universal; London often has high rates too, and the highest rates of oral cancer, nasopharyngeal cancer and palate cancer are found in parts of London.

The average national incidence rates vary from 0.39 per 100,000 populations for nasopharyngeal cancer (an average of 208 cases per year across England) to 3.01 for laryngeal cancer and 3.02 for oral cancer (an average of 1729 and 1767 cases per year respectively).

### **1.2.3 Oropharyngeal cancer in Asia:**

The problem of cancer is universal; the only variation occurs in types, site or other clinic epidemiologic parameters. Tobacco chewing was identified as its cause about century ago but continued practice and research proved it as the most important avoidable factor of oral cancer. Head and neck cancers account for one of the fourth of all cancers in Indian males. In south Asia oral cancers account for about up to 40% of all cancers. In India the incidence of oral cancer is about 3-7 times more common as compared to resource rich countries. India tops in the prevalence of oral cancer in the world and remains the commonest cancer amongst the male population. Oral cancer is the third most common cancer in India after cervical and breast cancer amongst women. In India, the age

standardized incidence rate of oral cancer is reported at 12.6 per 100,000 people. The increased prevalence of the oral cancer in the Indian subcontinent seems to be due to the high exposure to sunlight due to farming, smoking and other smokeless tobacco habits, alcohol, spicy food, and neglect of overall oral health. It is said that one third of all oral cancers are preventable and one third of them occur due to risk factors. The highest age-adjusted incidence for oral cancer is highest in India, i.e. 15.7 per 100, 000 and lowest in Japan which is 0.2 per 100,000 and the difference is predominantly due to use of tobacco between the two nations. In the West, the cancer of tongue and floor of mouth is common whereas in Indian subcontinent the cancers of gingival and buccal mucosa are common due to placement of tobacco quid in the oral cavity. This cancer of gingivobuccal complex is termed as Indian oral cancer (Khan Z., 2012).

Oral cancer is a debilitating and lethal disease with generally increasing incidence and consistently low survival rates for the past three decades. It is a cause of great concern all over the world and a major threat to public health in Pakistan, though a wide geographical variation in incidence and mortality is observed. It is the eighth most common malignancy internationally but in Pakistan it is the second commonest as per recent records of an established and well maintained cancer registry of Shaukat Khanum Memorial Hospital. It accounts for 15% of all new cancer cases in this region in comparison to 3% detected worldwide. The oral cancer incidence rates are the highest in Pakistan and India. The age standardized rates of worldwide incidence and mortality for oral cancer are 5.3 and 2.6 in males and 2.6 and 1.2 in females, respectively.

Most cases have been reported in middle and older age groups but in recent years a number of studies have shown earlier age of incidence. More than 90% of cases of oral cancer are Squamous cell carcinomas (OSCC).

OSCC has a multifactorial etiology with contributions of both genetic and environmental influences, suggesting an overwhelming role of the latter. Majority of the cases are attributable to separate and combined habits of tobacco use (smoked and chewed), alcohol consumption, betel quid, areca nut and betel quid substitutes. A number of recent studies are confirming the putative role of Human Papilloma Virus, especially in the western world, which still needs to be investigated in our population.

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Tobacco and alcohol are globally accepted and well documented strongest risk factors, most prevalent in the western countries with a multiplicative synergistic effect that has been shown in a number of studies. Developing Asian countries present a different scenario with greater prevalence of tobacco, betel quid, areca nut and its substitutes as major carcinogenic influences.

Almost 90% of all oral cancers are caused by tobacco. Cigarettes are the most common of the various forms of smoked tobacco. Smokers have 27 fold more chances of developing OSCC in comparison with non-smokers. Reduction or cessation in smoking leads to a decrease in its incidence and mortality (Brown L. *et al.*, 2012).

Sri Lanka is facing a precarious health problem with oral and pharyngeal cancer (OPC) having the highest age standardized rate per 100,000 populations for oral cancer in Asia and ranking 3rd in the world. For pharyngeal cancers Sri Lanka ranks 4th in Asia and 11th in the world.

There is sufficient evidence for a causal role of tobacco, alcohol, betel quid chewing and poor oral hygiene with OPC in Sri Lanka, but lacked association with HPV. Albeit, prevalence of HR-HPV in females diagnosed with cervical cancer has been studied, reports on HPV burden on men and OPC is scarce. However, a study investigated HPV in oral but not pharyngeal cancers in Sri Lanka. Therefore, detection of anti-HR-HPV antibodies in patients of pharyngeal cancer in the present study provides novel insights to the risks of OPC in Sri Lanka (Gunasekera *et al.*, 2015).

#### **1.2.4 Oropharyngeal cancer in Bangladesh:**

Oral health is very important part of human health and cannot lead healthy life without it. A good oral health enables a person to eat, speak and socialize without active diseases, discomfort or embarrassment. Many general diseases are first indication of poor oral health and one of them is oral cancer. Oral cancer is very disastrous disease that affects many people each year all over the world and it is the eleventh most dominant cancer in

the world according to the World Health Organization (WHO). Oral cancer mostly affects in the area of lips, tongue, mouth, salivary glands and oropharynx.

In Bangladesh more than 7000 people are newly diagnosed each year and among them 6.6% people are died due to their life style and other factors. However, Government has already taken lots of initiative to make people conscious such as advertisement, community hospital for rural area. But, there is no good infrastructure about oral health in Bangladesh. Due to this challenge, many incidences are not captured in the cancer registry. Also, there no dedicated website about the cancer or not many publications are found on the web (Sultana and Malik, 2014).

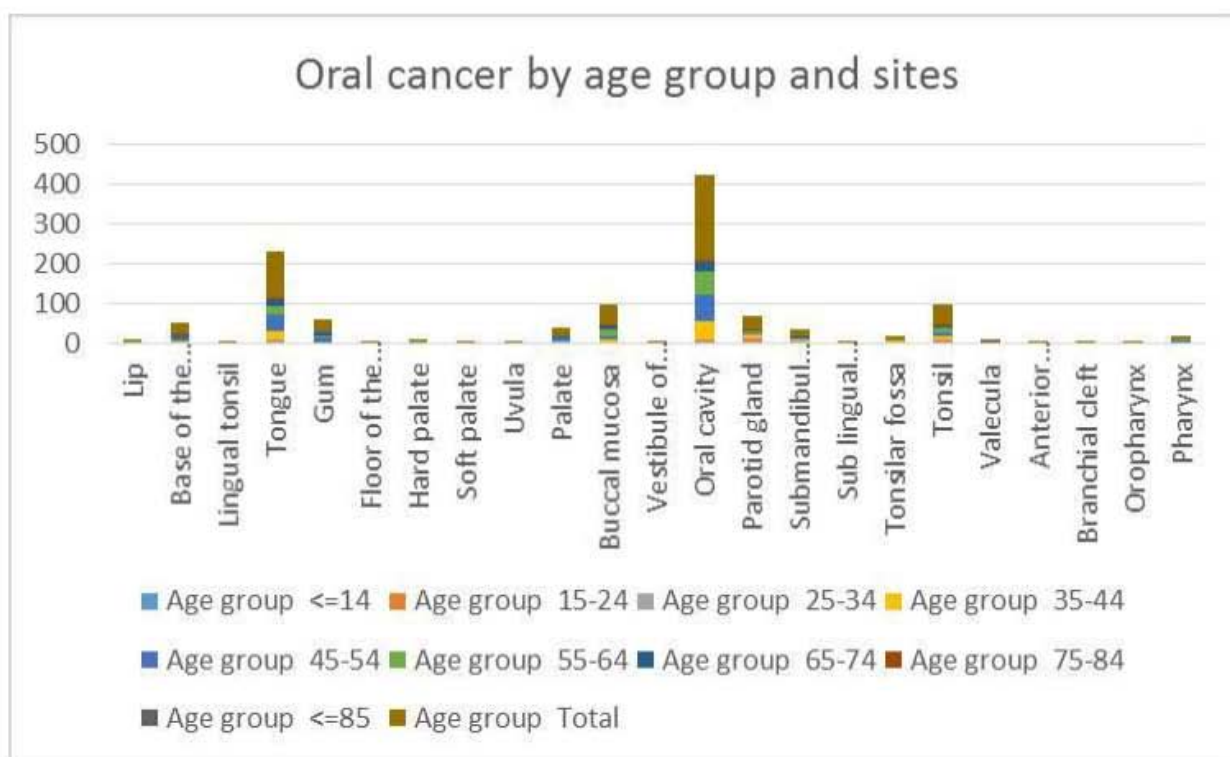


Figure 1.2: Oral cancer by age group and sites in Bangladesh

### 1.3 The oral cavity (mouth) and oropharynx (throat)

The oral cavity includes the lips, the inside lining of the lips and cheeks (buccal mucosa), the teeth, the gums, the front two-thirds of the tongue, the floor of the mouth below the

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tongue, and the bony roof of the mouth (hard palate). The area behind the wisdom teeth (called the retromolar trigone) can be included as a part of the oral cavity, although it is often considered part of the oropharynx (Cancer.org, 2016).

The oropharynx is the part of the throat directly behind the mouth. This area helps you speak and swallow. ‘Oro’ means mouth and ‘pharynx’ is the throat. The oropharynx includes the:

Soft part of the roof of the mouth (soft palate)

Base of the tongue (the part you can’t see)

Side walls of the throat (where the tonsils are)

Back wall of the throat (posterior pharyngeal wall) (Macmillan.org.uk, 2016)

The oral cavity and oropharynx helps to breathe, talk, eat, chew, and swallow. Minor salivary glands throughout the oral cavity and oropharynx make saliva that keeps your mouth moist and helps to digest food (Cancer.org, 2016).

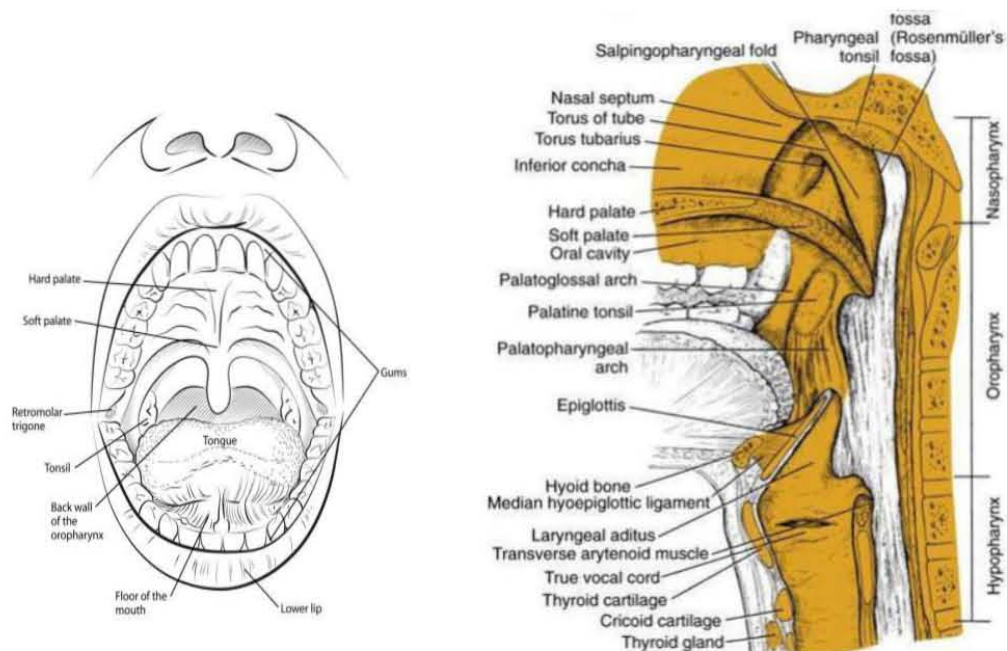


Figure 1.3: Oral cavity and oropharynx

The oropharynx lies behind the oral cavity. It is bounded superiorly by the soft palate and inferiorly by a hypothetical horizontal line level with the tip of the epiglottis. Anteriorly are the isthmus of the fauces and the posterior third of the tongue, and the lateral wall is formed by the palatopharyngeal arches and the palatine tonsils. The posterior wall contains the pharyngeal tonsils. The palatine tonsils are two masses of lymphoid tissue situated in the triangular recess (tonsillar sulcus) between the anterior and posterior faucial pillars. They extend from the soft palate to the dorsum of the tongue. The surface is convoluted and deep clefts or crypts can penetrate almost its full thickness. The bulk of the tonsil consists of lymphoid tissue arranged in nodules or follicles. There are no afferent lymphatics and no subcapsular sinuses. Squamous cell carcinomas at this site can invade deeply into the underlying tissues, base of tongue and lateral pharyngeal wall. They also have a particular tendency to extend upwards into the nasopharynx. The soft palate is a mobile, muscular flap attached to the posterior edge of the hard palate and extending to a free margin posteriorly. The uvula forms a small, conical, midline process. The oral surface of the soft palate is covered by nonkeratinized stratified squamous epithelium and contains many minor mucous glands. The uvula contains mainly fat and a few muscle fibres but minor salivary glands may also be seen and occasionally salivary gland tumours develop at this site. The pharyngeal part of the tongue is immobile and has a bossellated surface due to the presence of underlying lymphoid tissue forming the lingual tonsils. Minor salivary glands are also present (Griffiths, Horton-Szar and Lombard, 2012).

The different parts of the oral cavity and oropharynx are made up of several types of cells. Different cancers can develop from each type of cell. The differences are important, because they can influence a person's treatment options and prognosis. Cancers can also start in other parts of the throat like-

- Cancers of the nasopharynx (the part of the throat behind the nose and above the oropharynx)
- Cancers that start in the larynx (voice box) or the hypopharynx (the part of the throat below the oropharynx) (Cancer.org, 2016).



## 1.4 Tumors and growths in the oral cavity and oropharynx

Many types of tumors (abnormal growths of cells) can develop in the oral cavity and oropharynx. They fit into 3 general categories:

- Benign or non-cancerous growths that do not invade other tissues and do not spread to other parts of the body.
- Harmless growths that can later develop into cancer. These are known as precancerous conditions.
- Cancerous tumors that can grow into surrounding tissues and spread to other parts of the body.

### 1.4.1 Benign (non-cancerous) tumors oral cancer

Many types of benign tumors and tumor-like conditions can start in the mouth or throat:

Table 1.2: Types of benign tumors in the mouth or throat

Eosinophilic granuloma	Neurofibroma
Fibroma	Papilloma
Granular cell tumor	Condyloma acuminatum
Keratoacanthoma	Verruciform xanthoma
Leiomyoma	Pyogenic granuloma
Osteochondroma	Rhabdomyoma
Lipoma	Odontogenic tumors (tumors that start in tooth-forming tissues)
Schwannoma	

### 1.4.2 Leukoplakia and erythroplakia (possible pre-cancerous conditions)

Leukoplakia and erythroplakia are terms used to describe certain types of abnormal tissue that can be seen in the mouth or throat:

- Leukoplakia is a white or gray patch.

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- Erythroplakia is a flat or slightly raised red area that often bleeds easily if it is scraped.
- Erythroleukoplakia is a patch with both red and white areas.

Dysplasia is graded as mild, moderate, or severe, based on how abnormal the tissue looks under the microscope. Knowing the degree of dysplasia helps predict how likely it is to progress to cancer or to go away on its own or after treatment. For example, severe dysplasia is more likely to become a cancer, while mild dysplasia is more likely to go away completely. The most frequent causes of leukoplakia and erythroplakia are smoking and chewing tobacco. Poorly fitting dentures that rub against the tongue or the inside of the cheeks can also cause these conditions (Khan Z., 2012).

#### **1.4.3 Squamous cell carcinomas**

More than 90% of cancers of the oral cavity and oropharynx are squamous cell carcinomas, also called squamous cell cancers. These cancers begin in early forms of squamous cells, which are flat, scale-like cells that normally form the lining of the mouth and throat. The earliest form of squamous cell cancer is called carcinoma in situ, meaning that the cancer cells are present only in the outer layer of cells called the epithelium. This is different from invasive squamous cell carcinoma, where the cancer cells have grown into deeper layers of the oral cavity or oropharynx (M. Laronde *et al.*, 2008).

#### **1.4.4 Verrucous carcinoma**

Verrucous carcinoma is a type of squamous cell carcinoma that makes up less than 5% of all oral cancers. It is a low-grade (slow growing) cancer that rarely spreads to other parts of the body, but it can grow deeply into surrounding tissue. If they are not treated, areas of ordinary squamous cell cancer may develop within some verrucous carcinomas. Some verrucous carcinomas may already have areas of ordinary squamous cell cancer that are not recognized in the biopsy sample. Cells from these areas of squamous cell carcinoma may then spread to other parts of the body. For all of these reasons, verrucous carcinomas should be removed promptly, along with a wide margin of surrounding normal tissue.

#### **1.4.5 Minor salivary gland carcinomas**

Minor salivary gland cancers can develop in the glands in the lining of the mouth and throat. There are several types of minor salivary gland cancers, including adenoid cystic carcinoma, mucoepidermoid carcinoma, and polymorphous low-grade adenocarcinoma.

#### **1.4.6 Lymphomas**

The tonsils and base of the tongue contain immune system (lymphoid) tissue, where cancers called lymphomas can start. For more information about these cancers, see the American Cancer Society documents Non-Hodgkin Lymphoma, Non-Hodgkin Lymphoma in Children, and Hodgkin disease (cancer.org, 2016).

### **1.5 Cause and risk factors for oral cavity and oropharyngeal cancers**

#### **1.5.1 Tobacco and alcohol**

Tobacco and alcohol use are among the strongest risk factors for oral cavity and oropharyngeal cancers. Most people with oral cavity and oropharyngeal cancers use tobacco, and the risk of developing these cancers is related to how much and how long they smoked or chewed. Smokers are many times more likely than non-smokers to develop these cancers.

Tobacco smoke from cigarettes, cigars, or pipes can cause cancers anywhere in the mouth or throat, as well as causing cancers of the larynx (voice box), lungs, esophagus, kidneys, bladder, and several other organs. Pipe smoking is a particularly significant risk for cancers in the area of the lips that touch the pipe stem. It is important for smokers who have been treated for oral cavity or oropharyngeal cancer to quit smoking, even if their cancer seems to be cured. Continuing to smoke greatly increases their risk of developing a second cancer of the mouth, throat, larynx (voice box), or lung. Oral tobacco products (snuff or chewing tobacco) are linked with cancers of the cheek, gums, and inner surface of the lips. Using oral tobacco products for a long time poses an especially high risk. These products also cause gum disease, destruction of the bone sockets around teeth, and

tooth loss. It is also important for people who have been treated for oral cavity or oropharyngeal cancer to give up any oral tobacco products.

### **1.5.2 Drinking and smoking**

The risk of these cancers is even higher in people who both smoke and drink alcohol, with the highest risk in heavy smokers and drinkers. According to some studies, the risk of these cancers in heavy drinkers and smokers may be as much as 100 times more than the risk of these cancers in people who don't smoke or drink.

### **1.5.3 Betel quid and gutka**

In Southeast Asia, South Asia, and certain other areas of the world, many people chew betel quid, which is made up of areca nut and lime wrapped in a betel leaf. Many people in these areas also chew gutka, a mixture of betel quid and tobacco. People who chew betel quid or gutka have an increased risk of cancer of the mouth (Khan Z., 2012).

### **1.5.4 Human papilloma virus (HPV)**

Human papilloma virus (HPV) is a group of more than 150 types of viruses. They are called papilloma viruses because some of them cause a type of growth called a papilloma. Papillomas are not cancers, and are more commonly called warts. Infection with certain types of HPV can also cause some forms of cancer, including cancers of the penis, cervix, vulva, vagina, anus, and throat. Other types of HPV cause warts in different parts of the body. HPV can be passed from one person to another during skin-to-skin contact. One way HPV is spread is through sex, including vaginal and anal intercourse and even oral sex. HPV types are given numbers. The type linked to throat cancer (including cancer of the oropharynx) is HPV16. Most people with HPV infections of the mouth and throat have no symptoms, and only a very small percentage developed oropharyngeal cancer. Oral HPV infection is more common in men than in women. In some studies, the risk of oral HPV infection was linked to certain sexual behaviors, such as open mouth kissing and oral-genital contact (oral sex). The risk also increases with the number of sexual partners a person has. Smoking also increases the risk of oral HPV infection. At this time the US Food and Drug Administration has not approved a test for HPV infection of the

mouth and throat. The number of oropharyngeal cancers linked to HPV has risen dramatically over the past few decades. HPV DNA (a sign of HPV infection) is now found in about 2 out of 3 oropharyngeal cancers and in a much smaller fraction of oral cavity cancers. The reason for the rising rate of HPV-linked cancers is unclear, although some think that it could be because of changes in sexual practices in recent decades, in particular an increase in oral sex. People with oral and oropharyngeal cancer linked with HPV infection tend to be younger and are less likely to be smokers and drinkers. Oropharyngeal cancers that contain HPV DNA tend to have a better outlook than those without HPV (M. Laronde *et al.*, 2008).

### **1.5.5 Gender**

Oral and oropharyngeal cancers are about twice as common in men as in women. This might be because men have been more likely to use tobacco and alcohol in the past. This is changing, but the recent rise in HPV-linked cancers has been mainly among younger men, so it is still likely to occur more often in men in the near future.

### **1.5.6 Age**

Cancers of the oral cavity and oropharynx usually take many years to develop, so they are not common in young people. Most patients with these cancers are older than 55 when the cancers are first found. But this may be changing as HPV-linked cancers become more common. People with cancers linked to HPV infection tend to be younger.

### **1.5.7 Ultraviolet (UV) light**

Sunlight is the main source of UV light for most people. Cancers of the lip are more common in people who have outdoor jobs where they are exposed to sunlight for long periods of time (Khan Z., 2012).

### **1.5.8 Poor nutrition**

A poor diet may increase your risk of certain types of mouth and oropharyngeal cancer. This may be due to a lack of vitamins and minerals, such as iron or folic acid. Poor diet can lead to a break down in the oral mucosa and this can make it more prone to

developing cancer. A diet high in fresh fruit and vegetables seems to reduce the risk of developing cancer of the mouth. This may be because these foods contain a lot of antioxidant vitamins and other substances that help prevent damage to body cells (cancer.org, 2016).

### **1.5.9 Vitamin/mineral deficiencies**

The protective effects of plant foods might be attributed to various substances, such as carotenoids, vitamins C and E, folate, flavonoids, fiber, and lycopene. In addition, there is an increased risk for SCC of the upper alimentary tract among iron-deficient patients—most notably those with untreated Plummer-Vinson syndrome. Some investigators have noted high rates of vitamin D deficiency in oral/head and neck cancer patients; a weak inverse association between oral/pharyngeal cancer and dietary vitamin D intake; and correlations between smoking, alcohol, and vitamin D deficiency (Chi, Day and Neville, 2015).

### **1.5.10 Weakened immune system**

Oral cavity and oropharyngeal cancers are more common in people who have a weak immune system. A weak immune system can be caused by certain diseases present at birth, the acquired immunodeficiency syndrome (AIDS), and certain medicines (such as those given after organ transplants) (M. Laronde *et al.*, 2008).

### **1.5.11 Graft-versus-host disease**

Graft-versus-host disease (GVHD) is a condition that sometimes occurs after a stem cell transplant. During this medical procedure, blood stem cells from a donor are used to problems at an early age, which may lead to leukemia or aplastic anemia. They also have a very high risk of cancer of the mouth and throat.

### **1.5.12 Occupational exposure**

In a population-based case-referent study, the occupational experience of 86 men with oral or oropharyngeal cancer and 373 referents was analyzed with respect to employment in 41 occupations and 40 industries, as well as to exposure to 16 chemicals, as estimated

via a job-exposure matrix. Among the occupations and industries at higher risk were machinery operator (odds ratio [OR] 2.0; 95% confidence interval [95% CI] 1.0-4.0), plumber (OR 5.0, 95% CI 1.2-21.5), building industry (OR 2.5; 95% CI 1.3-4.5), textile industry (OR 2.5; 95% CI 0.6-4.6), and electricity production (OR 2.8; 95% CI 0.7-12.1). All the OR estimates were adjusted for age, education, area of birth, tobacco smoking, and alcohol consumption. An association between formaldehyde exposure and oral cancer was suggested (OR for any exposure 1.6, 95% CI 0.9-2.8; OR for probable or definite exposure 1.8, 95% CI 0.6-5.5). No other chemical included in the matrix showed any risk pattern. The evidence of an association between formaldehyde exposure and oral or oropharyngeal cancer is strengthened by the results of this study (Merletti F, 2016).

Some of the Occupational exposure are-

- Formaldehyde and wood dust are classified by the International Agency for Research on Cancer (IARC) as causes of nasopharyngeal cancer. An estimated 11% of nasopharyngeal cancers in men in Great Britain, and around 2% in women, are linked to occupational exposure to formaldehyde or wood dust.
- Nasopharyngeal cancer death risk may not be associated with formaldehyde exposure, cohort studies have shown; however evidence is mixed.
- Nasopharyngeal cancer death risk may be 2.4 times higher in furniture and plywood workers, a pooled analysis showed; however evidence is mixed.
- Asbestos and exposure to printing processes (which may entail exposure to polycyclic aromatic hydrocarbons and mineral oils) are classified by IARC as probable causes of pharynx cancer, based on limited evidence.
- Oral and pharyngeal cancer risk is 25% higher in people exposed to asbestos, compared with the general population, a meta-analysis showed.
- Oral and pharyngeal cancer risk is 14% higher in people exposed to polycyclic aromatic hydrocarbons (Cancer Research UK, 2015).
- Nickel is used in the production of stainless steel, copper–nickel alloys and other corrosion-resistant alloys, as well as in electroplating, as a chemical catalyst, and in the manufacture of alkaline batteries, coins, welding products, magnets, electrical contacts and electrodes, spark plugs, machinery parts and surgical and

dental prostheses. Exposure to nickel occurs by inhalation, ingestion and skin contact of airborne fumes, dusts and mists in nickel and nickel alloy production plants, as well as in welding, electroplating, grinding and cutting operations (Slack, Young and Rushton, 2012).

### **1.5.13 Unproven or controversial risk factors**

#### **1.5.13.1 Mouthwash**

Some studies have suggested that mouthwash with high alcohol content might be linked to a higher risk of oral and oropharyngeal cancers. But recent research has questioned these results. Studying this possible link is complicated by the fact that smokers and frequent drinkers (who already have an increased risk of these cancers) are more likely to use mouthwash than people who neither smoke nor drink.

#### **1.5.13.2 Irritation from dentures**

It has been suggested that long-term irritation of the lining of the mouth caused by poorly fitting dentures is a risk factor for oral cancer. But many studies have found no increased risk in denture wearers overall.

Poorly fitting dentures can tend to trap agents that have been proven to cause oral cancer, such as alcohol and tobacco particles, so denture wearers should have them checked by a dentist regularly to ensure a good fit. All denture wearers should remove their dentures at night and clean and rinse them thoroughly every day (cancer.org, 2016).

## **1.6 Signs and symptoms of oral cavity and oropharyngeal cancer**

Possible signs and symptoms of these cancers can include:

- Sore in the mouth or on the lip that does not heal; this is the most common symptom
- Red or white patch on the gums, tongue, tonsil, or lining of the mouth
- Lump on the lip, mouth, neck, or throat or a feeling of thickening in the cheek

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- Persistent sore throat or feeling that something is caught in the throat
- Hoarseness or change in voice
- Numbness of the mouth or tongue
- Pain or bleeding in the mouth
- Difficulty chewing, swallowing, or moving the jaws or tongue
- Ear and/or jaw pain
- Chronic bad breath
- Changes in speech
- Loosening of teeth or toothache
- Dentures that no longer fit
- Unexplained weight loss
- Fatigue
- Loss of appetite, especially when prolonged; this may happen during the later stages of the disease (Cancer.Net, 2012)

## **1.7 Diagnosis of oropharyngeal cancers**

### **1.7.1 Exams by a doctor**

#### **1.7.1.1 Medical history and physical exam**

As a first step, doctor will probably ask patient questions about symptoms, possible risk factors, and any other medical conditions. Doctor will examine to look for possible signs of an oral or oropharyngeal cancer (or pre-cancer) like bumps or other abnormal areas on your head, face or neck, or problems with the nerves of the face and mouth. The doctor will look at the entire inside of your mouth, and might feel around in it with a gloved finger. He or she may also use other tests to look for abnormal areas in the mouth or throat, or to get a better sense of what an abnormal area might be.

#### **1.7.1.2 Complete head and neck exam**

The specialist will pay special attention to the head and neck area, being sure to look and feel for any abnormal areas. This exam will include the lymph nodes of the neck, which will be felt carefully for any signs of cancer. Because the oropharynx is deep inside the neck and some parts are not easily seen, the doctor may use mirrors or special fiber-optic scopes to examine these areas while patient is in the doctor's office.

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### **1.7.1.3 Indirect pharyngoscopy and laryngoscopy**

For this exam, the doctor uses small mirrors placed at the back of mouth to look at the throat, base of the tongue, and part of the larynx (voice box).

### **1.7.1.4 Direct (flexible) pharyngoscopy and laryngoscopy:**

For this exam, the doctor inserts a flexible fiber-optic scope (called an endoscope) through the mouth or nose to look at some areas that can't easily be seen with mirrors, such as the region behind the nose (nasopharynx) and the larynx, or to see certain areas clearer (Khan Z., 2012).

### **1.7.2 Panendoscopy**

During a panendoscopy, the doctor uses different types of endoscopes passed down the mouth or nose to perform laryngoscopy, esophagoscopy, and (at times) bronchoscopy. This lets the doctor thoroughly examine the oral cavity, oropharynx, larynx (voice box), esophagus (tube leading to the stomach), and the trachea (windpipe) and bronchi (breathing passageways in the lungs). This exam is usually done in an operating room while patients are under general anesthesia (asleep). The doctor uses a laryngoscope to look for tumors in the throat and larynx. Other parts of the mouth, nose, and throat are examined as well. If a tumor is found that is large or seems likely to spread, the doctor may also need to use an esophagoscope to look into the esophagus or a bronchoscope to look into the trachea and bronchi (M. Laronde *et al.*, 2008).

### **1.7.3 Biopsy**

In a biopsy, the doctor removes a sample of tissue to be looked at under a microscope. The actual diagnosis of oral and oropharyngeal cancers can only be made by a biopsy. A sample of tissue or cells is always needed to confirm that cancer is really present before treatment is started. Several types of biopsies may be used, depending on each case. All biopsy samples are sent to a lab to be viewed under a microscope by a pathologist, a doctor who is specially trained to diagnose cancer with lab tests. The doctor can usually tell cancer cells from normal cells, as well as what type of cancer it is, by the way the

cells look. In some cases, the doctor may need to coat the cells with special stains to help tell what type of cancer it is.

#### **1.7.4 Exfoliative cytology**

In this technique, the doctor scrapes a suspicious area and smears the collected tissue onto a glass slide. The sample is then stained with a dye so the cells can be seen under the microscope. If any of the cells look abnormal, the area can then be biopsied. The advantage of this technique is that it is easy, and even only slightly abnormal-looking areas can be examined. This can make for an earlier diagnosis and a greater chance of cure if there is cancer. But this method does not detect all cancers. Sometimes it's not possible to tell the difference between cancerous cells and abnormal but non-cancerous cells (dysplasia) with this approach, so a biopsy would still be needed.

#### **1.7.5 Incisional biopsy**

For this type of biopsy, the doctor cuts a small piece of tissue from an area that looks abnormal. This is the most common type of biopsy to sample areas in the mouth or throat. The biopsy can be done either in the doctor's office or in the operating room, depending on where the tumor is and how easy it is to get a good tissue sample. If the tumor is deep inside the mouth or throat, the biopsy might be done in the operating room with the patient under general anesthesia (in a deep sleep). The surgeon uses special instruments through an endoscope to remove small tissue samples (Khan Z., 2012).

#### **1.7.6 Fine needle aspiration (FNA) biopsy**

For this test, the doctor uses a very thin, hollow needle attached to a syringe to draw (aspirate) some cells from a tumor or lump. These cells are then looked at under a microscope to see if cancer is present. FNA biopsy is not used to sample abnormal areas in the mouth or throat, but is sometimes used when a patient has a neck mass that can be felt or seen on a CT scan.

### **1.7.7 HPV testing**

For cancers of the throat, doctors often have the biopsy samples tested to see if HPV infection is present. This information can help the doctor predict the probable course of the cancer, as people whose cancers are linked to HPV tend to do better than those whose cancers are not.

### **1.7.8 Imaging tests**

Imaging tests use x-rays, magnetic fields, or radioactive substances to create pictures of the inside of your body. Imaging tests are not used to diagnose oral cavity or oropharyngeal cancers, but they may be done for a number of reasons both before and after a cancer diagnosis, including:

To help look for a tumor if one is suspected

To learn how far cancer may have spread

To help determine if treatment has been effective

To look for possible signs of cancer recurrence after (Cancer.org, 2016)

## **1.8 Treatment for oropharyngeal cancer**

Treatments used for oropharyngeal cancer include surgery, radiotherapy, chemotherapy and targeted therapy. If you have a small, early stage cancer, you may be treated with either surgery or radiotherapy. If the cancer is larger or has spread to the lymph nodes, you will usually have a combination of treatments. Often chemotherapy and radiotherapy are given together. This is called chemoradiation. Some people have surgery followed by radiotherapy or chemoradiation.

### **1.8.1 Surgery**

Surgery can be used to remove early stage oropharyngeal cancer. Sometimes surgery is used to treat more advanced stages of oropharyngeal cancer. For small cancers, it may be possible to do the operation through the open mouth. This is called transoral surgery. The surgeon uses a thin flexible tube with a light and camera at the end (endoscope) to see the

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throat clearly. They then carefully remove the cancer, often using a small laser. Transoral surgery doesn't leave any scars on your neck or face. You may also recover faster, and have fewer problems with speech or ability to swallow. If the cancer is larger or in a difficult position the surgeon may do the operation through a cut on the neck. Sometimes they need to remove part of the jawbone or tongue to remove the cancer. The surgeon may use tissue, skin or bone taken from somewhere else in the body to rebuild these areas.

The surgeon may also remove some lymph nodes from neck. Again this is done through a cut on the neck. They may do this to remove cancer that has spread to the lymph nodes, or to reduce the risk of the cancer coming back (Macmillan.org.uk, 2016).

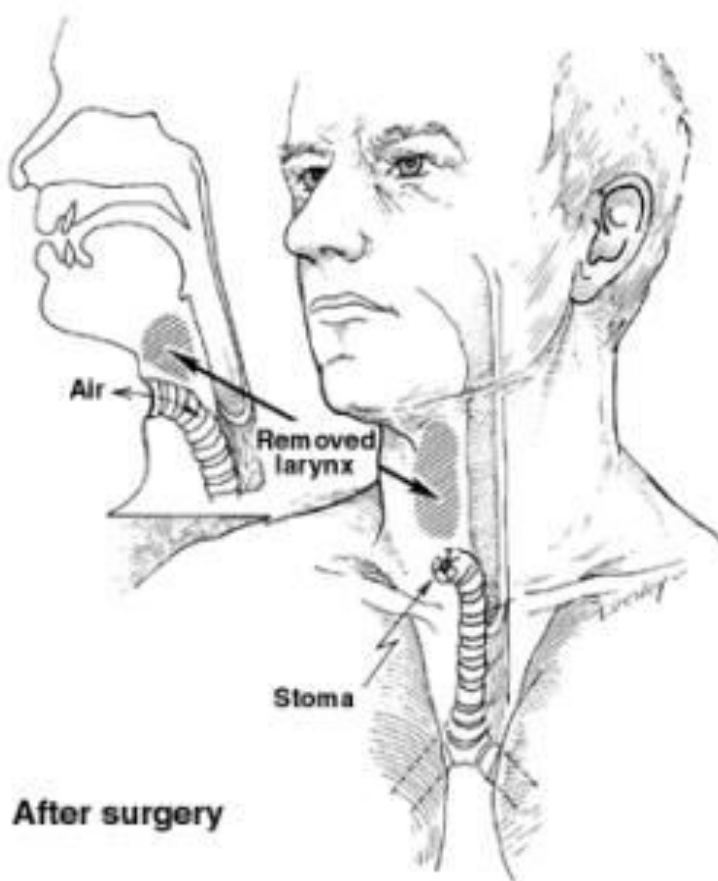


Figure 1.4: Conditions after surgery

### **1.8.1.1 Surgery risks and side effects**

All surgery carries risk, including blood clots, infections, complications from anesthesia, and pneumonia. These risks are generally low but are higher with more complicated operations.

If the surgery is not too complex, the main side effect may be some pain afterward, which can be treated with medicines if needed. Surgery for cancers that are large or hard to reach may be very complicated, in which case side effects may include infection, wound breakdown, problems with eating and speaking, or on very rare occasions death during or shortly after the procedure. Surgery also can be disfiguring, especially if bones in the face or jaw need to be removed. The surgeon's skill is very important in minimizing these side effects, while removing all of the cancer, so it's very important to choose a surgeon with a lot of experience in these types of cancer (Khan Z., 2012).

#### **1.8.1.1.1 Impact of glossectomy**

Most people can still speak if only part of the tongue is removed, but they often notice that their speech isn't as clear as it once was. The tongue is important in swallowing, so this may also be affected. Speech therapy can often help with these problems. When the entire tongue is removed, patients lose the ability to speak and swallow. With reconstructive surgery and a good rehabilitation program including speech therapy, some patients may regain the ability to swallow and speak well enough to be understood.

#### **1.8.1.1.2 Impact of laryngectomy**

Laryngectomy, the surgery that removes the voice box, leaves a person without the normal means of speech. There are several ways to restore one's voice. See our document Laryngeal and Hypopharyngeal Cancer to find out more about voice restoration. After a laryngectomy, the person breathes through a stoma (tracheostomy) placed in the front of the lower neck. Having a stoma means that the air you breathe in and out will no longer pass through your nose or mouth, which would normally help moisten, warm, and filter the air (removing dust and other particles). The air reaching the lungs will be dryer and

cooler. This may irritate the lining of the breathing tubes and cause thick or crusty mucus to build up.

Impact of facial bone removal: Some cancers of the head and neck are treated by operations that remove part of the facial bone structure. Because the changes that result are so visible, they can have a major effect on how people view themselves. They can also affect speech and swallowing. It's important to talk with your doctor before the surgery about what these changes might be to help prepare you for them. He or she can also give you an idea about what options might be available afterward. Recent advances in facial prostheses (man-made replacements) and in reconstructive surgery now give many people a more normal look and clearer speech. Ears and noses can be made out of plastic, tinted to match the skin, and attached to the face. All of these things can be a great help to a person's self-esteem (M. Laronde *et al.*, 2008).

### **1.8.2 Radiotherapy**

Radiation therapy uses high-energy x-rays or particles to destroy cancer cells or slow their rate of growth. Radiation therapy can be used in several situations for oral and oropharyngeal cancers:

It can be used as the main treatment for small cancers.

Patients with larger cancers may need both surgery and radiation therapy or a combination of radiation therapy and chemotherapy or a targeted drug.

After surgery, radiation therapy can be used, either alone or with chemotherapy, as an additional (adjuvant) treatment to try to kill any small deposits of cancer that may not have been removed during surgery. This is known as adjuvant radiation therapy.

Radiation may be used (along with chemotherapy) to try to shrink some larger cancers before surgery. This is called neoadjuvant therapy. In some cases this makes it possible to use less radical surgery and remove less tissue.

Radiation therapy can also be used to relieve symptoms of more advanced cancer, such as pain, bleeding, trouble swallowing, and problems caused by bone metastases.

### **1.8.2.1 Side effects of radiotherapy**

Side effects during radiotherapy usually disappear gradually over a few weeks or months after treatment finishes. It's common to have a skin reaction in the area of your face and neck being treated. The skin can become sore, red and may peel or become blistered. This usually starts about 2–3 weeks after treatment starts and may last for three or four weeks after treatment ends.

- Radiation of the mouth and throat area can cause several short-term side effects, including:
- Skin changes like a sunburn or suntan on the head and neck that slowly fades away
- Hoarseness
- Loss of sense of taste
- Redness and soreness or even pain in the mouth and throat

### **1.8.3 Chemotherapy for oral cavity and oropharyngeal cancer**

Chemotherapy (chemo) is the use of anti-cancer drugs to treat cancer. For oral cavity and oropharyngeal cancers, the drugs are given into a vein or taken by mouth, which allows them to enter the bloodstream and reach cancer that has spread to organs beyond the head and neck. It may be used in several different situations:

Chemo (typically combined with radiation therapy) may be used instead of surgery as the main treatment for some cancers.

Chemo (combined with radiation therapy) may be given after surgery to try to kill any small deposits of cancer cells that may have been left behind. This is known as adjuvant chemotherapy.



Chemo (sometimes with radiation) may be used to try to shrink some larger cancers before surgery. This is called neoadjuvant or induction chemotherapy. In some cases this makes it possible to use less radical surgery and remove less tissue. This can lead to fewer serious side effects from surgery (Khan Z., 2012).

Chemo (with or without radiation) can be used to treat cancers that are too large or have spread too far to be removed by surgery. The goal is to slow the growth of the cancer for as long as possible and to help relieve any symptoms the cancer is causing.

The chemo drugs used most often for cancers of the oral cavity and oropharynx are:

- Cisplatin
- Carboplatin
- 5-fluorouracil (5-FU)
- Paclitaxel (Taxol®)
- Docetaxel (Taxotere®)
- Other drugs that are used less often include
- Methotrexate
- Ifosfamide (Ifex®)
- Bleomycin

A chemo drug may be used alone or combined with other drugs. Combining drugs can often shrink tumors more effectively, but will likely cause more side effects. A commonly used combination is cisplatin and 5-FU. This combination is more effective than either drug alone in shrinking cancers of the oral cavity and oropharynx. Another combination often used is cisplatin, 5-FU, plus docetaxel. Doctors give chemotherapy in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Each chemotherapy cycle typically lasts for a few weeks.

For cancers of the head and neck (such as oral cavity and oropharyngeal cancers) chemo is often given at the same time as radiation (known as chemoradiation). Cisplatin alone is usually the preferred chemo drug when given along with radiation. Some doctors prefer to give the radiation and chemo before surgery. However, the side effects can be severe and may be too much for some patients.

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In patients whose cancers are too advanced for surgery but not widespread, chemo and radiation given together might produce a better outcome than radiation alone. But this combined approach can be hard to tolerate, especially for people in poor health.

### **1.8.3.1 Possible side effects of chemotherapy**

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow, the lining of the mouth and intestines, and the hair follicles are also affected. This can lead to some side effects.

The side effects of chemo depend on the type and dose of drugs given and how long they are taken. These side effects can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea
- Low blood counts

### **1.8.4 Targeted therapy for oral cavity and oropharyngeal cancer**

As researchers have learned more about the changes in cells that cause cancer, they have developed newer drugs that specifically target these changes. Targeted drugs work differently from standard chemotherapy (chemo) drugs. They often have different (and less severe) side effects.

Cetuximab (Erbix®) is a monoclonal antibody (a man-made version of an immune system protein) that targets epidermal growth factor receptor (EGFR), a protein on the surface of certain cells that helps them grow and divide. Oral cavity and oropharyngeal cancer cells often have more than normal amounts of EGFR. By blocking EGFR,

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cetuximab can slow or stop cell growth. Cetuximab may be combined with radiation therapy for some earlier stage cancers. For more advanced cancers, it may be combined with standard chemo drugs such as cisplatin, or it may be used by itself.

Cetuximab is given by infusion into a vein (IV), usually once a week. A rare but serious side effect of cetuximab is an allergic reaction during the first infusion, which could cause problems with breathing and low blood pressure. Many people develop skin problems such as an acne-like rash on the face and chest during treatment, which in some cases can lead to infections. Other side effects may include headache, tiredness, fever, and diarrhea.

### **1.8.5 Palliative treatment for oral cavity and oropharyngeal cancer**

Most of this document discusses ways to remove or to destroy cancer cells or to slow their growth. But maintaining a patient's quality of life is another important goal of treatment. This is true for people being treated to try to cure the cancer and for people whose cancer is too advanced to be cured. If the goal of treatment is a cure, palliative treatments can help ease symptoms from the cancer treatment itself. If the cancer is advanced, palliative treatment may play an even larger role, helping to keep the person comfortable and maintain quality of life for as long as possible.

Pain is a significant concern for many patients with cancer. It can almost always be treated effectively with milder drugs like ibuprofen or acetaminophen or, if needed, with stronger medicines like morphine or similar drugs (known as opioids). Taking these drugs does not mean a person will become addicted. Many studies have shown that people with cancer who take opioids for pain as their doctor directed typically do not become addicted.

Nutrition is another important concern for people with head and neck cancers such as oral cavity or oropharyngeal cancers. Both the cancer and its treatment may make it hard to swallow. If this affects how a person eats or drinks, they may need to have a feeding tube placed (this was discussed in "Surgery for oral and oropharyngeal cancer"). This tube

will most likely be needed for a short time during treatment, but in some cases it may need to be left in longer (Cancer.org, 2016).

### **Aims and objectives of the study**

The present study was designed to assess:

- The understanding of oropharyngeal cancer among Bangladeshi people.
- The prevalence of oropharyngeal cancer.
- The relationship between the life style risk factors and oropharyngeal cancer.

## **Significance of the study**

Cancer of the oral cavity is one of the common malignancies in developing countries. It is common in males compared to females and is usually seen after middle age. The incidence of oral cancer is increasing, however, in the younger generation in recent years. Over the years, the incidence of oral cancers in the population has increased manifold especially among the younger generation, possibly related to the rising trend of pan and gutkha chewing, smoking and alcohol consumption. Smokeless tobacco use has also been implicated for the etiology of oral pre-cancerous and cancerous lesions. Etiology of oral and oropharyngeal malignancy is multifactorial, but the commonest etiological factors found are tobacco and alcohol consumption.

In this study, we have studied the distribution of oral cavity and oropharyngeal malignancies in relation to age, sex, site, personal habits, histological type and differentiation. Tobacco consumption in the form of smoking and smokeless tobacco was the common etiological factor noticed. Anatomically, more anterior parts in the oral cavity are the common sites involved. Squamous cell carcinoma was the most common histological type, with the majority of them being well differentiated.

In the developing countries oropharyngeal cancer is a great concern for the people living there. Oral health is very important part of human health. Poor oral health often factors of oral cancer. Oral cancer is very alarming disease that affects many people each year all over the world. It is the eleventh most dominate cancer in the world. Our study on mass people of different shopping mall and tea stall beside the roads to know the current prevalence and risk factors for oral carcinoma and to evaluate the awareness and knowledge of Bangladeshi people regarding oral and pharyngeal cancer and to identify how many people are concern about the impact of smoking and drinking alcohol regarding oropharyngeal cancer. From the study we have come to know that mass people have little knowledge about the oropharyngeal cancer. And through this study the society will know the current status of prevalence of oropharyngeal cancer.

From this study we have got some vital evidence about oropharyngeal cancers from a developing country like Bangladesh that a clear scenario may be obtain about the factors

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those are responsible for oropharyngeal cancer and its magnitude of impact over the people. We also come to know about the thought of the people about oropharyngeal cancers, its treatment procedure, diet, its vaccination, preventive ways and also the awareness of the people that helps us to study more or to find new things based on this study information.

# Chapter-2

## Literature Review



## **2.1 Oral cavity and oropharyngeal squamous cell carcinoma in young adults: a review of the literature**

Head and neck squamous cell carcinoma (HNSCC) is a disease of middle-aged to elderly adults. However, an increased incidence of HNSCC in young people under 45 years of age has been reported recently. In the present review, we focused on the epidemiology and aetiology of HNSCC in adults under 45 years of age.

The reviewed literature related to HNSCC in adult patients less than 45 years of age and discussed current treatment options and prognosis.

HNSCC in young adults is associated with a higher incidence rate in nonsmokers, lower female-to-male ratio, a higher percentage of oral cavity and oropharynx tumours, and fewer second primary tumours. However, aside from traditional risk factors of tobacco and alcohol exposure, the causes of these cancers in young adults remain unclear. Agents that might contribute to risk include infection with high-risk human papillomavirus subtypes as well as genetic factors or immunodeficiency status. The expected increase in incidence and mortality of the young with HNSCC may become a major public health concern if current trends persist, particularly lifestyle habits that may contribute to this disease.

Given the younger age and potential long-term adverse sequelae of traditional HNSCC treatments, young adults should be treated on a case-by-case basis and post-therapy quality of life must be considered in any treatment-decision making process (Majchrzak *et al.*, 2014).

## **2.2 Oropharyngeal cancer: current understanding and management**

The goals of this article are: to briefly review oropharyngeal anatomy; to provide a review of the epidemiology of oropharyngeal cancer in the Western Hemisphere; to review the literature on the association of human papilloma virus with oropharyngeal cancer; to review the recent literature on evolving diagnostic techniques for

oropharyngeal cancer; and to summarize accepted management strategies for oropharyngeal cancer by subsite.

The incidence of oropharyngeal cancer may be increasing among younger age groups in the Western Hemisphere, and this may be related to an increased association with human papillomavirus 16. The implications of this viral association with regard to outcomes and management strategies remain under investigation. Screening with toluidine blue, autofluorescence, or both may be useful adjuncts to physical examination and panendoscopy in assessing potentially invasive or dysplastic lesions of the oropharynx. These techniques remain under study. MRI and PET scan are proving to be useful techniques for assessing local extension, regional metastases, and recurrences of squamous cell carcinoma (SCC) of the oropharynx in selected cases. However, serial computed tomography scanning remains the imaging modality of choice in the United States. Early SCCs of the oropharynx (T1-2), in general, may be managed effectively with either surgery or primary irradiation, though, with either technique, clinicians must have a management plan for the neck. Advanced SCCs of the oropharynx (T3-4, nodally aggressive, or both) require multimodal approaches consisting of either surgery along with adjuvant irradiation or concurrent chemoradiation along with salvage surgery (as necessary).

Management of SCC of the oropharynx is in a period of transition because of evolving changes in our understanding of the oncogenic process; evolving diagnostic techniques; and evolving combinations of therapies, both surgical and nonsurgical. For the time being, we propose using local subsite and disease stage to guide therapeutic decision-making (Cohan DM *et al*, 2016).

### **2.3 Relation of lymph-node metastasis to histopathologic appearance in oral cavity and oropharyngeal carcinoma: A case series and literature review**

A number of histopathologic parameters in squamous cell carcinoma of the oral cavity and oropharynx have been identified as having a statistically significant correlation with regional lymph-node metastasis. These parameters have been inconsistent and not readily

reproducible. In an attempt to confirm these parameters, a retrospective analysis of 22 patients with T1 to T4 squamous cell carcinoma of the oral cavity and oropharynx was performed. Initially, these patients were managed with either wide local excision or surgical excision of the primary tumor combined with radical neck dissection. There was a minimum of 3 years of follow-up.

Chi-square contingency tables and Fisher's Exact Test were used to correlate histopathologic parameters with lymph-node metastasis. Statistically significant correlations were found for tumor thickness and inflammatory infiltrate (Rasgon et al., 1989).

#### **2.4 Oral cavity and oropharyngeal cancer in a younger population. Review of literature and experience at Yale**

Oral cavity and oropharyngeal cancer in younger adults is a rare entity with an incidence of 2.7% among 1014 patients seen or treated at the Department of Therapeutic Radiology, Yale-New Haven Medical Center between 1958 and 1980. Although there are reports of contrastingly divergent therapeutic experiences, the authors contend that even early stage cancers frequently fail definitive therapy with a rampant course, causing a rapidly fatal outcome. The three-year actuarial survival was a mere 17% at Yale. The authors speculate that younger adult oral cavity and oropharyngeal cancers are possibly related to a genetic disorder or immunodeficiency, and recommend aggressive surgical and radiotherapeutic approaches combined with possible adjuvant immunotherapy (Son and Kapp, 1985).

#### **2.5 Risk factors for squamous cell carcinoma of the oral cavity in young people—a comprehensive literature review**

There have been several reports of a rising incidence of oral cancer from many parts of the world. Although it is well known that oral cancer increases with age, recent trends for a rising incidence particularly relates to cancer of the tongue and mouth in young males.

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This review critically examines 46 publications devoted to oral cancer in the young adult. Most studies suggest that 4–6% of oral cancers now occur at ages younger than 40 years. Several studies examining risk factors for oral cancer in the young provide evidence that many younger patients have never smoked or consumed alcohol, which are recognized risk factors in older groups, or that duration of exposure may be too short for malignant transformation to occur. Information on many aspects of etiology for this disease in the young implicating occupational, familial risk, immune deficits and virus infection are meager. The spectrum of genetic abnormality disclosed is similar to older patients, there is paucity of specific studies involving younger cohorts, but predisposition to genetic instability has been hypothesized as a likely cause. Conflicting evidence is also reported on the sex distribution and outcome compared with older patients. Much work is required to understand the caveats related to global demography, risk factors and their diagnostic and prognostic markers for this disease which might be considered a disease distinct from that occurring in older patients (Llewellyn *et al*, 2001).

## **2.6 Cases–Control Study of Human Papillomavirus and Oropharyngeal Cancer**

Substantial molecular evidence suggests a role for human papillomavirus (HPV) in the pathogenesis of oropharyngeal squamous-cell carcinoma, but epidemiologic data have been inconsistent. We performed a hospital-based, case–control study of 100 patients with newly diagnosed oropharyngeal cancer and 200 control patients without cancer to evaluate associations between HPV infection and oropharyngeal cancer. Multivariate logistic-regression models were used for case–control comparisons. A high lifetime number of vaginal-sex partners (26 or more) was associated with oropharyngeal cancer (odds ratio, 3.1; 95% confidence interval [CI], 1.5 to 6.5), as was a high lifetime number of oral-sex partners (6 or more) (odds ratio, 3.4; 95% CI, 1.3 to 8.8). The degree of association increased with the number of vaginal-sex and oral-sex partners (P values for trend, 0.002 and 0.009, respectively). Oropharyngeal cancer was significantly associated with oral HPV type 16 (HPV-16) infection (odds ratio, 14.6; 95% CI, 6.3 to 36.6), oral infection with any of 37 types of HPV (odds ratio, 12.3; 95% CI, 5.4 to 26.4), and seropositivity for the HPV-16 L1 capsid protein (odds ratio, 32.2; 95% CI, 14.6 to 71.3).

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HPV-16 DNA was detected in 72% (95% CI, 62 to 81) of 100 paraffin-embedded tumor specimens, and 64% of patients with cancer were seropositive for the HPV-16 oncoprotein E6, E7, or both. HPV-16 L1 seropositivity was highly associated with oropharyngeal cancer among subjects with a history of heavy tobacco and alcohol use (odds ratio, 19.4; 95% CI, 3.3 to 113.9) and among those without such a history (odds ratio, 33.6; 95% CI, 13.3 to 84.8). The association was similarly increased among subjects with oral HPV-16 infection, regardless of their tobacco and alcohol use. By contrast, tobacco and alcohol use increased the association with oropharyngeal cancer primarily among subjects without exposure to HPV-16. Oral HPV infection is strongly associated with oropharyngeal cancer among subjects with or without the established risk factors of tobacco and alcohol use (New England Journal of Medicine, 2016).

## **2.7 Human Papillomavirus and Survival of Patients with Oropharyngeal Cancer**

Oropharyngeal squamous-cell carcinomas caused by human papillomavirus (HPV) are associated with favorable survival, but the independent prognostic significance of tumor HPV status remains unknown.

We performed a retrospective analysis of the association between tumor HPV status and survival among patients with stage III or IV oropharyngeal squamous-cell carcinoma who were enrolled in a randomized trial comparing accelerated-fractionation radiotherapy (with acceleration by means of concomitant boost radiotherapy) with standard-fractionation radiotherapy, each combined with cisplatin therapy, in patients with squamous-cell carcinoma of the head and neck. Proportional-hazards models were used to compare the risk of death among patients with HPV-positive cancer and those with HPV-negative cancer.

The median follow-up period was 4.8 years. The 3-year rate of overall survival was similar in the group receiving accelerated-fractionation radiotherapy and the group receiving standard-fractionation radiotherapy (70.3% vs. 64.3%;  $P=0.18$ ; hazard ratio for death with accelerated-fractionation radiotherapy, 0.90; 95% confidence interval [CI], 0.72 to 1.13), as were the rates of high-grade acute and late toxic events. A total of 63.8%

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of patients with oropharyngeal cancer (206 of 323) had HPV-positive tumors; these patients had better 3-year rates of overall survival (82.4%, vs. 57.1% among patients with HPV-negative tumors;  $P < 0.001$  by the log-rank test) and, after adjustment for age, race, tumor and nodal stage, tobacco exposure, and treatment assignment, had a 58% reduction in the risk of death (hazard ratio, 0.42; 95% CI, 0.27 to 0.66). The risk of death significantly increased with each additional pack-year of tobacco smoking. Using recursive-partitioning analysis, we classified our patients as having a low, intermediate, or high risk of death on the basis of four factors: HPV status, pack-years of tobacco smoking, tumor stage, and nodal stage. Tumor HPV status is a strong and independent prognostic factor for survival among patients with oropharyngeal cancer (New England Journal of Medicine, 2016).

## **2.8 Global epidemiology of oral and oropharyngeal cancer**

This review presents data on incidence, mortality, survival and trends in cancers of the lip, oral cavity and oropharynx using available recent data sources around the world. Oral and pharyngeal cancer, grouped together, is the sixth most common cancer in the world. The review focuses primarily on several high-risk countries in an attempt to gain insight into the geographic variations in the incidence of this cancer in the globe and to relate the high incidence in some populations to their life style. With an estimated half a million cases around the globe and the rising trends reported in some populations, particularly in the young, urgent public health measures are needed to reduce the incidence and mortality of oral and oropharyngeal cancer (Warnakulasuriya, 2009).

## **2.9 Quality of life of disease-free survivors of advanced (stage III or IV) oropharyngeal cancer**

This study assessed the quality of life (QOL) of patients with advanced oropharyngeal cancer (stage III or IV) who were disease-free at 1 year posttreatment. Between 1993 and

1994, 13 consecutive cases were identified from the University of Washington QOL registry.

Patients were divided into two groups, depending on treatment: surgical group, 6 patients treated with surgical resection and postoperative radiotherapy; and nonsurgical group, 7 patients treated with definitive radiotherapy.

Composite pretreatment and posttreatment QOL scores were similar for the two treatment groups. Subset analysis of QOL domains revealed that both treatment groups generally reported a worsening of chewing and swallowing. A worsening of appearance and of speech was more frequently reported by the surgical group. Sixty-seven percent of the surgically treated patients reported pain relief, as opposed to only 29% of the nonsurgical group.

Composite QOL-score sensitivity may be compromised by inverse changes in individual QOL domains. Treatment-specific QOL domains may be more sensitive measures of outcome (Deleyiannis *et al*, 1997)

### **2.10 Neck surgery in patients with primary oropharyngeal cancer treated by radiotherapy**

The role of neck surgery in node-positive patients whose primary tumors are treated by definitive radiotherapy is controversial. This analysis was undertaken to assess the risk of withholding planned neck dissection in patients who obtain a complete nodal response to irradiation.

It was reviewed the records of 100 patients who presented between 1984 and 1993 with oropharyngeal cancers metastatic to the neck and whose primary tumors were treated by radiotherapy using the concomitant boost regimen. Seventy-five patients had their nodal disease treated definitively by radiotherapy; those who had complete clinical resolution of all nodal disease (62) had no planned surgery, while 13 underwent neck dissection for presumed residual disease. The remaining 25 patients had either node excision (8) or neck dissection (17) prior to radiotherapy.

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There were 8 cases of isolated neck failure of which 3 occurred in the 62 patients who had no planned neck surgery, 0 in the 13 patients who had surgery for presumed residual (pathologically negative in 7), and 5 in the 25 patients who had initial neck surgery. In those who obtained a complete response to definitive radiotherapy, the risk of neck relapse was unrelated to pretreatment nodal size.

The policy of observation of the neck after complete nodal response to full-dose irradiation is both safe and cost effective. Imaging to confirm the resolution of nodal disease is recommended (Peters et al., 1996)



# Chapter-3

## Methodology

### **3.1 Types of the study**

It was a Descriptive study. It was attempt to measure the understanding of oropharyngeal cancer among Bangladeshi people, the prevalence of oropharyngeal cancer and to establish the relationship between the life style risk factors and oropharyngeal cancer.

### **3.2 Place of Study**

The study was conducted in different shopping mall like Boshundhara City Shopping Complex, Fortune Shopping Mall, Confidence Shopping Center, Suvastu Nazar vally, Jomuna Future Park and Molla Tower and Different roadside tea stall in Rampura, Badda, Basundhara, Notun Bazar, Banasree, Bashabo of Dhaka city.

### **3.3 Study population**

In this study, Targeted population was general people aged between 20-40 years.

#### **3.3.1 Inclusion criteria of the cases**

- i) Smoker and tobacco user
- ii) Alcoholic
- iii) People aged between 20-40 years

#### **3.3.2 Exclusion criteria of the cases**

- i) People below 20 and above 40
- ii) Student of East West University

### **3.4 Sample Size**

Sample size of the study was 300.

### **3.5 Study Period**

The duration of the study was about seven months that started from December 2015 to June 2016.

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### **3.6 Data Analysis**

Data were registered using Microsoft Excel data 2010 entry. Control of data entry was secured through both programme appliances and manually. The prevalence rates of Oral and oropharyngeal cancer disorder and other aspects were analyzed by simple percentage.

# Chapter -4

## Results

### 4.1.1 Age distribution

Table 4.1: Age distribution of people

Age	Number	Percentage
20-25	45	15%
26-30	167	55%
31-35	65	22%
36-40	22	8%
41-45	1	0%
<b>Total= 300</b>		

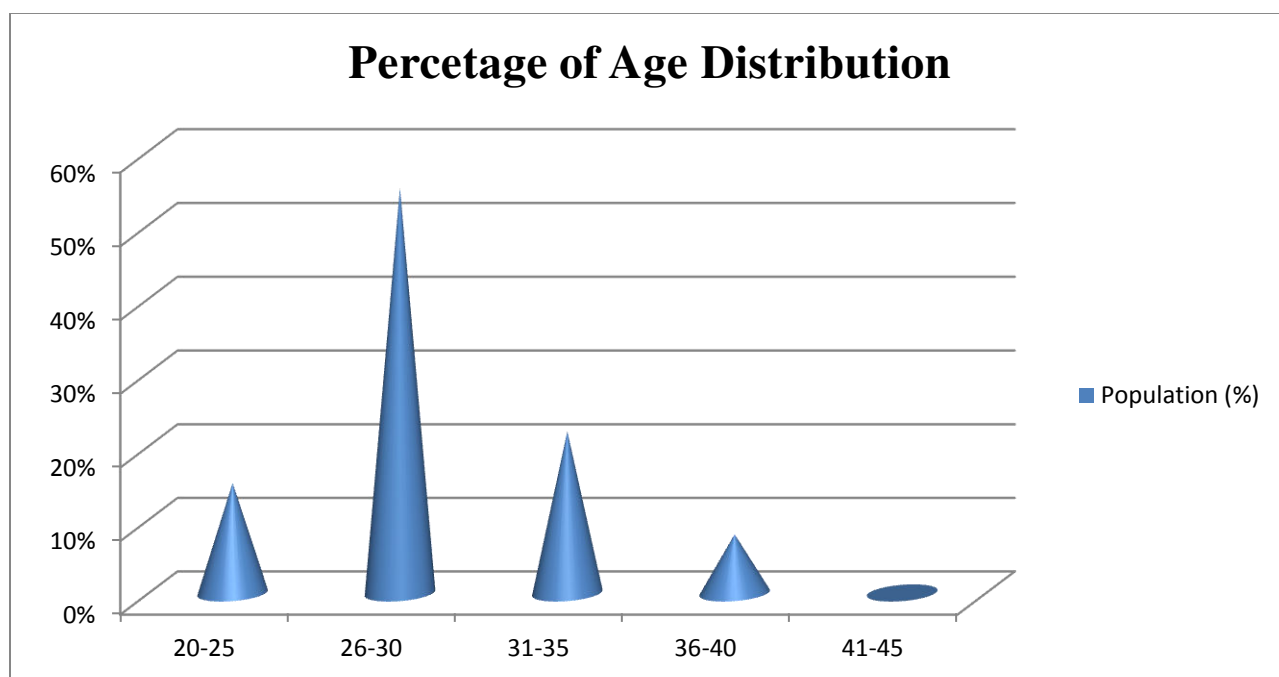


Figure 4.1: Percentage of Age Distribution

From this column chart we found that, the majority of the respondents are 26-30 years (55%) old people.

#### 4.1.2 Gender distribution

Table 4.2: Gender

Gender	Number	Percentage
Male	287	96%
Female	13	4%
<b>Total= 300</b>		

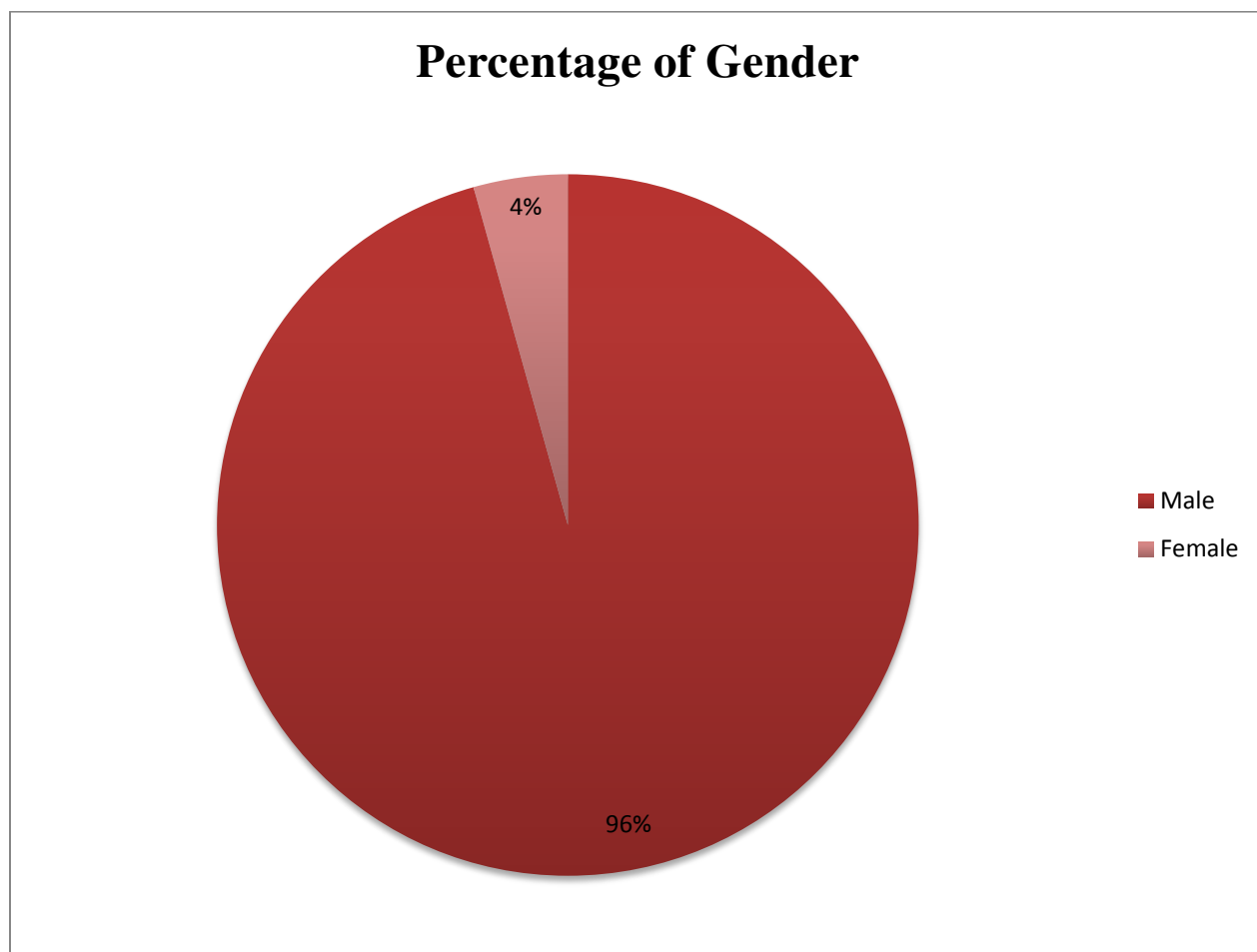


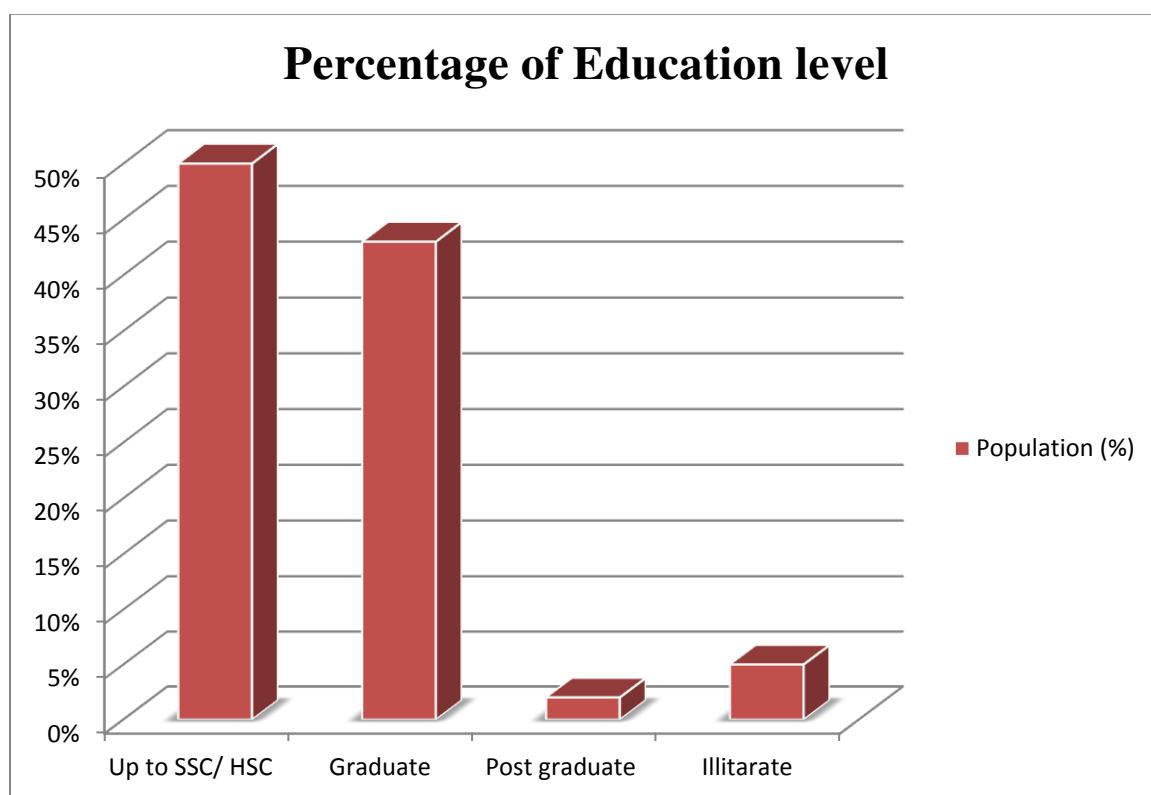
Figure 4.2: Percentage of Gender

From this pie chart we found that, the majority of the respondents are male (96%).

### 4.1.3 Education level

**Table 4.3: Age distribution of people**

Education level	Number	Percentage
Up to SSC/ HSC	151	50%
Graduate	129	43%
Post graduate	5	2%
Illiterate	15	5%
<b>Total= 300</b>		



**Figure 4.3: Age distribution of people**

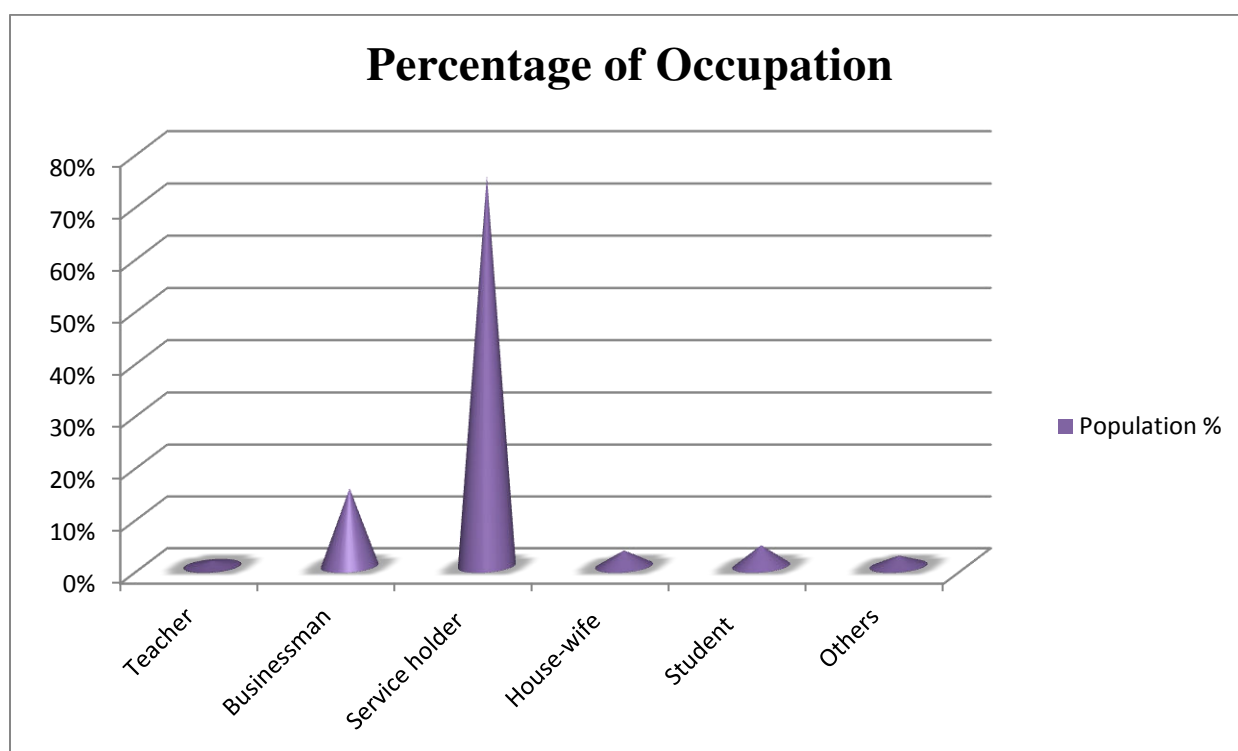
From this column chart we found that, the majority of the respondents have education level Up to SSC/HSC (50%).

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#### 4.1.4 Occupation

**Table 4.4: Occupation**

Occupation	Number	Percentage
Teacher	4	1%
Businessman	45	15%
Service holder	224	75%
House-wife	10	3%
Student	12	4%
Others	5	2%
<b>Total= 300</b>		



**Figure 4.4: Occupation**

From this column chart we found that, the majority of the respondents are service holders (75%)

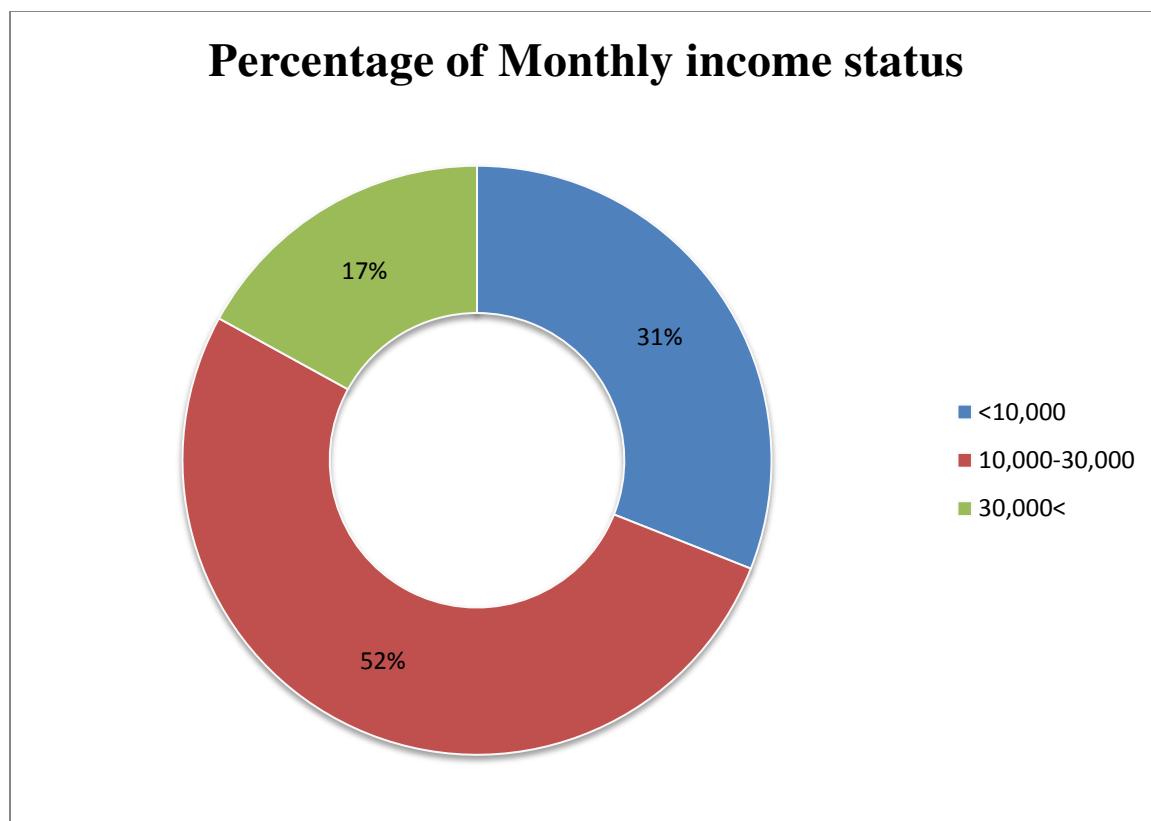
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#### 4.1.5 Monthly income status

**Table 4.5: Monthly income status**

Monthly Income	Number	Percentage
< 10,000	92	31%
10,000-30,000	158	52%
>30,000	50	17%
<b>Total= 300</b>		



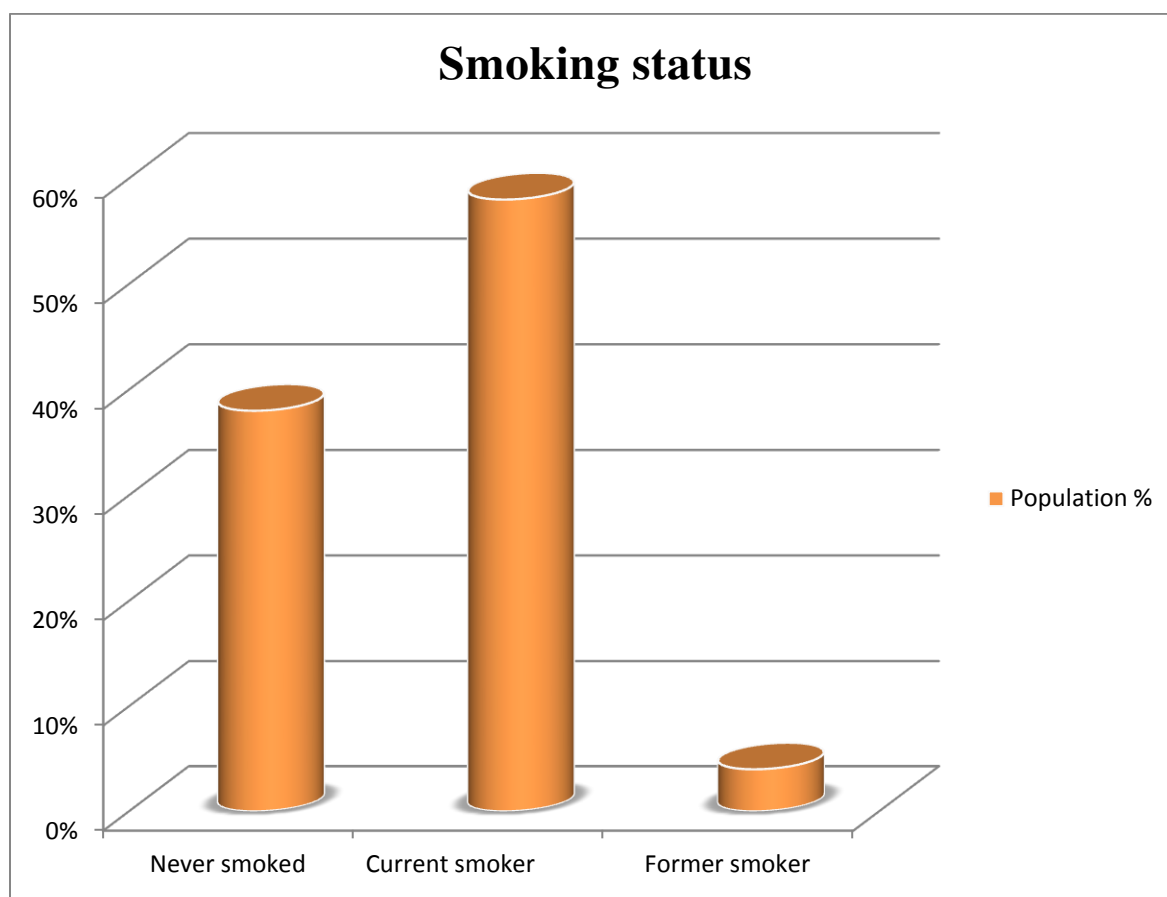
**Table 4.5: Monthly income status**

From this chart we found that, the majority of the respondents have monthly income around 10,000-30,000 (52%)

#### 4.1.6 Smoking status

**Table 4.6: Smoking status**

Smoking Status	Number	Percentage
Never smoked	114	38%
Current smoker	174	58%
Former smoker	12	4%
<b>Total= 300</b>		



**Figure 4.6: Smoking status**

From this column chart we found that, the majority of the respondents are current smokers (58%).

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#### 4.1.6.1 Smoking status of current smoker

**Table 4.7: Smoking status of current smoker**

Amount (per year)	Number	Percentage
10 pack	176	100%
Less than 10 pack	0	0%
<b>Total= 176</b>		

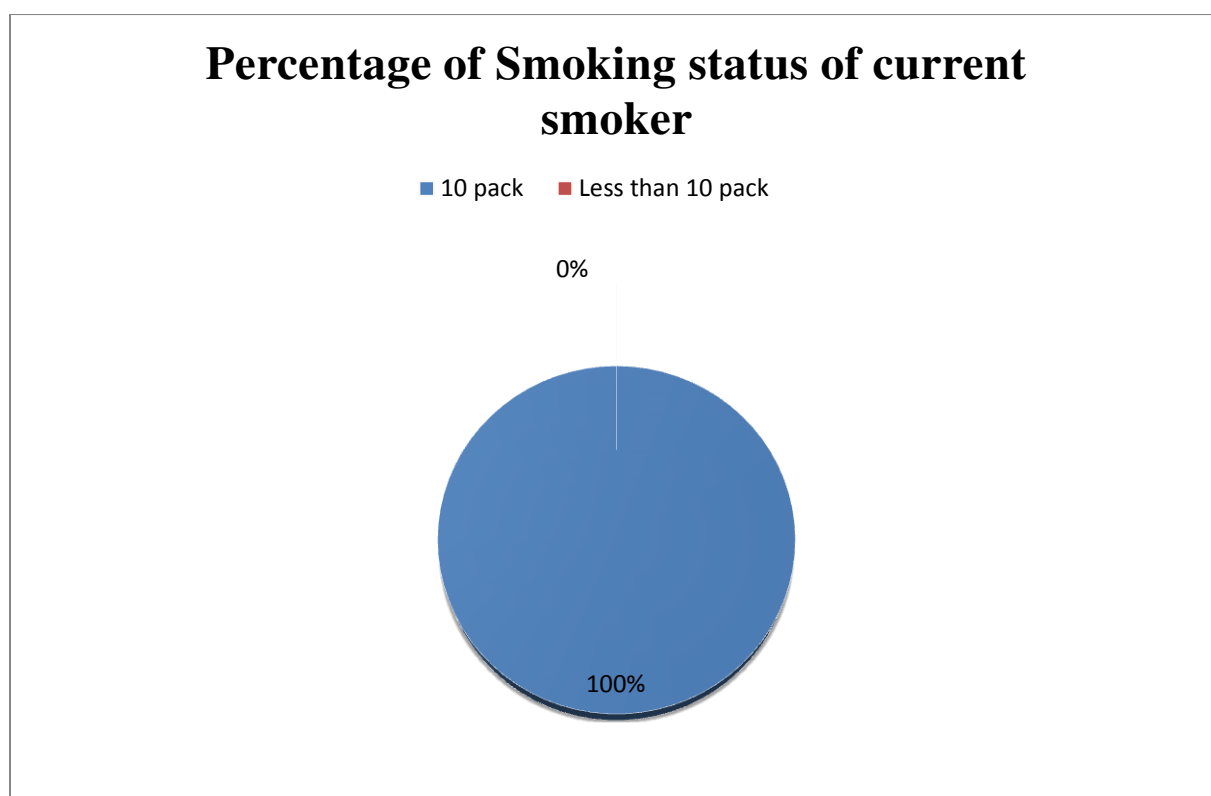


Figure 4.7: Percentage of Smoking status of current smoker

From this pie chart we found that, all of the current smoker take 10 pack per year (100%).

#### 4.1.6.2 Smoking history of former smoker

Table 4.8: Smoking history of former smoker

Smoking Stopped	Number	Percentage
6 months to a year ago	5	62%
1 to 2 years ago	3	38%
<b>Total= 8</b>		

Table 4.8: Smoking history of former smoker

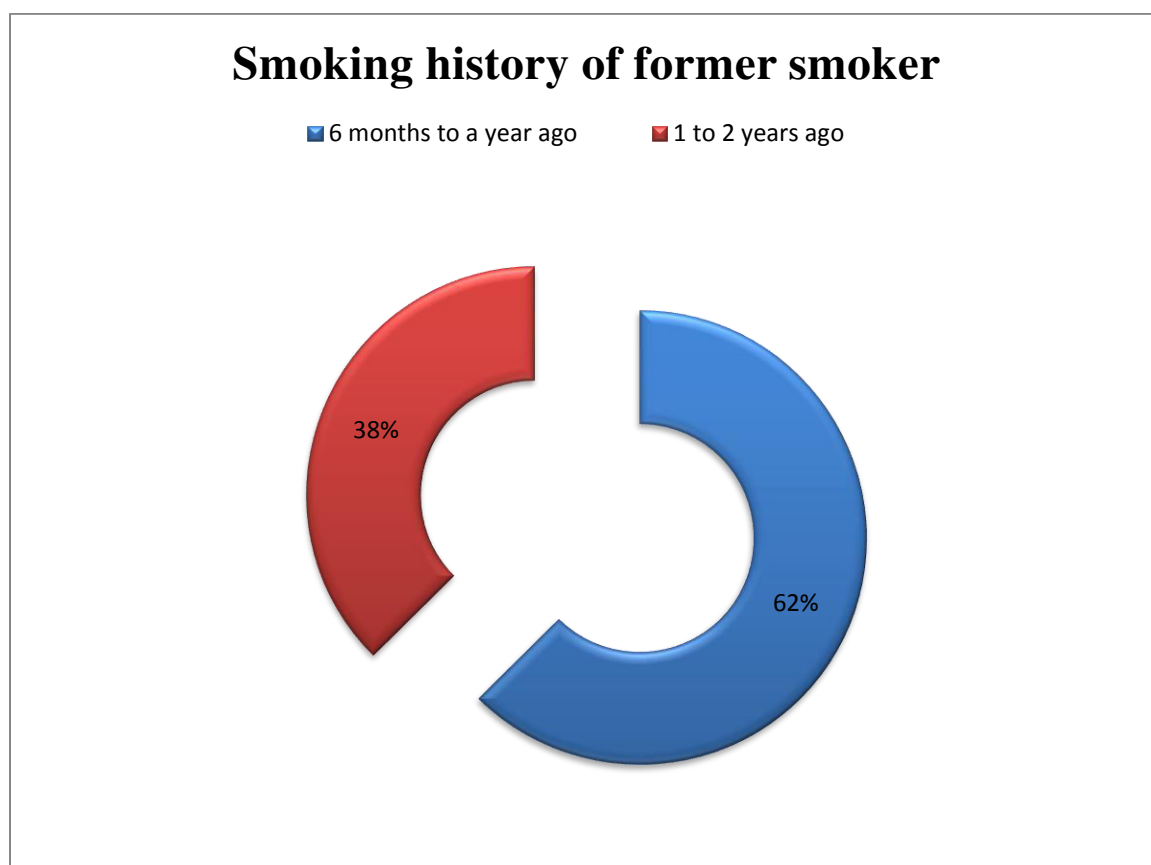


Figure 4.8: Smoking history of former smoker

From this chart we found that, the majority of the smoker stopped smoking 6 months to 1 year ago (62%).

#### 4.1.7 Habits of drinking alcohol

Table 4.9: Habits of drinking alcohol

Habits of drinking alcohol	Number	Percentage
Heavy alcohol	8	3%
Light alcohol	48	16%
Never take	244	81%
<b>Total= 300</b>		

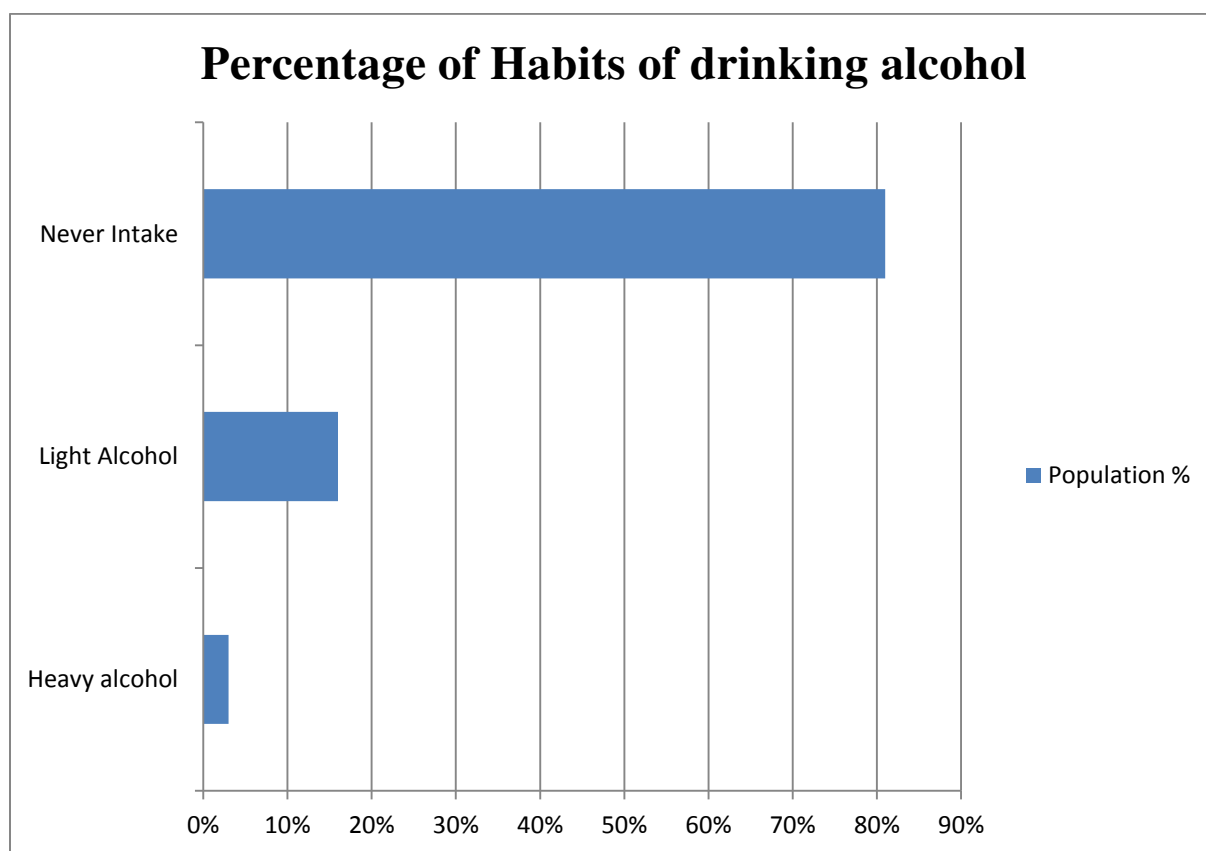


Figure 4.9: Habits of drinking alcohol

From this bar chart we found that, the majority of the people never intake any heavy alcohol (81%).

#### 4.1.8 Use of mouthwash

Table 4.10: Use of mouthwash

Use of mouthwash	Number	Percentage
Yes	41	14%
No	168	56%
Often	91	30%
<b>Total= 300</b>		

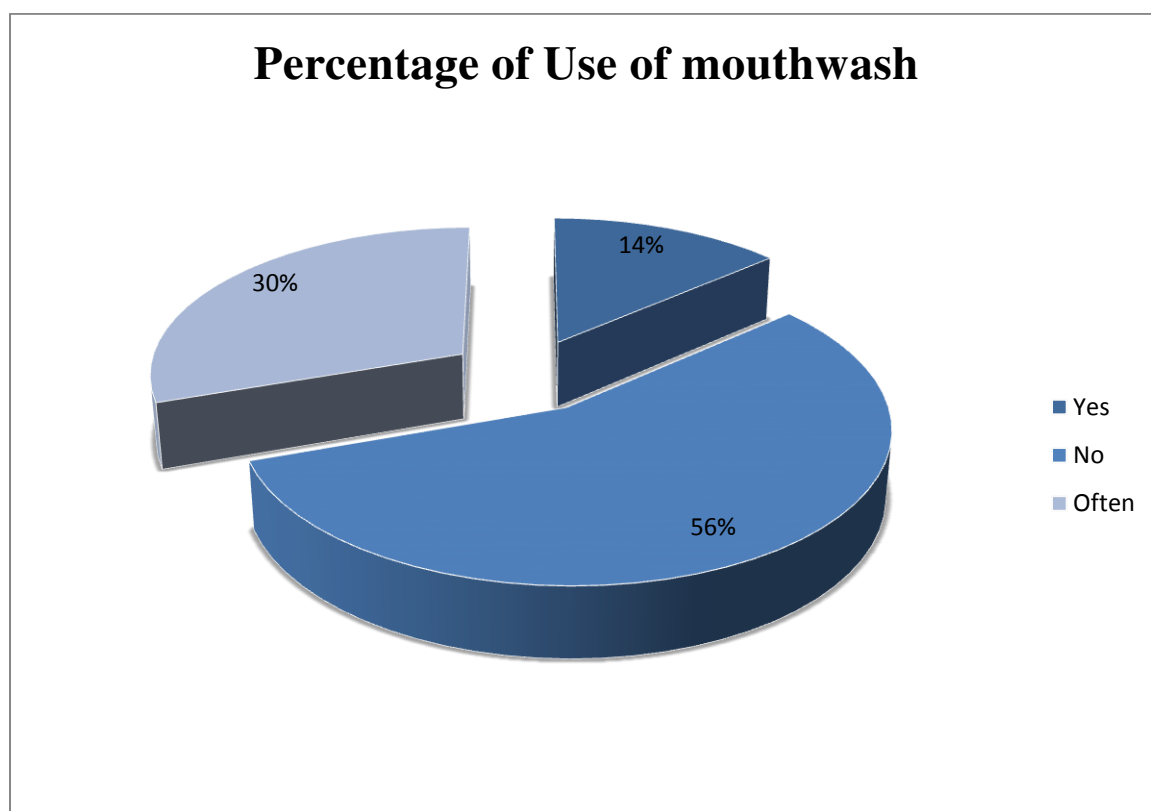


Figure 4.10: Use of mouthwash

From this pie chart we found that, the majority of the respondents do not use mouthwash (56%).

#### 4.1.8.1 Frequency of using Mouthwash per day

Table 4.11: Frequency of using Mouthwash per day

Frequency of using Mouthwash per day	Number	Percentage
Once daily	30	71%
Twice daily	12	21%
More than twice daily	0	0%
<b>Total= 42</b>		

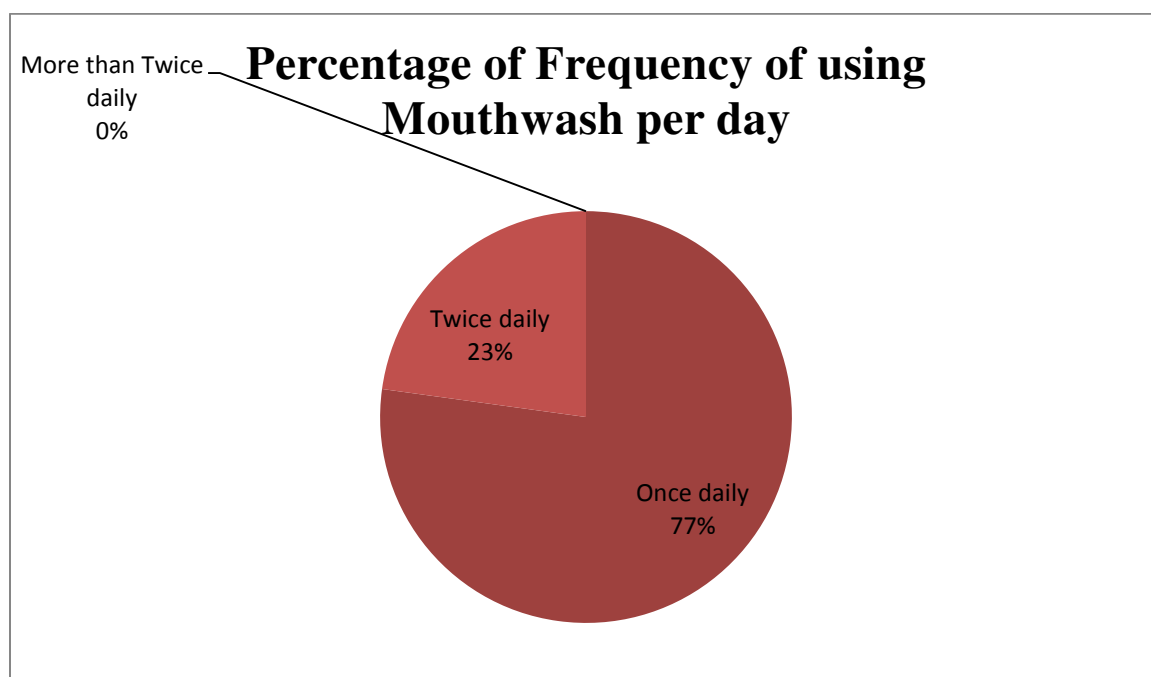


Figure 4.11: Frequency of using Mouthwash per day

From this chart we found that, the majority of the respondents use mouthwash once daily (71%).

#### 4.1.9 Knowledge on alcohol content in mouthwash

Table 4.12: Knowledge on alcohol content in mouthwash

mouthwashes contains high alcohols	Number	Percentage
Yes	15	5%
No	285	95%
<b>Total= 300</b>		

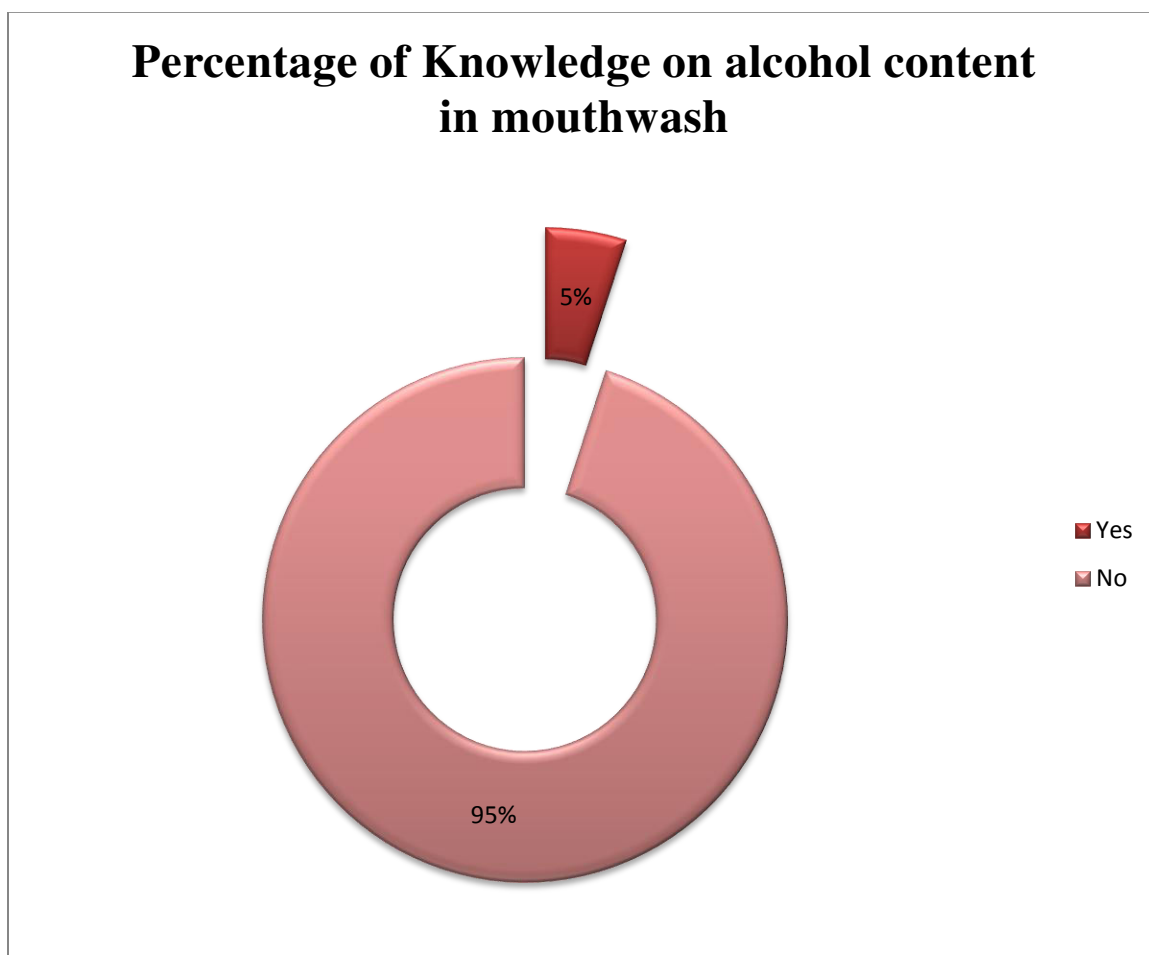


Figure 4.12: Knowledge on alcohol content in mouthwash

From this pie chart we found that, the majority of the respondents do not know that mouthwash contains heavy alcohol (95%).

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#### 4.1.10 Consult with dentist due to lump thickening inside the mouth

Table 4.13: Consult with dentist due to lump thickening inside the mouth

Consult a doctor	Number	Percentage
Yes	4	1%
No	272	91%
Never	24	8%
<b>Total= 300</b>		

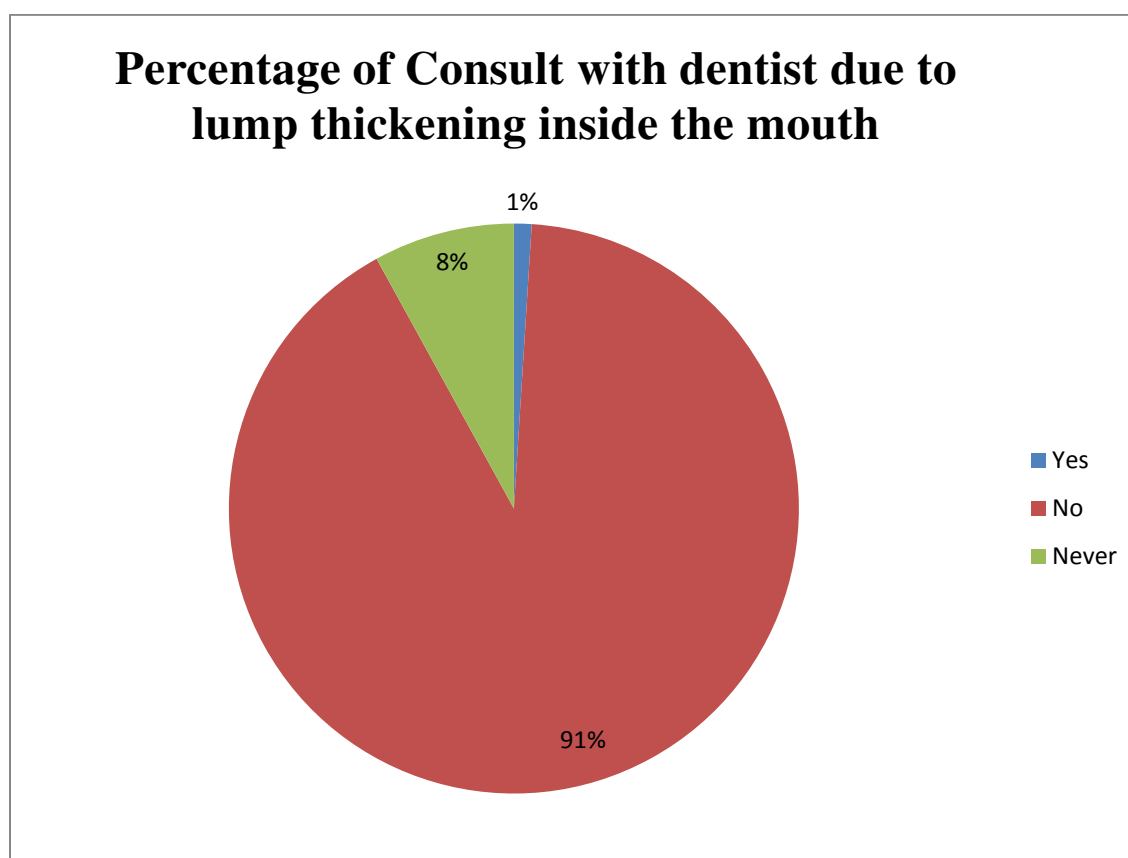


Figure 4.13: Consult with dentist due to lump thickening inside the mouth

From this chart we found that, the majority of the respondents do not (91%) consult a Doctor if ever felt a lump or thickening inside the mouth.

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#### 4.1.11 Consult with dentist due to painful mouth sore

Table 4.14: Consult with dentist due to painful mouth sore

Consult a doctor	Number	Percentage
Yes	9	3%
No	291	97%
<b>Total= 300</b>		

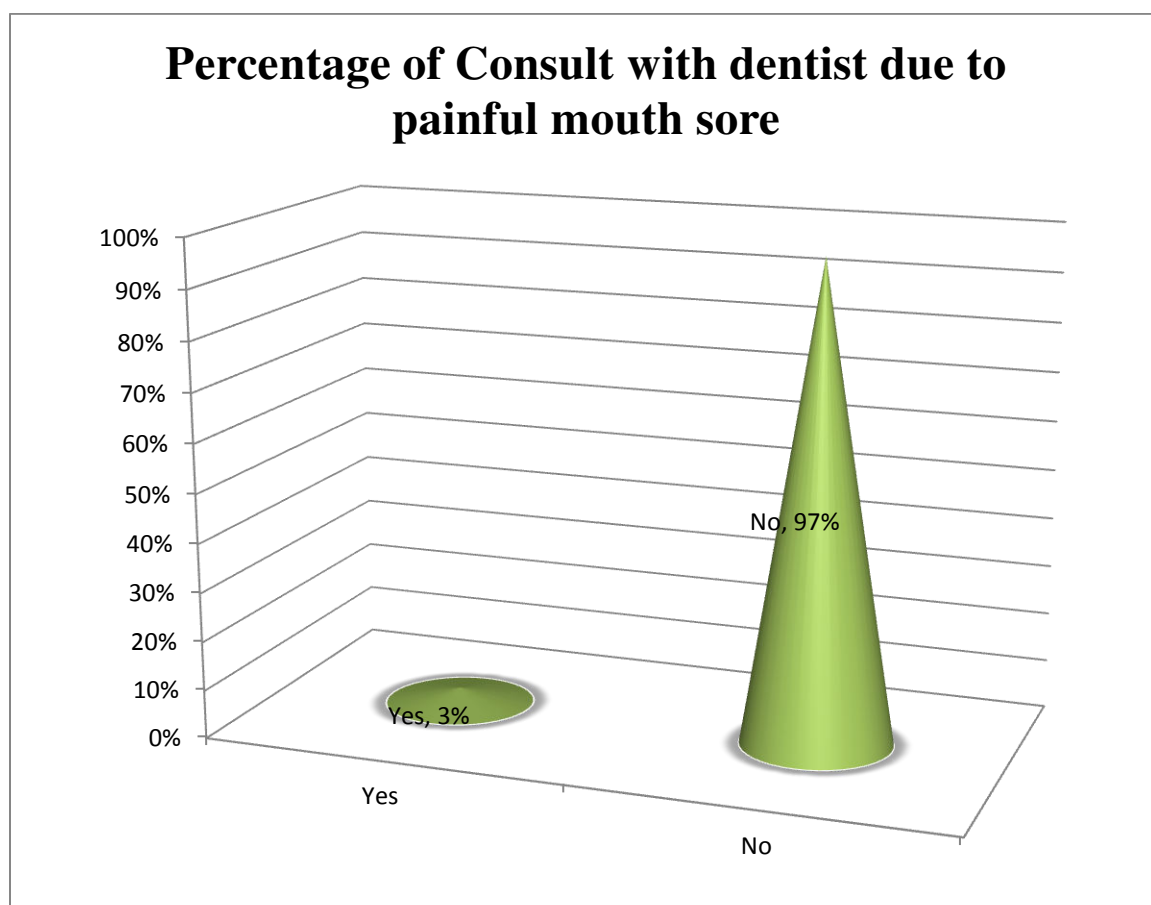


Figure 4.14: Consult with dentist due to painful mouth sore

From this chart we found that, the majority of the respondents do not (97 %) consult a Doctor if ever felt a painful mouth sore that doesn't heal.

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#### 4.1.12 Feeling of Pain or difficulty swallowing or chewing

Table 4.15: Consult with dentist due to painful mouth sore

Pain or difficulty swallowing or chewing	Number	Percentage
Yes	143	48%
No	142	47%
May be	15	5%
<b>Total= 300</b>		

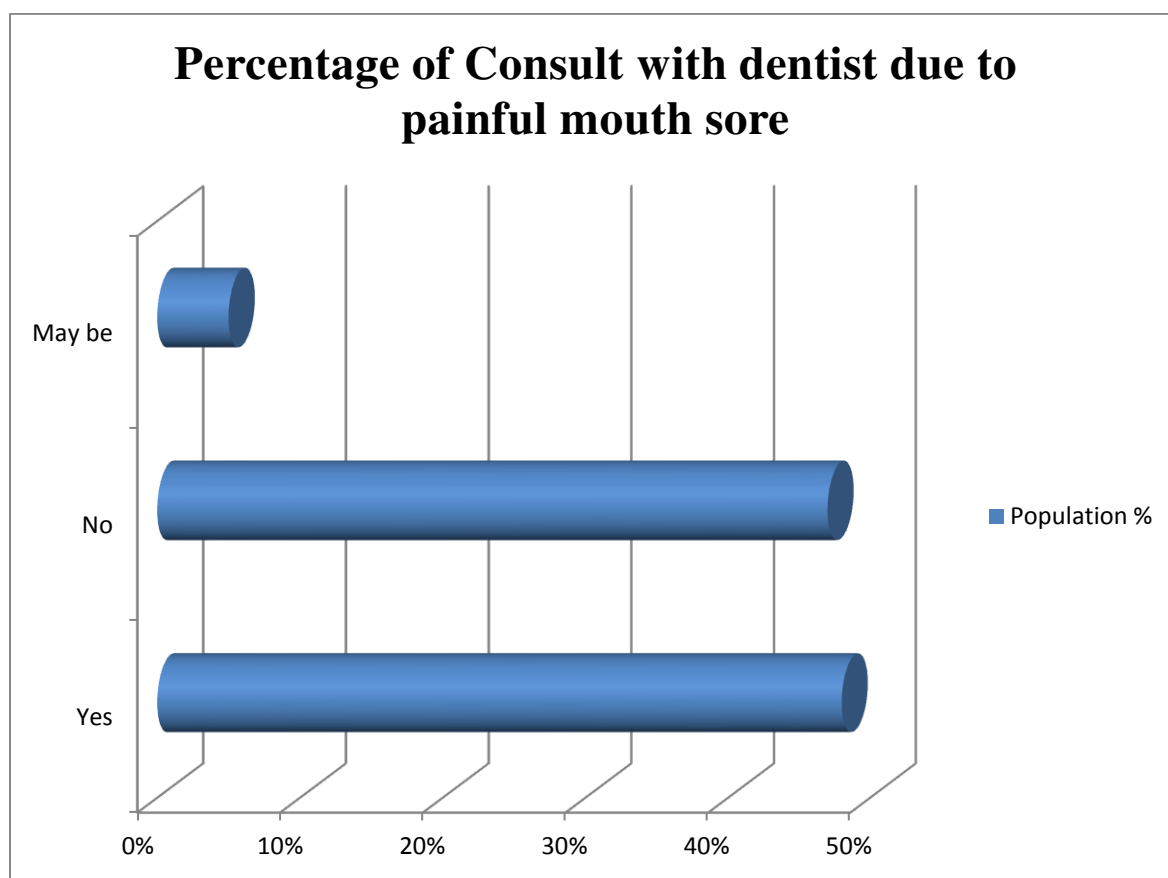


Figure 4.15: Consult with dentist due to painful mouth sore

From this chart we found that, the majority of the respondents (48 %) feel Pain or difficulty swallowing or chewing and difficulty in moving the jaw or tongue.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.1.12.1 Consult a Doctor if ever pain or difficulty swallowing or chewing

Table 4.16: Consult a Doctor if ever pain or difficulty swallowing or chewing

Consult a doctor	Number	Percentage
Yes	43	30%
No	99	70%
<b>Total= 142</b>		

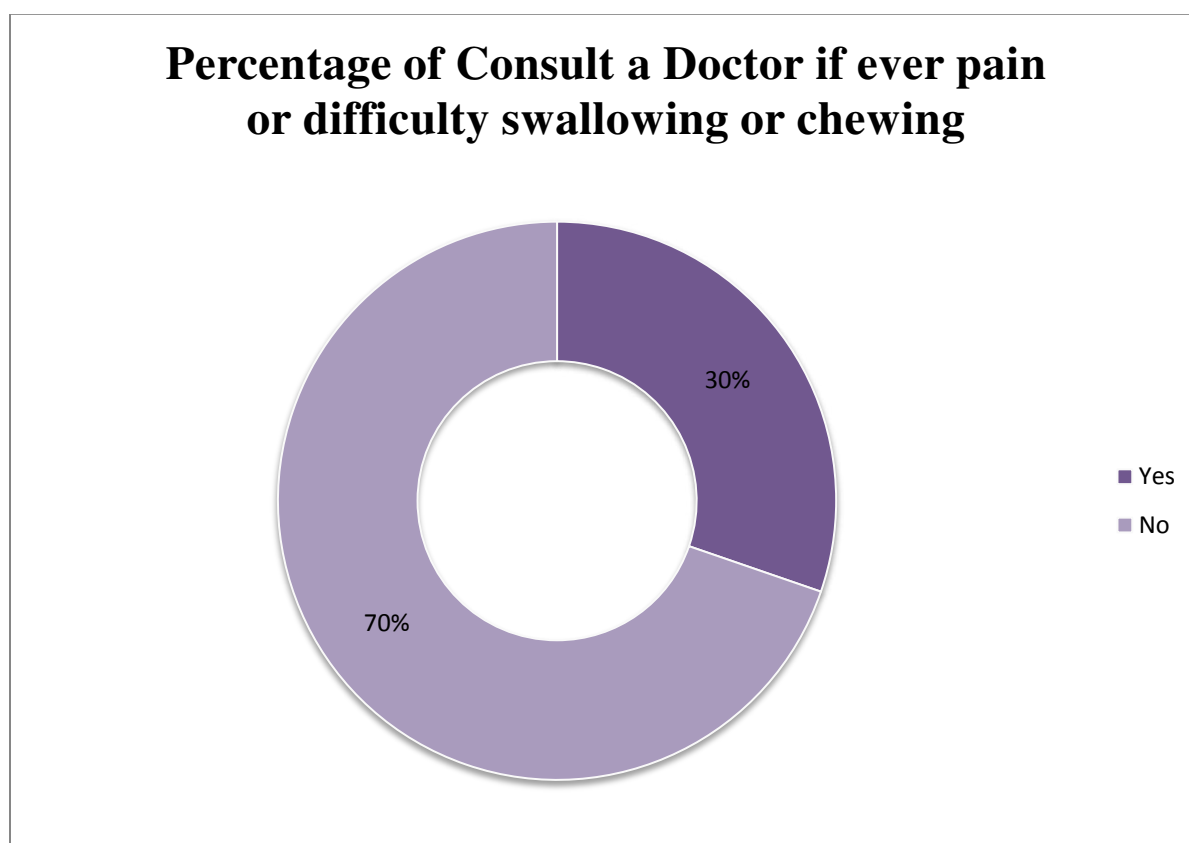


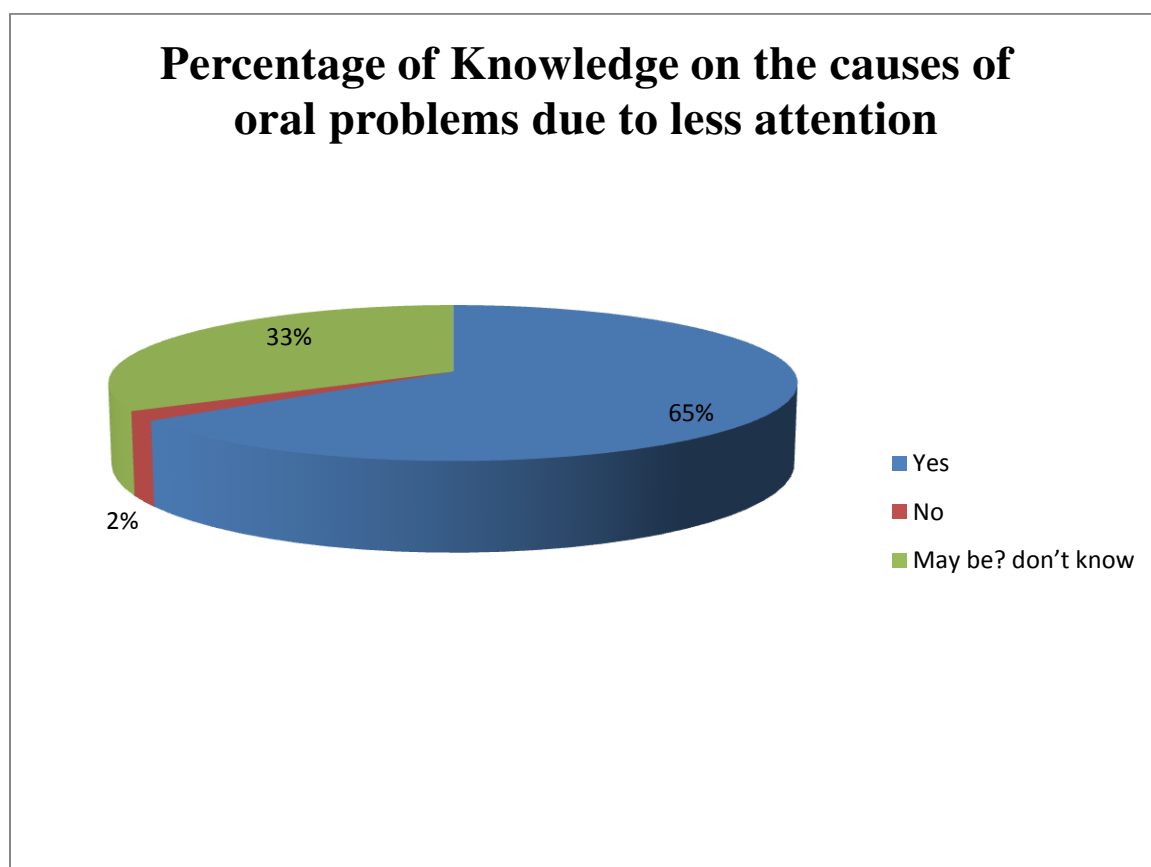
Figure 4.16: Consult a Doctor if ever pain or difficulty swallowing or chewing

From this chart we found that, the majority of the respondents (70 %) consult a Doctor if ever Pain or difficulty swallowing or chewing and difficulty in moving the jaw or tongue.

#### 4.1.13 Knowledge on the causes of oral problems due to less attention

Table 4.17: Knowledge on the causes of oral problems due to less attention

Knowledge on the causes of oral problems due to less attention	Number	Percentage
Yes	194	65%
No	5	2%
May be	101	33%
<b>Total= 300</b>		



**Figure 4.17: Knowledge on the causes of oral problems due to less attention**

From this chart we found that, the majority of the respondents (65 %) face problem due to less attention on dental health due to of people filling up the questionnaire.

#### 4.1.14 Regular checking up with a dentist

Table 4.18: Regular checking up with a dentist

Regular checking up with a dentist	Number	Percentage
Yes	61	20%
No	231	80%
<b>Total= 300</b>		

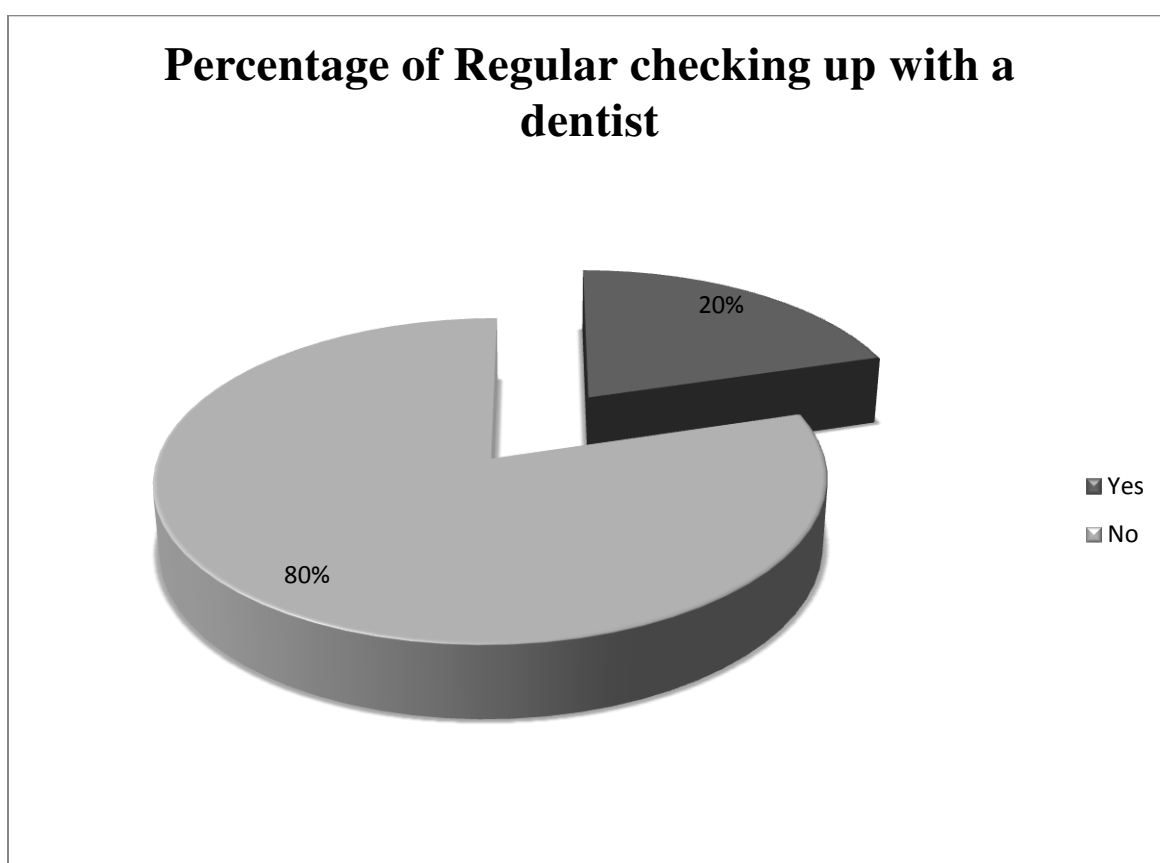


Figure 4.18: Regular checking up with a dentist

From this chart we found that, the majority of the respondents (80 %) do not consult with a dentist to check up oral health.

#### 4.1.15 Last visit to the Dentist

Table 4.19: Last visit to the Dentist

Last visit to the Dentist	Number	Percentage
Within the past year	6	6%
1 to 2 years ago	64	62%
More than 2 years ago	33	32%
<b>Total= 133</b>		

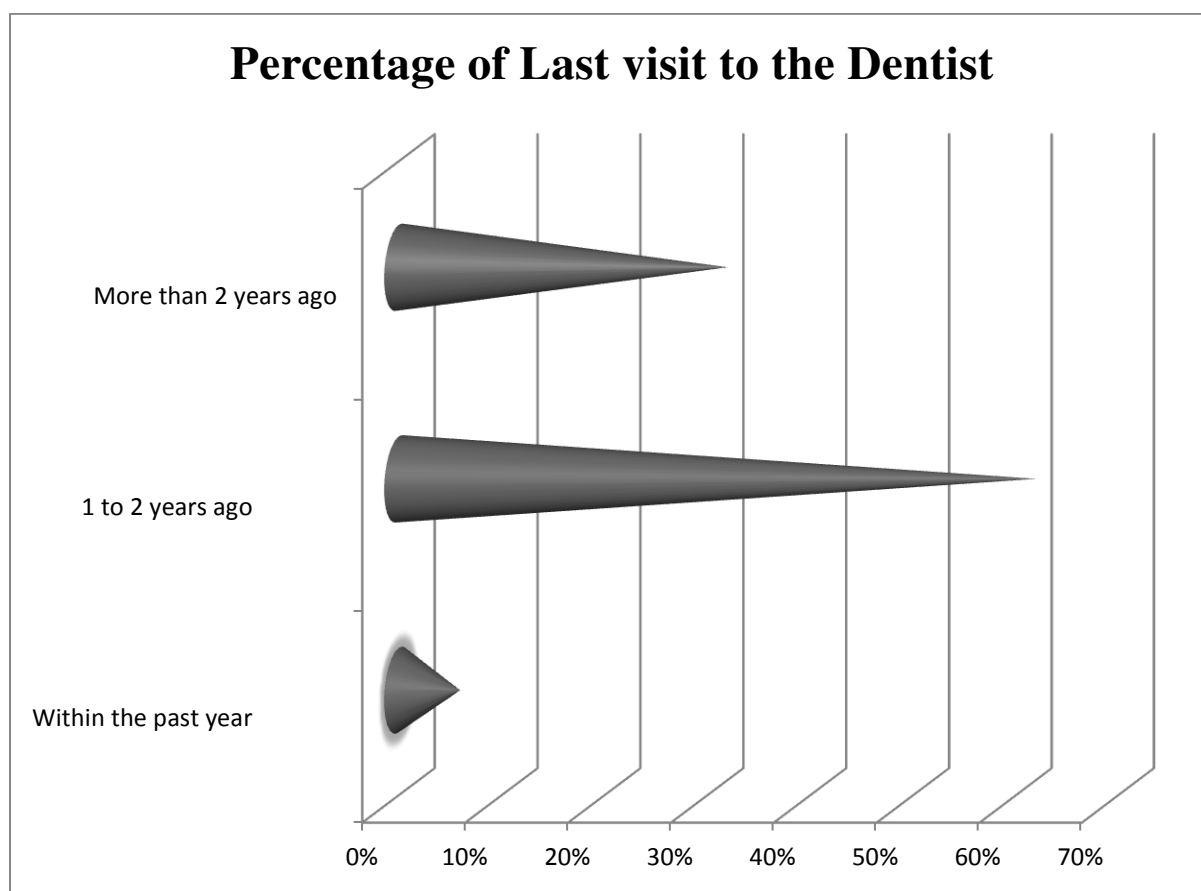


Figure 4.19: Last visit to the Dentist

From this chart we found that, the majority of the respondents (62 %) made their last visit to doctor 1-2 years ago

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.1.16 Status of visiting GP

Table 4.20: Status of visiting GP

Visiting GP	Number	Percentage
Within the past year	24	8%
1 to 2 years ago	73	24%
More than 2 years ago	197	66%
Never been to the GP	6	2%
<b>Total= 300</b>		

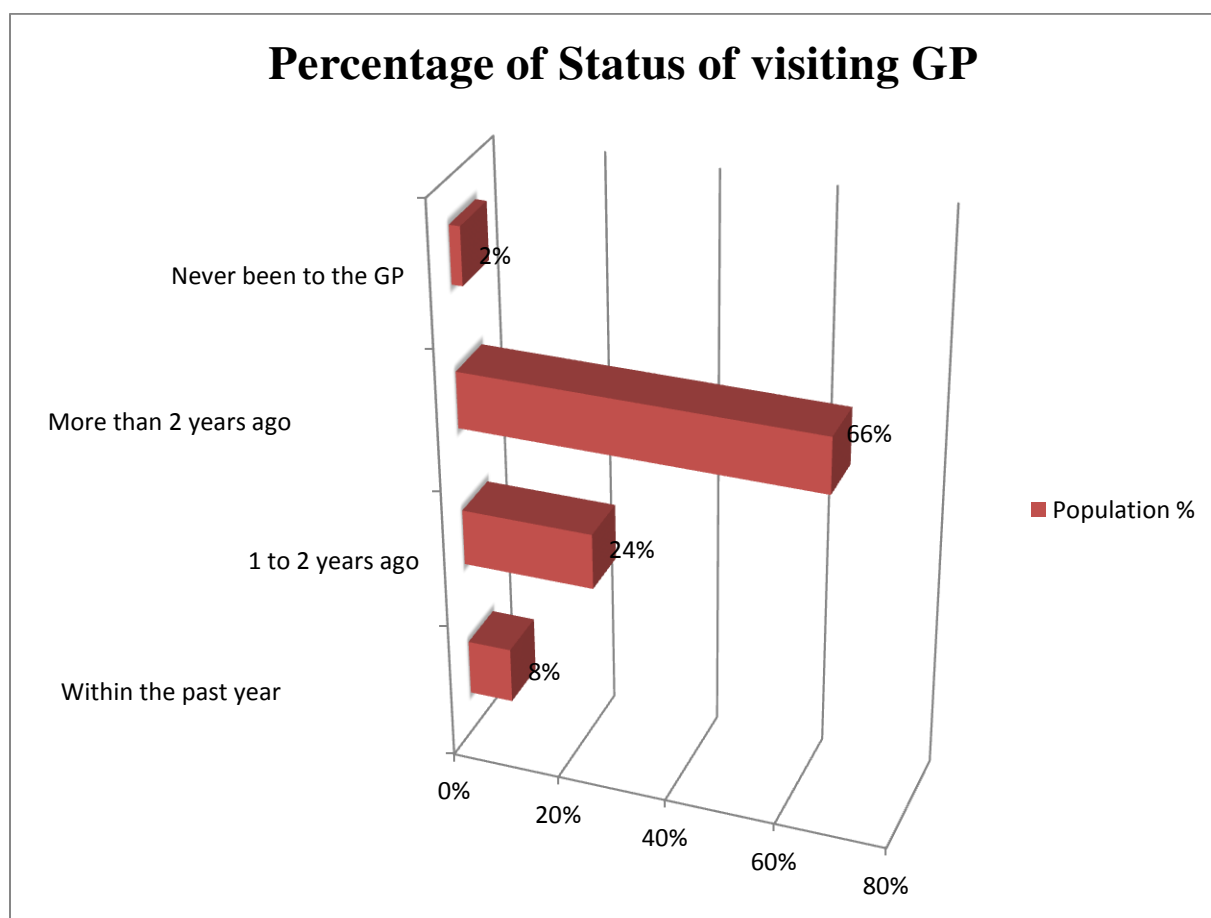


Figure 4.20: Status of visiting GP

From this pie chart we found that, the majority of the respondents (66 %) have visited a CP more than 2 years ago.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people



#### 4.1.17 People perception on maintaining oral hygiene

Table 4.21: People perception on maintaining oral hygiene

People perception on maintaining oral hygiene	Number	Percentage
Daily brushing	278	93%
Daily brushing+ Mouthwash user	21	7%
Others	1	0%
<b>Total= 300</b>		

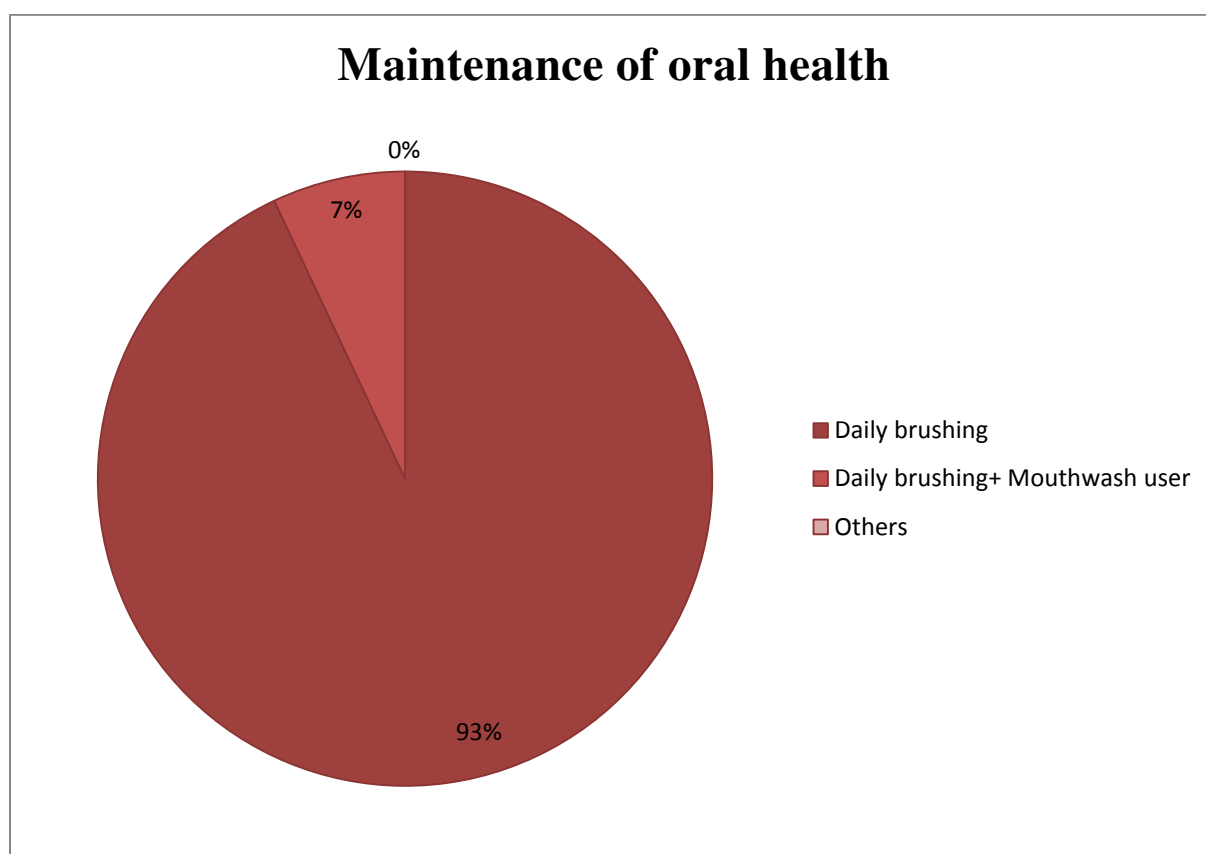


Figure 4.21: People perception on maintaining oral hygiene

From this chart we found that, the majority of the respondents (93 %) daily brush their teeth.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.2.1 Knowledge about oropharyngeal cancer

Table 4.22: Knowledge about oropharyngeal cancer

Knowledge about oropharyngeal cancer	Number	Percentage
Yes	13	4%
May be	43	15%
Don't know	244	81%
<b>Total= 300</b>		

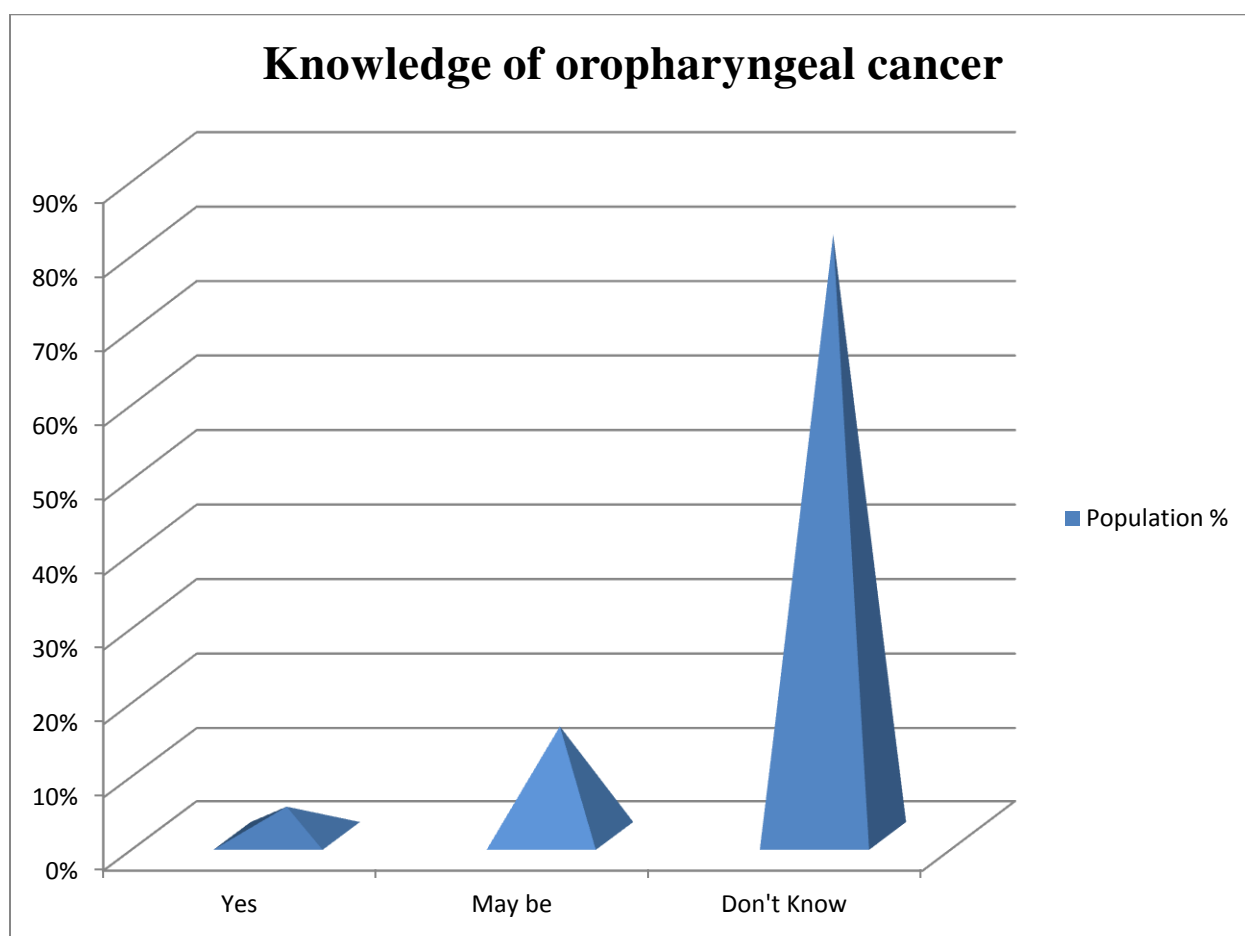


Figure 4.22: Knowledge about oropharyngeal cancer

From this chart we found that, most of the respondents (81 %) do not know about oropharyngeal cancer.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.2.2 Knowledge about oropharynx cancer development

Table 4.23: Knowledge about oropharynx cancer development

Knowledge about oropharynx cancer development	Number	Percentage
tonsils	58	19%
base of tongue	50	17%
back of throat	116	39%
all above	76	25%
<b>Total= 300</b>		

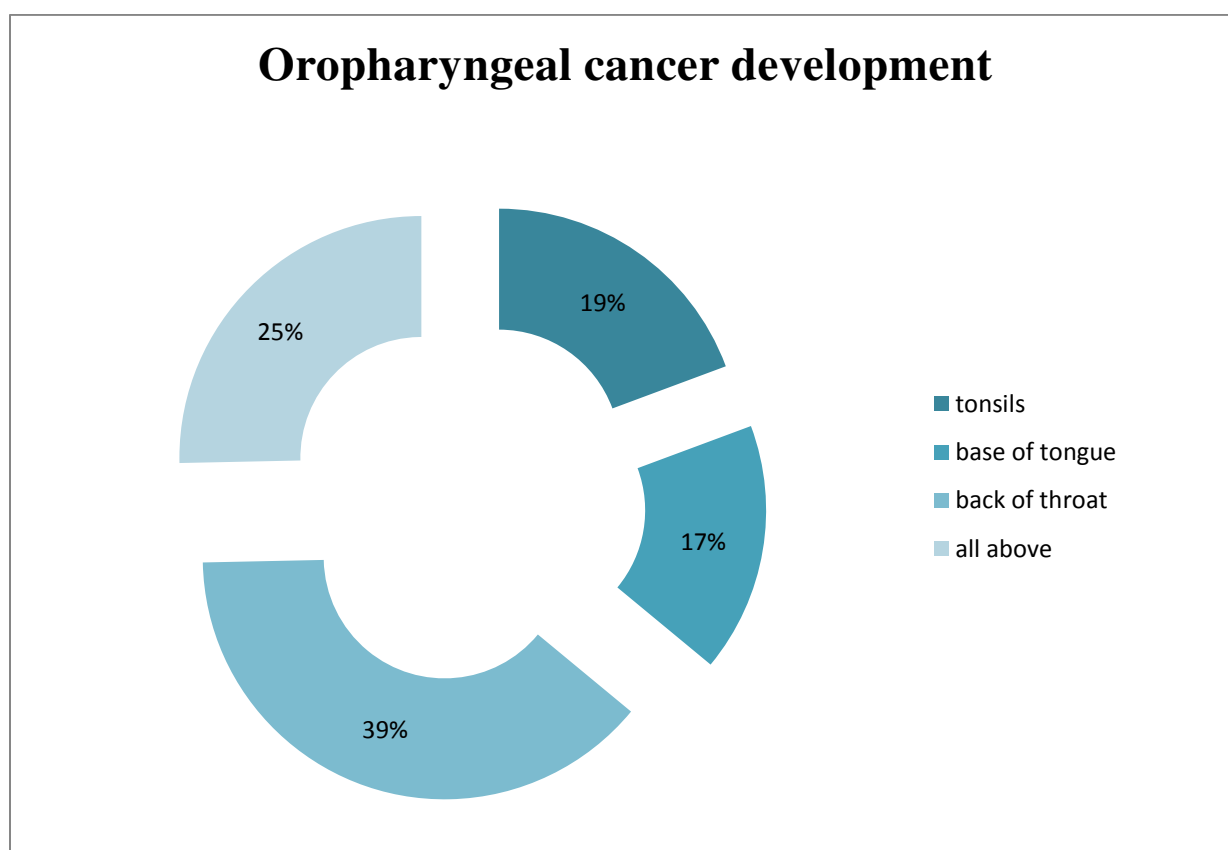


Figure 4.23: Knowledge about oropharynx cancer development

From this chart we found that, most of the respondents (82 %) thought that oropharyngeal cancer developed in back of throat.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

### 4.2.3 Knowledge about reason behind developing oropharyngeal cancer

Table 4.24: Knowledge about reason behind developing oropharyngeal cancer

<b>Knowledge about reason behind developing oropharyngeal cancer</b>	<b>Number</b>
Smoking tobacco	300
Being infected with human papillomavirus (HPV)	19
Consuming heavy alcohol	293
Poor diet/nutrition	243
Smokeless tobacco intake	16
Using Cigars and Pipes	153
Dentures and Poor Dentition	255
Prolonged sun exposure ( UV Radiation)	170
Nickel exposure	1
Weakened immune system	8
Drink strong 'filter' coffee	25
Drink decaffeinated coffee	24
Overeat	6
Have lost all their teeth	4
Are over 50 years old	9
Are a man	3
Are a woman	4
Marijuana use	288

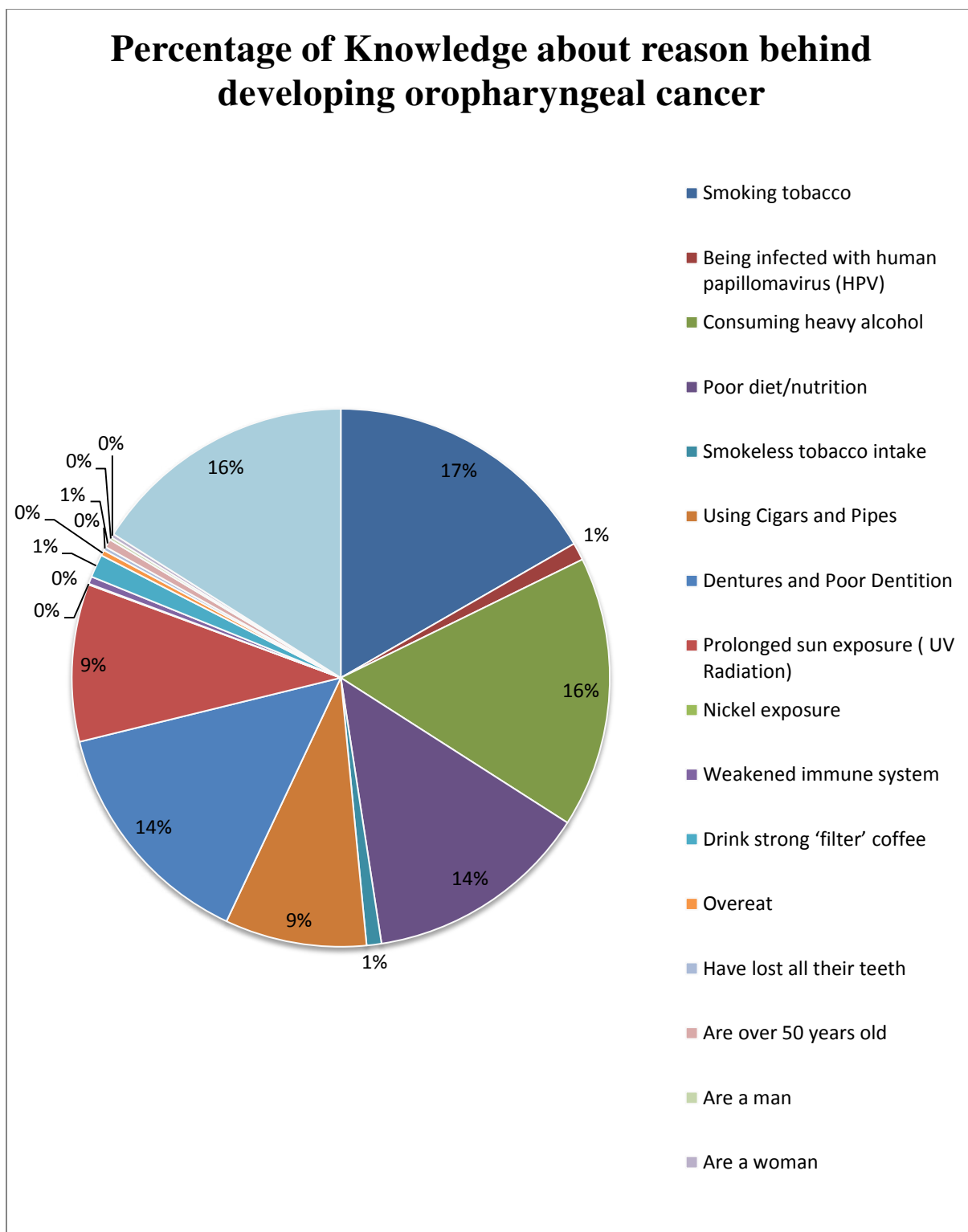


Figure 2.24: Knowledge about reason behind developing oropharyngeal cancer

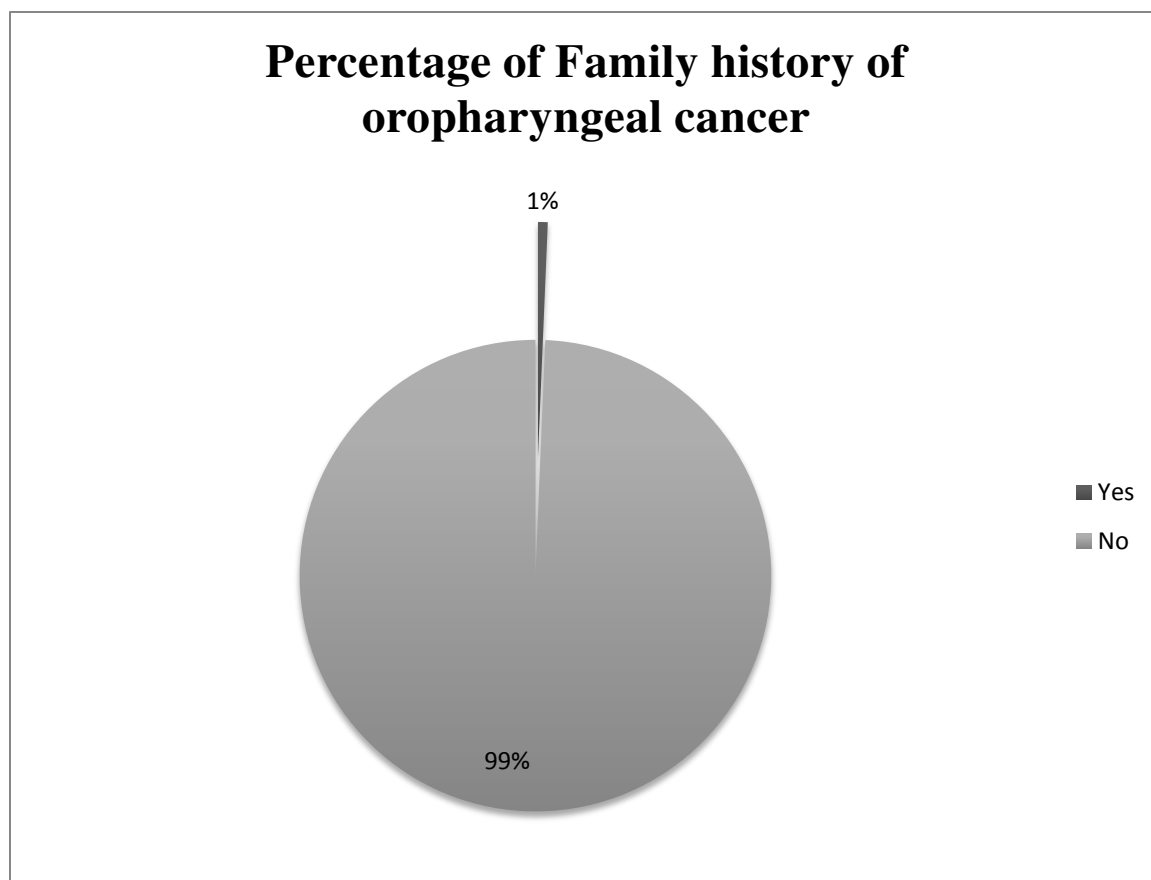
From this chart we found that, all of the respondents (300) thought that oropharyngeal cancer developed from smoking tobacco.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.2.4 Family history of oropharyngeal cancer

Table 4.25: Family history of oropharyngeal cancer

Family History of oropharyngeal cancer	Number	Percentage
Yes	2	1%
No	298	99%
<b>Total= 300</b>		



**Figure 4.25: Family history of oropharyngeal cancer**

From this chart we found that, most of the respondents (99%) have no family history of oropharyngeal cancer.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.2.4.1 Family history can be a risk of oropharyngeal cancer

Table 4.26: Family history can be a risk of oropharyngeal cancer

Family history can be a risk factor	Number	Percentage
Yes	1	50%
May be	1	50%
Don't know	0	0%
<b>Total= 2</b>		

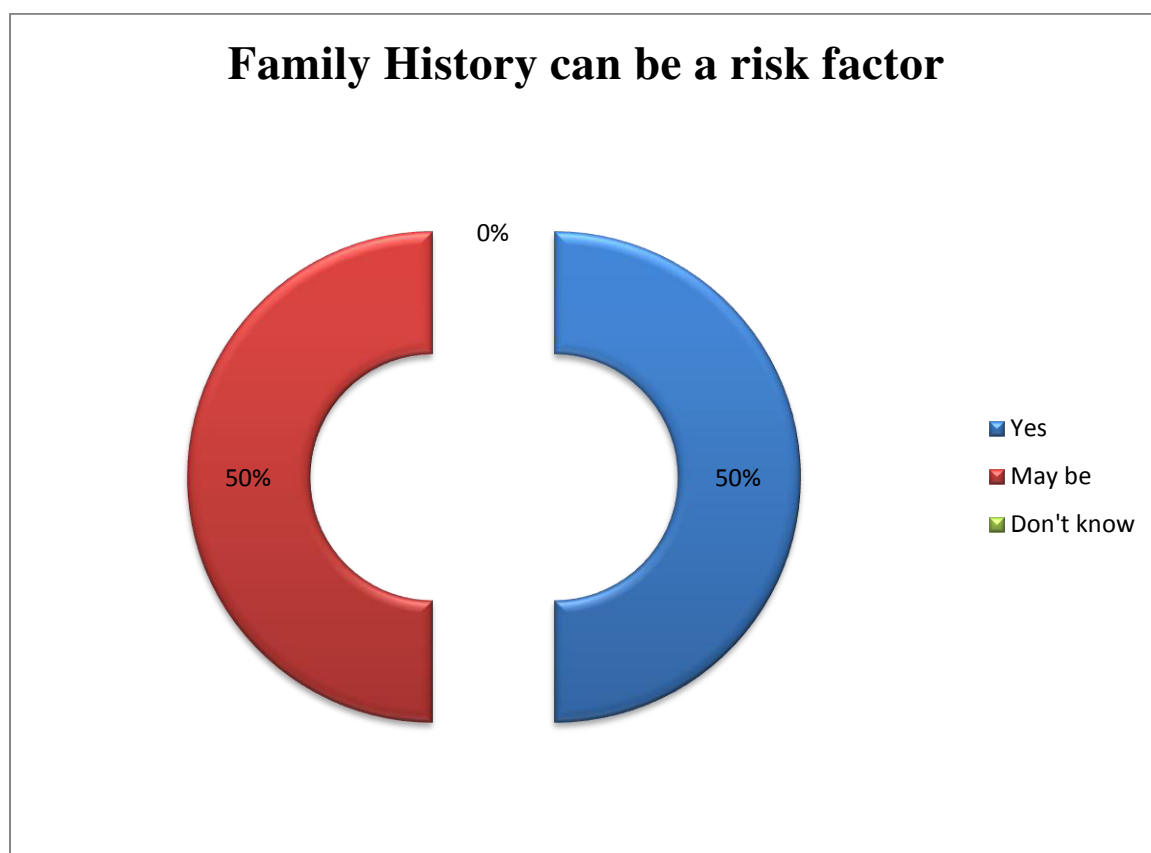


Figure 4.26: Family history can be a risk of oropharyngeal cancer

From this chart we found that, 50% of the respondents thought family history can be a risk factor and other 50% did not think of.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.2.5 Knowledge about diet

Table 4.27: Knowledge about diet

Knowledge about diet	Number	Percentage
Low intake of Vitamin C	293	26%
Low intake of Beta- Carotene	188	17%
Low intake of Vitamin A & E	265	23%
Iodine deficiency	232	20%
High Fat intake	129	11%
High intake of Fruits & Vegetables	38	3%
<b>Total= 300</b>		

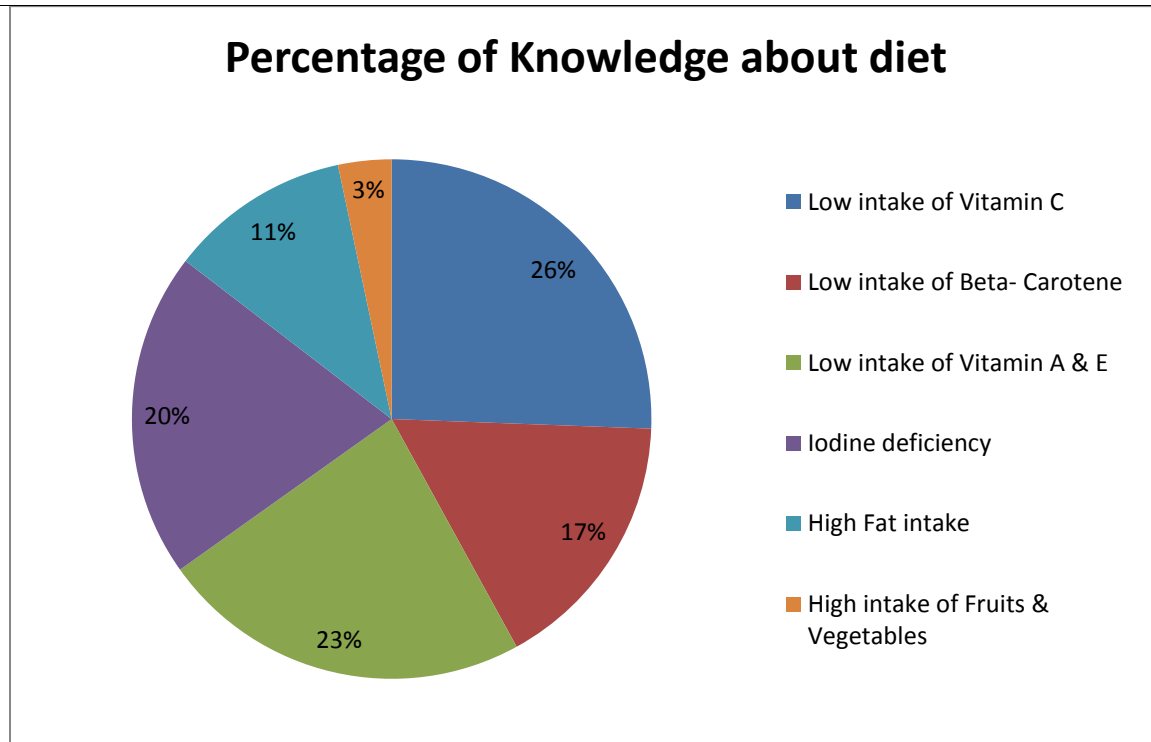


Figure 4.27: Knowledge about diet

From this chart we found that, most of the respondents (26%) thought Low intake of Vitamin C causes oropharyngeal cancer.



#### 4.2.6 Knowledge about the treatment of oral and oropharyngeal cancer

Table 4.28: Knowledge about the treatment of oral and oropharyngeal cancer

Knowledge about the treatment of oral and oropharyngeal cancer	Number	Percentage
Yes	131	13%
No	169	87%
<b>Total= 300</b>		

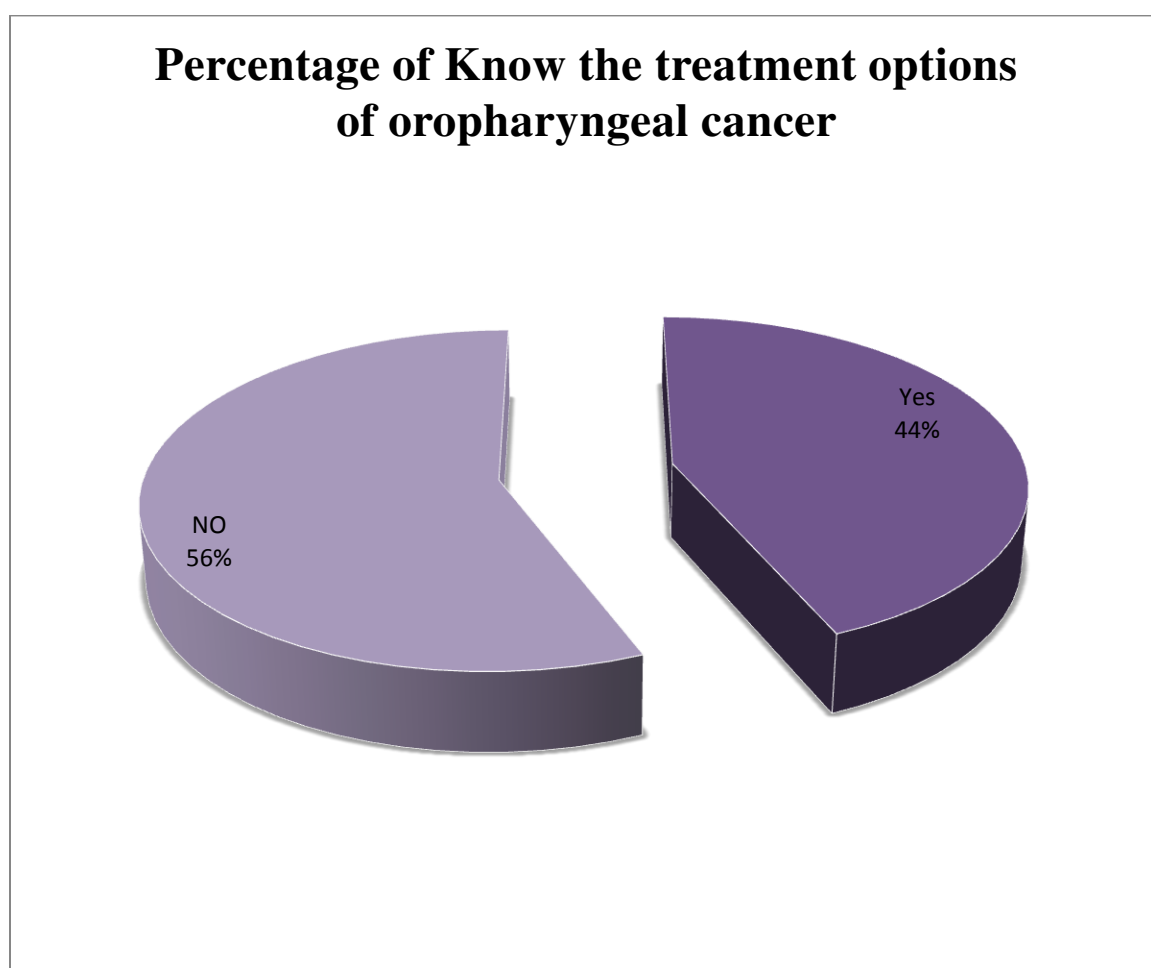


Figure 4.28: Knowledge about the treatment of oral and oropharyngeal cancer

From this chart we found that, most of the respondents (87%) know the treatment options of Oropharyngeal cancer.

An assessment of knowledge and awareness of Oral and Oropharyngeal cancer among Bangladeshi people

#### 4.2.6.1 Treatment for oral and oropharyngeal cancer

Table 4.29: Treatment for oral and oropharyngeal cancer

Treatment for oral and oropharyngeal cancer	Number	Percentage
Surgery	32	19%
Radiation therapy	4	3%
Chemotherapy	124	74%
Immunotherapy	2	1 %
Targeted therapy	5	3 %
<b>Total= 167</b>		

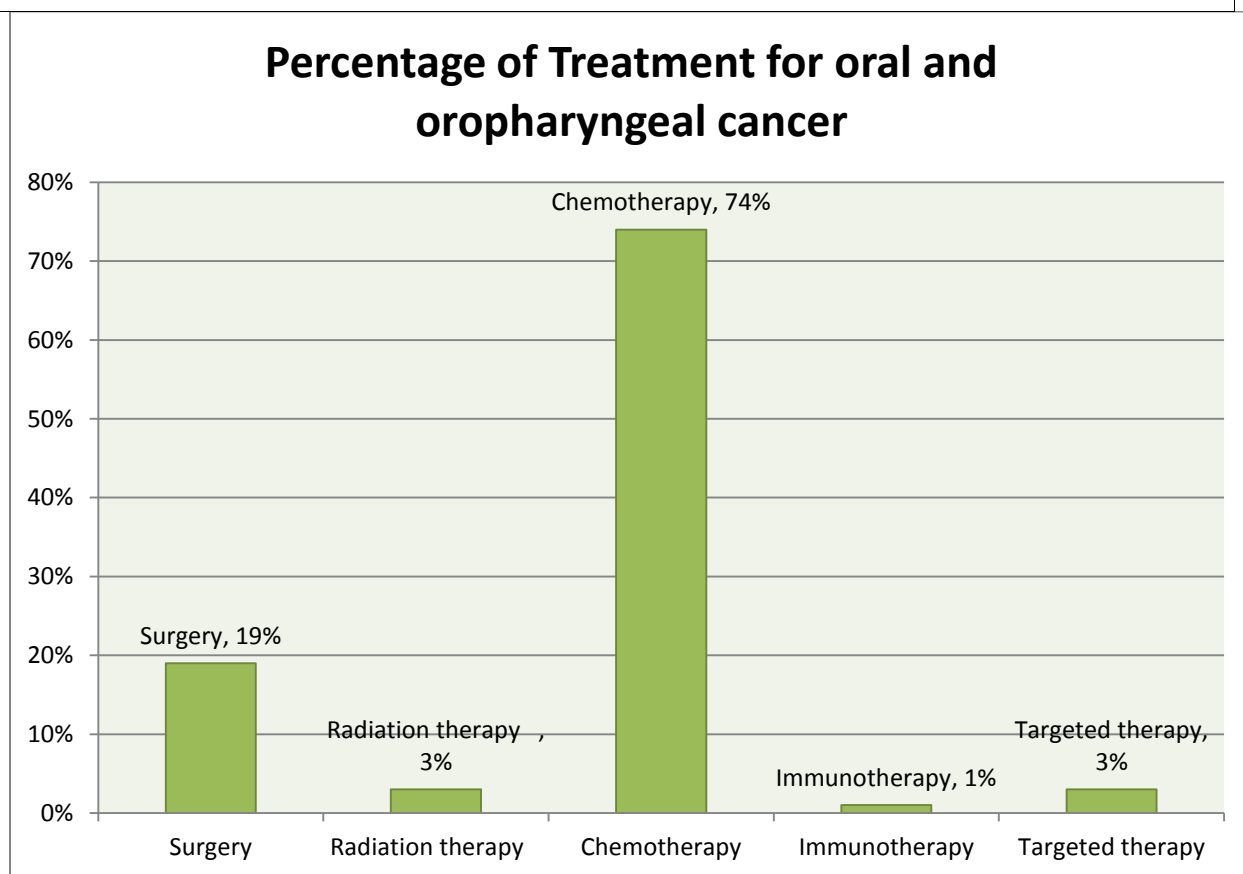


Figure 4.29: Treatment for oral and oropharyngeal cancer

From this chart we found that, most of the respondents (74%) prefer Chemotherapy as the treatment of oropharyngeal cancer.

#### 4.2.7 Knowledge of HPV (Human Papilloma Virus) vaccine

Table 4.30: Knowledge of HPV (Human Papilloma Virus) vaccine

Knowledge of HPV (Human Papilloma Virus) vaccine	Number	Percentage
Yes	292	99%
No	8	1%
<b>Total= 300</b>		

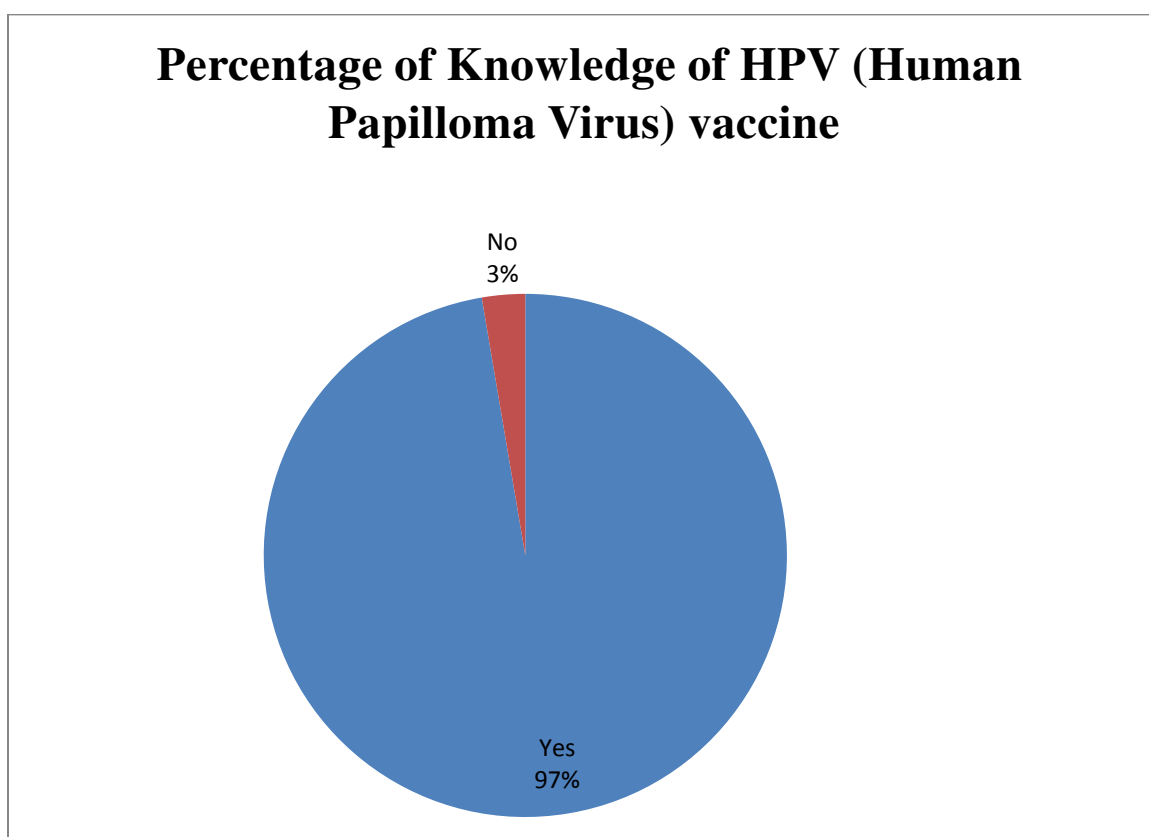


Figure 4.30: Knowledge of HPV (Human Papilloma Virus) vaccine

From this chart we found that, most of the respondents (99%) think that HPV (Human Papilloma Virus) vaccine helps to keep free from oropharyngeal cancer.

#### 4.2.8 Knowledge of recommended age for HPV (Human Papilloma Virus) vaccine

Table 4.31: Knowledge of recommended age for HPV (Human Papilloma Virus) vaccine

Recommended age for HPV	Number	Percentage
9-26	149	50%
26-50	30	10%
After birth	121	40%
<b>Total= 300</b>		

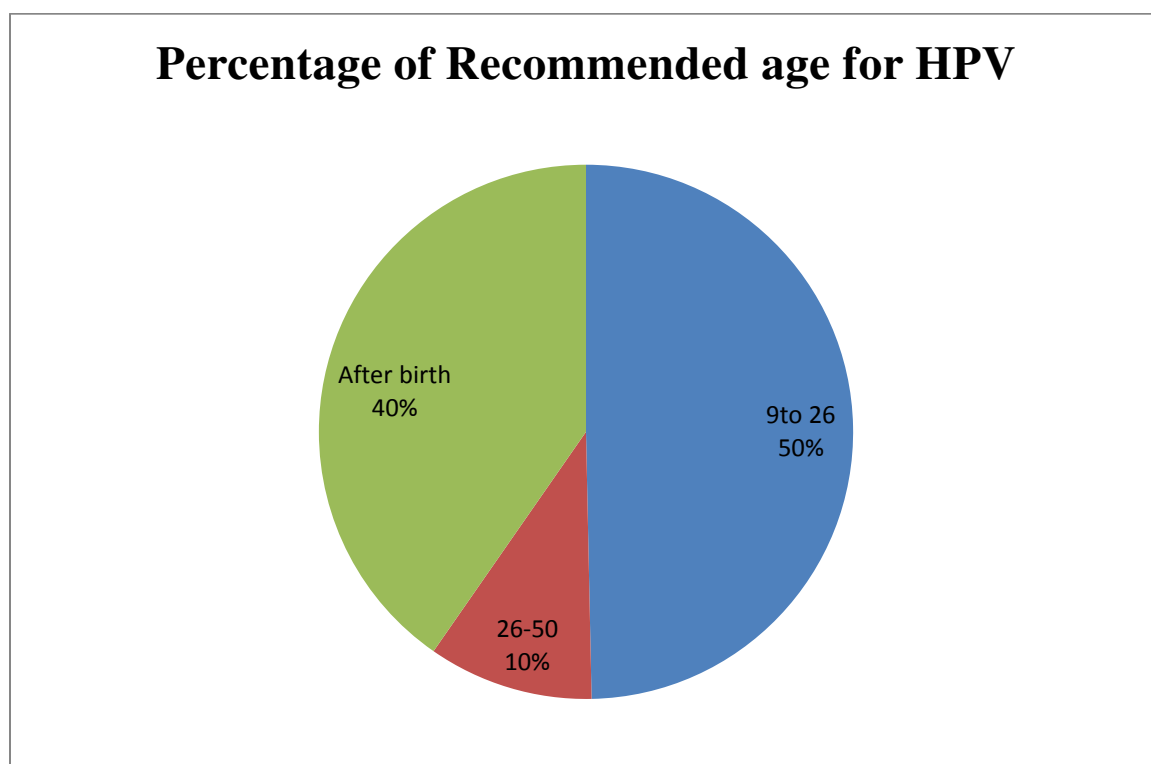


Figure 4.31: Knowledge of recommended age for HPV (Human Papilloma Virus) vaccine

From this chart we found that, most of the respondents (50%) think that recommended age for HPV (Human Papilloma Virus) vaccine is 9 to 26.

#### 4.2.9 Preferable option that make safe from oropharyngeal cancer

Table 4.32: Preferable option that make safe from oropharyngeal cancer

Preferable option that make safe from oropharyngeal cancer	Number	Percentage
a therapeutic vaccine while getting affected with HPV	21	1%
a preventative vaccine before infected with HPV	274	99%
Other	5	0%
<b>Total= 300</b>		

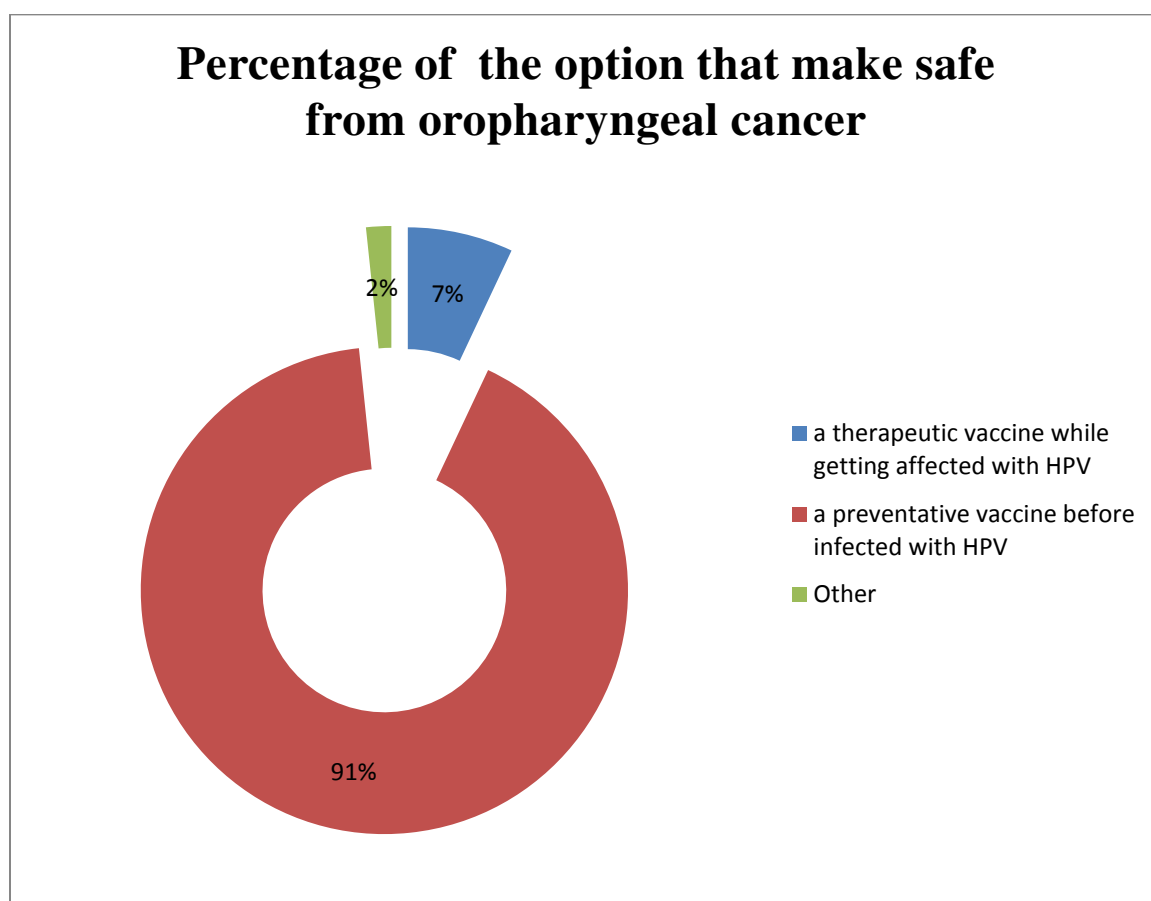


Figure 4.32: Preferable option that make safe from oropharyngeal cancer

From this chart we found that, most of the respondents (91%) think that a preventative vaccine before infected with HPV will make them safe from oropharyngeal cancer.

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#### 4.2.10 The preventive ways to reduce from oropharyngeal cancer

Table 4.33: The preventive ways to reduce from oropharyngeal cancer

The preventive ways to reduce from oropharyngeal cancer	Number	Percentage
Stopping the use of tobacco Products	124	41%
Stopping the intake of alcohols	106	35%
Making healthy lifestyle choices	23	8%
Above all	47	16%
<b>Total= 300</b>		

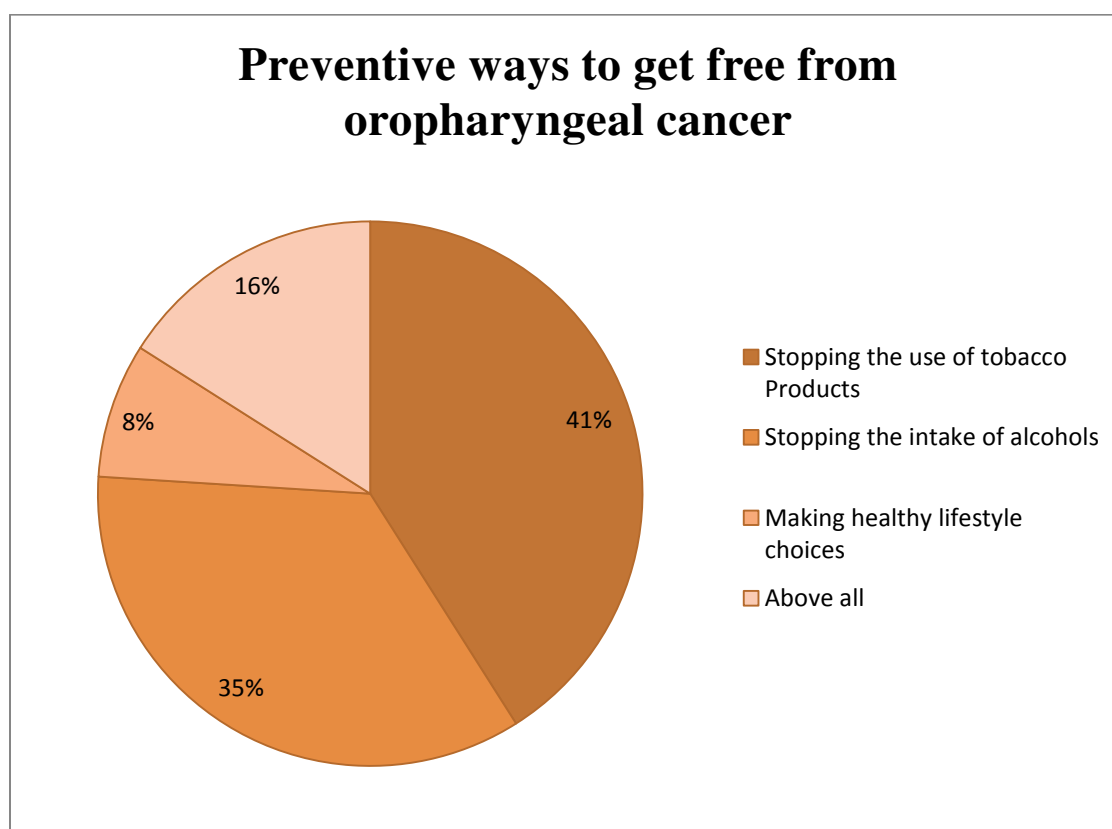


Figure 4.33: The preventive ways to reduce from oropharyngeal cancer

From this chart we found that, most of the respondents (41%) think that stopping the use of tobacco Products will be the preventative way to get free from oropharyngeal cancer.

# Chapter-5

## Discussion and Conclusion

## Discussion

Bangladesh is a developing country and cancer is a great concern for the people living there. Oropharyngeal cancer is quiet unknown in the developing countries. Oral health is very important part of human health and poor oral health often factors of oral cancer. Oral cancer is very alarming disease that affects many people each year all over the world. We did a study on the mass people of different shopping mall and tea stall beside the road in Dhaka city of Bangladesh.

In Bangladesh more than 7000 people are newly diagnosed each year and among them 6.6% people are died due to their life style and other factors. 14.1% population having cancer are mainly diagnosed oropharyngeal cancer. However, Government has already taken lots of initiative to make people conscios such as advertisement, community hospital for rural area. But, there is no good infrastructure about oral health in Bangladesh. Due to this challenge, many incidences are not captured in the cancer registry (Sultana and Malik, 2014).

The study was conducted on 300 populations where 15% people were aged 20-25, 55% people were aged of 26-30%, 22% people were aged 31-35, and 8% people are under the age of 36-40 and we came to know the current prevalence and risk factors for oral carcinoma. Among them 96% were male and 4% were female and mainly male are affected.

In our study 38% were nonsmoker, 58% were current smoker and 4% were former smoker. 100% of the current smokers take more than 10 packs of cigarette in a year. Almost 90% of all oral cancers are caused by tobacco. Cigarettes are the most common of the various forms of smoked tobacco. Smokers have 27 fold more chances of developing OSCC in comparison with non-smokers (Brown L. *et al.*, 2012).

Besides 81% of people never intake any type of alcohol where 16% intake light alcohol and rest of 3% intake heavy alcohol. Globally 70% of patients with oral cancer are found to have a history of Heavy alcohol intake (cancer.org, 2016).



According to the study 71% of people used mouth wash once daily and 24% were using twice daily but only 5% people knew that mouthwash contains high alcohol.

The study also found the carelessness of the people about their oral health. 91% of the people did not consult a Doctor if ever felt a lump or thickening inside the mouth and 97% of people did not consult with doctor if ever felt a painful mouth sore that doesn't heal. And so 65 % of the people face problem due to less attention on dental health but 80% of them did not consult with a dentist to check up oral health. According to the study only 60% of people last visited dentist 1-2 years ago and 66% people visited GP 2 years ago.

In our study only 4 % people knew about oropharyngeal cancer and 82 % of them thought that oropharyngeal cancer developed in back of throat and all of them thought that Smoking is responsible for developing it. 99% of people thought that family history cannot be a cause of developing oropharyngeal cancer but 26% thought Low intake of Vitamin C can be.

According to the study 74% of people preferred Chemotherapy as the treatment of oropharyngeal cancer and 99% thought that HPV (Human Papilloma Virus) vaccine helped to keep free from oropharyngeal cancer. 91% thought that a preventative vaccine before infected with HPV will make them safe from oropharyngeal cancer and 41% thought that stopping the use of tobacco Products will be the preventative way to get free from oropharyngeal cancer.

### **Conclusion**

Oral health is very important part of human health and cannot lead healthy life without it. A good oral health enables a person to eat, speak and socialize without active diseases, discomfort or embarrassment. Cancer of the oral cavity is one of the common malignancies in developing countries. It is common in males compared to females and is usually seen after middle age. The incidence of oral cancer is increasing, however, in the younger generation in recent years. Etiology of oral and oropharyngeal malignancy is multifactorial, but the commonest etiological factors found are tobacco and alcohol consumption. Social awareness need to rise against oral and oropharyngeal cancer. The study lacks information due to some limitations like lack of co-operation, misguidance, avoidance, lacking of understanding of the questionnaire by the people. This study will help the people to be aware of the causes of Oral and oropharyngeal cancer. In future it will help to improve oral health, reduce the use of tobacco and improve the frequency of visiting a dentist. As Oral and oropharyngeal cancer is not familiar with the community public awareness should be improved by eliminating the cause like tobacco use, marijuana use, alcohol intake. Besides, arranging campaign, media, social networking site may also improve the condition.

# Chapter-6

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## Annexure

(All the questions are asked for research purpose only and will be kept confidential)

### Part 1: Demographic Data

1. Age: \_\_\_\_\_
  2. Gender:   Male    Female
  3. Education:   Up to SSC/ HSC   Graduate   Post Graduate   Illiterate
  4. Occupation:   Teacher    Businessman   Service holder  
                          House-wife   Student           Others
  5. Monthly income:    < 10,000    10,000-30,000    30,000<
  6. Living Area:  
.....
  7. Your smoking status:   Never smoked   Current smoker   Former smoker
  - 7.1 If u r a current smoker, Do you smoke more than 10 packs in a year?  
Yes                   Less than 10 pack                   Never smoke                   Quit smoking
  - 7.2 If you have stopped smoking cigarettes, how long ago did you stop?  
6 months to a year ago   1 to 2 years ago   2 to 5 years ago  
5 to 10 years ago                   More than 10 years ago
  8. Do you take heavy alcohols?   Yes   Light alcohol   Never take
  9. Do you use mouthwashes?   Yes   No                   Often
- If yes, then how many times you use it in a day? Once daily Twice daily More than twice daily
10. Do you know that mouthwashes contains high alcohols that may cause Oral cancer if use it more than twice daily?                   Yes   No
  11. Have you ever felt a lump or thickening inside the mouth? -----  
-----
- If yes, then do you consult with a Doctor for this?   Yes   Often   Never
- If never,  
why?.....
12. Have you ever felt a painful mouth sore that doesn't heal? -----
- If yes, then do you consult with a Doctor for this?                   Yes   No

13. Have you ever felt Pain or difficulty swallowing or chewing and difficulty moving the jaw or tongue? -----

If yes, then do you consult with a Doctor for this? Yes No

If never, why?

.....

14. Do you feel all these problems are due to your less attention on dental health?

Yes No Don't know / May be

15. Have you consult with a dentist to check up you oral health? Yes No

16. How long ago was your last visit to the Dentist?

Within the past year 1 to 2 years ago More than 2 years ago

Why?

.....

17. In general do you go to the Dentist for:

A regular check up An occasional check up Only when having trouble with your teeth

18. When did you last visit your GP?

Within the past year 1 to 2 years ago  
More than 2 years ago Never been to the GP

19. What you normally do for maintaining your oral health?

.....

.....

20. Compared with other people around you about the same age, what would you say your dental health is? Good Bad

If bad,

why?.....

### **Part 2: Awareness and Knowledge on Oropharyngeal and Oral cancer**

21. Do you know what is oropharyngeal cancer? Yes May be  
Don't know



22. In which part of oropharynx this cancer may develop?

- tonsils                      base of tongue                      back of throat                      all above

23. Tick on the reason behind oropharyngeal cancer you think..?

- a. Smoking tobacco.....
- b. Being infected with human papillomavirus (HPV).....
- c. Consuming heavy alcohol.....
- d. Poor diet/nutrition.....
- e. Using mouthwash more than twice in a day.....
- f. Smokeless tobacco intake.....
- g. Using Cigars and Pipes.....
- h. Dentures and Poor Dentition.....
- i. Prolonged sun exposure (UV Radiation).....
- j. Nickel exposure.....
- k. Weakened immune system.....
- l. Drink strong 'filter' coffee
- m. Drink decaffeinated coffee
- n. Overeat
- o. Have lost all their teeth
- p. Are over 50 years old
- q. Are a man
- r. Are a woman
- s. Marijuana use

24. Is any of your family member has oropharyngeal cancer?    Yes                      No

If yes, then do you think you may be at a risk of oropharyngeal cancer?

- Yes                      May be                      Don't know                      May be

25. Which of the following diet factor may cause Oral Cancer? Tick Yes or No

	Yes	No
Low intake of Vitamin C		
Low intake of Beta- Carotene		
Low intake of Vitamin A & E		
Iodine deficiency		
High Fat intake		
High intake of Fruits & Vegetables		

26. Do you have any idea about the treatment options for oral and oropharyngeal cancer?

- Yes                      No

If Yes, Then what should be the treatments from following you think?

Surgery Radiation therapy Chemotherapy Immunotherapy Targeted therapy

27. **Do you think HPV (Human Papilloma Virus) vaccine will help you to keep free from oropharyngeal cancer?** Yes No

**If No, then specify the reason you think:.....**

28. What should be the recommended age for getting this vaccine?

9-26 years old 26-50 years old After birth

29. To keep yourself safe from oropharyngeal cancer which one is more preferable to you?

a therapeutic vaccine while getting affected with HPV

a preventative vaccine before infected with HPV

30. What should be the preventive ways to get free from oropharyngeal cancer you think?

Stopping the use of tobacco Products Stopping the intake of alcohols

Making healthy lifestyle choices Above all

*Thank you for co-operation*