

# **A Survey on Risk Factors, Common Treatment Pattern of Periodontal Disease & Behavioral Impact of People on this Disease in Dhaka City**

**A Dissertation submitted to the Department of Pharmacy, East West University, in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy**

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# **Declaration by the Research Candidate**

**Sanjida Akter Suchana, ID: 2013-1-70-063**, hereby declare that the dissertation entitled “*A Survey on Risk Factors, Common Treatment Pattern of Periodontal Diseases & Behavioral Impact of People on this Disease in Dhaka City*” 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, under the supervision and guidance of **Marjana Khalil**, Lecturer, Department of Pharmacy, East West University, Dhaka.

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# Certificate by the Supervisor

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# **Certificate by the Chairperson**

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## *Dedication*

*This research paper is dedicated to  
my beloved parents who are my  
biggest inspiration for every single  
step of my life.*

## Table of Contents

Serial No	Contents	Page No.
	List of Table	v
	List of Figure	vii
	Abstract	ix
	<b>Chapter One: Introduction</b>	
1.1	Periodontal Disease	1
1.2	Anatomy of tooth	1
1.2.1	Structure of a tooth	2
1.2.2	Structures around the tooth	3
1.3	Warning signs that signal a problem	3
1.4	Factors involved in increasing gum disease	4
1.5	Association of gum disease with other diseases	4
1.6	Types of gum disease	5
1.6.1	Gingivitis	5
1.6.1.1	Factors of gingival disease	5
1.6.1.2	Types of gingival disease	6
1.6.1.3	Medications affecting gingivitis	7
1.6.1.4	Malnutrition	7
1.6.1.5	Non plaque-induced gingival lesions	7
1.6.1.6	Diagnosis of gingivitis	7
1.6.1.7	Cleaning of teeth	8
1.6.1.8	Medications	8

<b>Serial No</b>	<b>Contents</b>	<b>Page No</b>
1.6.2	Periodontitis	9
1.6.2.1	Symptoms of periodontitis	10
1.6.2.2	Types of periodontitis	10
1.6.2.3	Risks and prevention	12
1.6.2.4	Diagnosis of periodontitis	15
1.6.2.5	Treatment of periodontitis	15
1.6.2.6	Effects of lifestyles in preventing periodontitis	17
1.7	Differences between gingivitis and periodontitis	17
1.8	Treatment of gum disease	18
1.8.1	Deep cleaning (Scaling and root planning)	18
1.8.2	Medications	18
1.8.3	Surgical treatments	20
1.9	Maintaining of healthy teeth and gums	21
1.10	Association of gum disease with other problems beyond the mouth	21
	<b>Chapter 2: Aim and Objective</b>	
	Aim and Objectives	23
	<b>Chapter 3: Literature Review</b>	
	Literature Reviews	24-29
	<b>Chapter 4: Method and Materials</b>	
4.1	Method and Materials	30
4.2	Questionnaire for survey (Patient Interview)	30
4.3	Prescription Sample	33
	<b>Chapter 5: Result</b>	
5.1	Gender Distribution of participants	34
5.2	Age Variation of tested Population	34
5.3	Common problems in participants in case of periodontal disease	35
5.4	Frequency of brushing of people	36
5.5	Frequency of using Floss and Oral Rinse among tested population	37



<b>Serial No</b>	<b>Contents</b>	<b>Page No</b>
5.6	Prevalence of Gum Disease in people	37
5.7	People having bad habits that are harmful for oral hygiene	38
5.8	Common Symptoms of Periodontal Disease in patients	39
5.9	Consumption rate of alcohol containing drinks among people	40
5.10	Taking Medications to improve oral conditions	40
5.11	Types of medicines prescribed to patients	41
5.11.1	Antiulcerants which are commonly prescribed to patients	42
5.11.1.1	Commonly used Brand of Rabiprazole	43
5.11.1.2	Commonly used Brand of Omeprazole	44
5.11.1.3	Brand of Esomeprazole	45
5.11.1.4	Brand of Pantoprazole	46
5.11.2	Antibiotics	47
5.11.2.1	Brand of Cefradin	48
5.11.2.2	Brand of cefadroxil	48
5.11.2.3	Brand of cefixime	49
5.11.3	Painkillers	50
5.11.3.1	Prescribed Brand of Ketorolac	51
5.11.3.2	Brand of NSAIDs	52
5.11.3.3	Brand of Etoricoxib	53
5.11.4	Antiprotozoals	54
5.11.5	Additional Medications	55
5.12	Use of Medicated Toothpastes and Mouthwashes	55
5.12.1	Brand of Mouthwash	56
5.12.2	Brand of Medicated Toothpaste	57
5.13	Complications which are most commonly observed in patients with periodontal diseases	58
	<b>Chapter 6: Discussion</b>	
	Discussion	59-61

	<b>Chapter 7: Conclusion</b>	
	Conclusion	62
	<b>References</b>	63-67

## List of Table

<b>Table No</b>	<b>Table Name</b>	<b>Page No</b>
Table 1.1	Differences between gingivitis and periodontitis	17
Table 1.2	Medications used in the treatment of periodontal disease	19
Table 5.1	Gender distribution	34
Table 5.2	Age variation	34
Table 5.3	Common problems in participants	35
Table 5.4	Frequency of brushing	36
Table 5.5	Frequency of using floss and oral rinse	37
Table 5.6	Prevalence of gum disease	37
Table 5.7	People having bad habits that are harmful for oral hygiene	38
Table 5.8	Common Symptoms of Periodontal Disease	39
Table 5.9	Consumption rate of drinks containing alcohol	40
Table 5.10	Taking medicine	40
Table 5.11	Types of medicines prescribed	41
Table 5.12	Commonly used Antiulcerants	42
Table 5.13	Brand of Rabiprazole used	43
Table 5.14	Brand of Omeprazole used	44
Table 5.15	Brand of Esomeprazole used	45
Table 5.16	Brand of Pantoprazole used	46
Table 5.17	Widely prescribed antibiotics	47
Table 5.18	Brand of Cefradin used	48
Table 5.19	Brand of Cefadroxil used	48
Table 5.20	Brand of Cefixime used	49
Table 5.21	Commonly used painkiller	50
Table 5.22	Brand of Ketorolac	51
Table 5.23	Brand of NSAIDs	52
Table 5.24	Brand of Etoricoxib	53
Table 5.25	Most common brands of Metronidazole used	54

<b>Table No</b>	<b>Table Name</b>	<b>Page No</b>
Table 5.26	Additional drugs in the treatment of gum disease	55
Table 5.27	Use of medicated toothpastes and mouthwashes	56
Table 5.28	Brand of Mouthwashes	56
Table 5.29	Brand of Medicated Toothpaste	57
Table 5.30	Observed complications in patients with periodontal disease	58

## List of Figure

<b>Figure No</b>	<b>Figure Name</b>	<b>Page No</b>
Figure 1.1	Anatomy of a tooth	2
Figure 1.2	Upper Jaw Acute Gingivitis	5
Figure 1.3	Periodontitis	9
Figure 1.4	Extent of periodontitis	9
Figure 1.5	Chronic and Aggressive periodontitis	11
Figure 1.6	Periodontitis in Diabetic Patient	12
Figure 1.7	Necrotizing periodontal disease	12
Figure 4.3	Prescription Sample	33
Figure 5.1	A pie chart showing the percentage of male and female among total participants	34
Figure 5.2	Age variation of tested Population	35
Figure 5.3	Common Problems in patients	36
Figure 5.4	Frequency of brushing	36
Figure 5.5	Frequency of using Floss or Oral Rinse	37
Figure 5.6	People diagnosed with gum disease	38
Figure 5.7	Habits of people which are harmful for oral hygiene	39
Figure 5.8	Common Symptoms of Periodontal Disease	39
Figure 5.9	Consumption rate of drink containing alcohol	40
Figure 5.10	Patients taking medicine	41
Figure 5.11	Types of medicines prescribed	42
Figure 5.12	Commonly prescribed Antiulcerants	43
Figure 5.13	Commonly used brand of Rabiprazole	44
Figure 5.14	Commonly used brand of Omeprazole	45
Figure 5.15	Commonly used Brand of Esomeprazole	46
Figure 5.16	Commonly used Brand of Pantoprazole	46
Figure 5.17	The classes of antibiotics prescribed widely	47
Figure 5.18	Commonly used Brand of Cefradin	48

<b>Figure No</b>	<b>Figure Name</b>	<b>Page No</b>
Figure 5.19	Commonly used brand of Cefadroxil	49
Figure 5.20	Commonly used Brand of Cefixime	50
Figure 5.21	Commonly used Pain killer	51
Figure 5.22	Commonly used Brand of Ketorolac	52
Figure 5.23	Commonly used Brand of NSAIDS	53
Figure 5.24	Commonly used Brand of Etoricoxib	54
Figure 5.25	Commonly used different brands of Metronidazole	55
Figure 5.27	Frequency of use of Medicated Toothpaste and Mouthwash	56
Figure 5.28	Commonly used Brand of Mouthwash	57
Figure 5.29	Commonly used Brand of Medicated Toothpaste	57
Figure 5.30	Types of complications in patients	58

# Abstract

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Periodontal disease is the disease related to gums and teeth. It can be classified as gingivitis and periodontitis. Gingivitis can lead to the severe form of gum disease called periodontitis. This survey has been conducted on 200 populations where 47% were male and 53% were female. Most of the people were in the age range of 26-40 years (16%) and 41-65 years (18%). The rest of the population was in the age range of below 25 years (11.5%) and above 65 years (1%). To find the association of periodontal disease with habits, the history of patients were analyzed. After this, it was found that 79.5% people had no habit of smoking, 61% people did not use betel leaf and 96% and 100% people did not consume alcohol and tobacco respectively. Only 1% people were identified who brush their teeth more than twice a day. A major portion of the people does not use floss (76%) and oral rinse (60%). 12.5% people use floss and 18.5% people use oral rinse once a day. Various types of complications have been seen in patients like tingling pain, tooth pain with fever, sensitivity, lose of tooth, red or swollen gums and tender or bleeding gums. The patients were prescribed with various types of medications such as Antiulcerants (84%), Antibiotics (81%), Pain killers (88%), Antiprotozoal (33%) and other medicines (5%). Among the Antiulcerants, Proton Pump Inhibitors (PPIs) are most commonly prescribed. Among PPIs, Rabiprazole (6%), Omeprazole (66%), Esomeprazole (16%) and Pantoprazole (7%) are prescribed. Seclo, Xeldrin and Opal are the common brand of Omeprazole. Different generations of Cephalosporins and Beta-lactam antibiotics are prescribed in the treatment of periodontal disease. Ketorolac and Etoricoxib are the commonly prescribed painkillers. There is a wide application of Antiprotozoal in treating gum disease. Metronidazole is the generic name of the drug which has most commonly been prescribed in the treatment of gum disease. But different brand of this drug is prescribed by different dentists. The most commonly used brands of Metronidazole are Filmet (61%), Flagyl (18%) and Flamyd (18%). Vitamin C, Calcium supplements and Antiseptics are also used to improve the oral conditions.

**Key Words:** Periodontal Diseases, Gingivitis, Periodontitis

# **Chapter One**

## **Introduction**



## 1.1 Periodontal Disease:

Periodontal disease is one of the most common diseases and this is responsible for most of the tooth loss in adults.

Periodontal disease is an inflammatory disease that affects the soft and hard structures supporting the teeth. (American Academy of Periodontology, n.d)

"Peri" means around and "odontal" refers to teeth. Periodontal diseases are infections of the structures around the teeth. These include the gums, the cementum that covers the root, the periodontal ligament and the alveolar bone. (Colgate, 2013)

A bacterial infection destroys the attachment fibers and supporting bones holding the teeth in the mouth. Left untreated, periodontal disease can lead to tooth loss. (Medicine net.com, 2016)

Periodontal disease is also known as Gum disease. It is one of the major causes of tooth loss in adults. As gum disease is usually painless, a person may not know to have it. It is caused by plaque. Plaque is the sticky film of bacteria that is constantly forming on our teeth. (American Dental Association, n.d)

## 1.2 Anatomy of a tooth: (Hoffman, 2009)

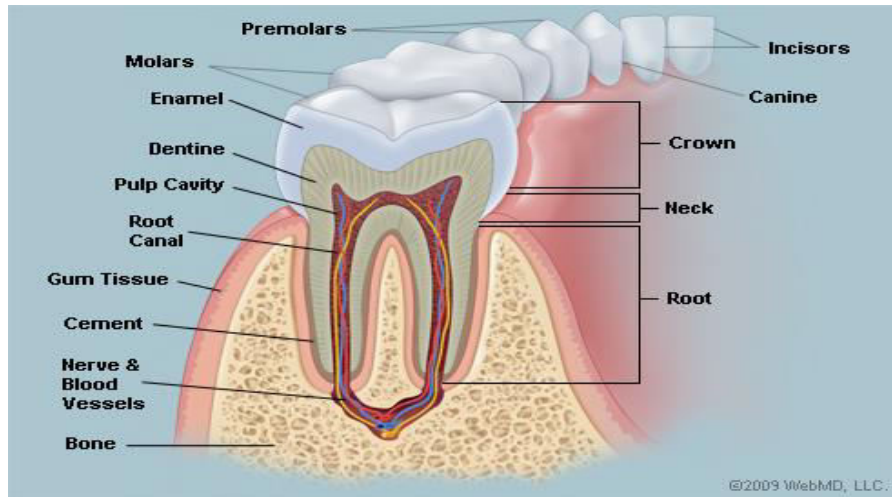
A tooth has two anatomical parts:

- **The crown:**

This part of the tooth is covered with enamel and is usually visible in the mouth.

- **The root:**

This part is embedded in the jaw. It anchors the tooth in its bony socket and is normally invisible.



**Figure 1.1:** Anatomy of a tooth (Hoffman, 2009)

### 1.2.1 Structure of a tooth: (Hoffman, 2009)

- **Enamel:**

The hard outer layer of the crown is called enamel. This is the hardest substance in the body.

- **Dentine:**

Dentine is not as hard as enamel. It forms the bulk of the tooth and can be sensitive if the protection of the enamel is lost.

- **Pulp:**

**Pulp is the** soft tissue containing the blood and nerve supply to the tooth. This part extends from the crown to the tip of the root.

- **Cementum:**

This layer of bone-like tissue covers the root. Cementum is not as hard as enamel.

### 1.2.2 Structures around the tooth: (Hoffman, 2009)

- **Periodontal ligament:**

This part is made up of thousands of fibres which fasten the cementum to the bony socket. These fibres anchor the tooth to the jaw bone and act as shock absorbers for the tooth that is subjected to heavy forces during chewing.

- **Oral Mucosa:** This is the moist tissue that lines the mouth.

- **Gingivae (gums):**

This is the soft tissue that immediately surrounds the teeth and bone and protects the bone and the roots of the teeth. It also provides an easily lubricated surface.

- **Bone:** Bone provides a socket in order to surround and support the roots of the teeth.

- **Nerves and blood supply:**

Each tooth and periodontal ligament has a nerve supply and the teeth are sensitive to a wide variety of stimuli. The blood supply is necessary to maintain the vitality of the tooth.

### 1.3 Warning signs that signal a problem: (American Dental Association, n.d)

- Gums that bleed easily
- Red, swollen and tender gums
- Gums that have pulled away from the teeth
- Persistent bad breath or bad taste
- Permanent teeth that are loose or separating
- Any change in the way the teeth fit together when bite (malocclusion)
- Any change in the fit of partial dentures
- Pus between teeth and gums
- Pain when chewing
- Sensitive teeth

#### **1.4 Factors involved in increasing gum disease:** (American Dental Association, n.d)

- Poor oral hygiene
- Smoking or chewing tobacco
- Genetics
- Crooked teeth which are hard to keep clean
- Pregnancy
- Diabetes
- Broken Fillings
- Compromised immunity such as HIV/AIDS patients
- Medications which include steroids (e.g. prednisolone, nandrolone, oxandrolone etc.), certain types of anti-epilepsy drugs (e.g. acetazolamide, carbamazepine, clonazepam etc.), cancer therapy drugs (e.g. cisplatin, cladribine etc.), some calcium channel blockers (e.g. amlodipine, nifedipine, diltiazem etc.) and oral contraceptives (e.g. estradiol, estrogen, progestin etc.)

#### **1.5 Association of gum disease with other diseases:** (Colgate, 2013)

- **Atherosclerosis and heart disease** — Gum disease may increase the risk of clogged arteries and heart disease. It is also believed to worsen existing heart disease.
- **Stroke** — Gum disease may increase the risk of the type of stroke which is caused by blocked arteries.
- **Premature births** — A woman who has gum disease during pregnancy may be more likely to deliver her baby too early. The infant may be more likely to be of low birth weight.
- **Diabetes** — Diabetic patients with periodontal disease may have more trouble in controlling their blood sugar than diabetic patients with healthy gums.
- **Respiratory disease** — Bacteria involved in gum disease may cause lung infections or worsen existing lung conditions. This is especially important for elderly adults in institutions

such as nursing homes. In this group, bacteria from the mouth may reach the lungs and may cause severe pneumonia.

## **1.6 Types of gum disease:**

There are two general classes of periodontal disease based on whether there is attachment or bone loss.

These are:

- Gingivitis
- Periodontitis (Gu & Ryan, 2010)

### **1.6.1 Gingivitis:**

Gingivitis is the mildest form of periodontal disease which causes the gums to become red, swollen and bleeds easily. There is normally little or no discomfort at this stage. It is often caused by inadequate oral hygiene and is reversible with professional treatment and good oral home care. (Gu & Ryan, 2010)

#### **1.6.1.1 Factors of gingival disease:**

Factors responsible for causing gingival disease are- diabetes, smoking, aging, genetic predisposition, systemic diseases and conditions, stress, inadequate nutrition, puberty, hormonal fluctuations, pregnancy, substance abuse, HIV infection, and certain medication use. (Gu & Ryan, 2010)



**Figure 1.2:** Upper Jaw Acute Gingivitis ([Researchgate](#), n.d)

### **1.6.1.2 Types of gingival disease:**

There are mainly two general categories of gingival disease:

- Dental plaque-induced gingival disease
- Non plaque-induced gingival lesions

#### **Dental plaque-induced gingival disease:**

One of the major reasons for gingivitis is plaque formation and calculus accumulation. Gingivitis may not lead to periodontitis; it may occur on teeth with no attachment loss or as a result of previously treated periodontitis.

Gingivitis may be initiated by the local accumulation of bacteria which is adjacent to the tooth. The epithelial and connective cells are stimulated by the bacterial antigens and their metabolic products. Because of this stimulation, inflammatory mediators are produced which result in a localized inflammatory response by recruiting polymorphonuclear leukocytes or neutrophils to the site. An antibody response is occurred and inflammation is produced due to the presence of inflammatory cells at the site. This plaque host interaction may be altered by local and systemic factors.

The signs of gingivitis include bleeding, redness and swelling of gums.

#### **Systemic factors:**

- Systemic hormonal changes which are associated with menstrual cycle, puberty or pregnancy
- Chronic diseases like diabetes has the ability to alter host response to dental plaque
- Certain hormonal changes can upregulate the immunoresponse resulting severe gingivitis
- Leukemia can cause the alteration of immune response by decreasing the normal immunological function.

### **1.6.1.3 Medications affecting gingivitis:**

The following drugs are responsible for severe gingival enlargement and pseudo-periodontal pocketing that is, the increase of probing depth with no associated attachment or bone loss-

- Anticonvulsant drugs
- Immunosuppressive drugs (cyclosporine)
- Ca Channel Blocker (Diltiazem)

### **1.6.1.4 Malnutrition:**

Due to the development of malnutrition, the host immune system can be diminished. This results in excessive gingival inflammation. Because of the scarcity of Ascorbic acid (Vitamin C), bright red, swollen and bleeding from gingival tissues can be produced.

This condition can be reversed by the treatment with Vitamin C.

### **1.6.1.5 Non plaque-induced gingival lesions:**

These are usually rare and results from systemic conditions. These lesions are caused by Bacteria, viruses, or fungi. Sexually transmitted diseases such as and syphilis may cause lesions in the periodontium tissues.

Primary streptococcal gingivitis is an acute inflammation of the oral mucosa which is associated with pain, fever, red swollen gingival tissues with bleeding or abscess formation. This condition may be treated with periodontal scaling and root planning in addition to antibiotic therapy.

(Gu & Ryan, 2008)

### **1.6.1.6 Diagnosis of gingivitis: (Healthline, 2015)**

During a dental exam, gums will be probed with a small ruler. This probing is a way to check for inflammation. It also measures any pockets around teeth. Normal depth is 1 to 3 millimeters. For checking bone loss, X-rays are ordered.

### **1.6.1.7 Cleaning Teeth:**

There are several techniques which can be used to deep clean teeth without surgery. They all remove plaque and tartar to prevent gum irritation.

**Scaling:** It removes tartar from above and below the gum line.

**Root planning:** It smoothes rough spots and removes infected tooth parts.

**Lasers:** This may remove tartar with less pain and bleeding than scaling and root planing.

### **1.6.1.8 Medications:**

A number of medications can be used to treat gingivitis:

**Antibiotic mouthwash:** It contains chlorhexidine and can be used to disinfect the mouth.

**Time-release antiseptic chips:** They contain chlorhexidine and can be inserted into pockets after root planing.

**Antibiotic microspheres:** They are made with minocycline and can be inserted in pockets after scaling and planing.

**Oral antibiotics:** These can be used to treat persistent areas of gum inflammation.

**Doxycycline:** It is an antibiotic. It can help keep enzymes from causing tooth damage.

### **Surgery:**

**Flap surgery:** It is a procedure where the gums are lifted back while plaque is removed. Then the gums are sutured in place to fit snugly around the tooth.

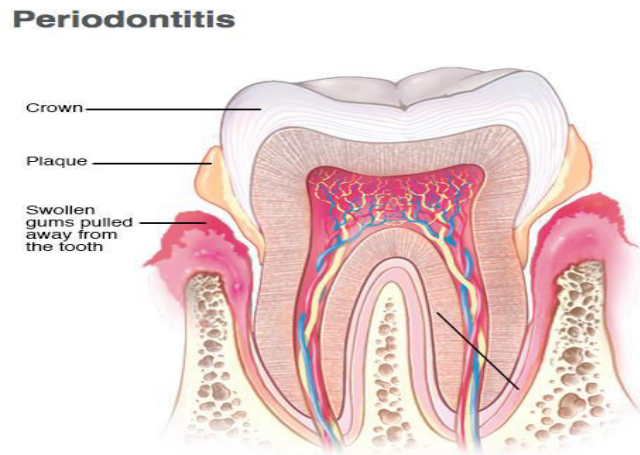
**Bone and tissue grafts:** These can be used where the teeth and jaw are too damaged to heal.

(American Academy of Periodontology, n.d)



## 1.6.2 Periodontitis:

Untreated gingivitis can lead to periodontitis. With time, plaque can spread and grow below the gum line. Toxins produced by the bacteria in plaque can irritate the gums. The toxins stimulate a chronic inflammatory response in which the body in essence turns on itself and the tissues and bone that support the teeth are broken down and destroyed.



**Figure 1.3:** Periodontitis (Mayo Clinic, 2014)

Gums separate from the teeth, forming pockets (spaces between the teeth and gums) that become infected. As the disease progresses, the pockets deepen and more gum tissue and bone are destroyed. Often, this destructive process has very mild symptoms. Eventually, teeth can become loose and may have to be removed.



**Figure 1.4:** Extent of Periodontitis (Researchgate, n.d)

### **1.6.2.1 Symptoms of Periodontitis:**

- ❖ Swollen gums
- ❖ Bright red or purplish gums
- ❖ Gums that felt tender while touched
- ❖ Gums that pull away from teeth (recede), making teeth looked longer than normal
- ❖ New spaces developing between teeth
- ❖ Pus between teeth and gums
- ❖ Bad breath
- ❖ Bad taste in the mouth
- ❖ Loose teeth
- ❖ A change in the way the teeth fit together during biting (Mayo Clinic, 2014)

### **1.6.2.2 Types of Periodontitis:**

There are many forms of periodontitis. The most common ones include the following:

#### **Aggressive periodontitis:**

It occurs in patients who are otherwise clinically healthy. Common features include rapid attachment loss and bone destruction and familial aggregation. Two types of acute periodontitis are seen. One is localized and the other is generalized. (Plancak, Jorgic-Srdjak & Curilovic, 2001)

#### **Chronic periodontitis:**

It results in inflammation within the supporting tissues of the teeth, progressive attachment and bone loss. This is the most frequently occurring form of periodontitis and is characterized by pocket formation and/or recession of the gingiva. It is prevalent in adults, but can occur at any age. Progression of attachment loss usually occurs slowly, but periods of rapid progression can occur. Localized and generalized are two types of chronic periodontitis.



**Figure 1.5:** Chronic and Aggressive periodontitis (Journal of Periodontal and Implant Science, 2011)

#### **Periodontitis as a manifestation of systemic diseases:**

This disease often begins at a young age. Systemic conditions such as heart disease, respiratory disease, and diabetes are associated with this form of periodontitis.

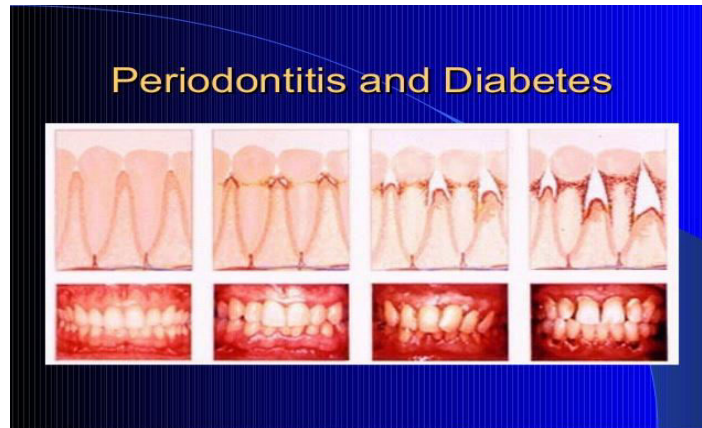
This can be classified as:

##### **❖ Connection with Blood diseases:**

- ✓ Acquired Neutropenia
- ✓ Leukaemia
- ✓ Others

##### **❖ Connection with Genetic Disorders:**

- ✓ Family or cyclic neutropenia
- ✓ Hypophosphatasia
- ✓ Cohen's syndrome
- ✓ Glycogen Storage Syndrome
- ✓ Infantile Genetic Agranulocytosis
- ✓ Histiocytosis or Eosinophilic Granuloma Syndrome
- ✓ Down's Syndrome
- ✓ Leukocyte Adhesive Deficiency Syndrome (Plancak, Jorgic-Srdjak & Curilovic, 2001)



**Figure 1.6:** Periodontitis in Diabetic Patient (Reddy, 2013)

**Necrotizing periodontal disease** is an infection characterized by necrosis of gingival tissues, periodontal ligament and alveolar bone. These lesions are most commonly observed in individuals with systemic conditions such as HIV infection, malnutrition and immunosuppression.



**Figure 1.7:** Necrotizing periodontal disease (Shady, n.d)

### **1.6.2.3 Risks and Prevention:** (Colgate, 2013)

The bacteria in plaque are the main cause of periodontal disease. But several other factors also associated with this. These include other diseases, medicines and oral habits. These factors can increase the risk of gum disease or make it worse once the infection has set in.

- **Genes** — Some people are more likely than others to get periodontal disease due to their genes. But genes do not make gum disease inevitable. People who are highly prone to periodontal disease can prevent or control the disease with good oral care.
- **Smoking and tobacco use** — Smoking increases the risk of periodontal disease. The longer one smoke and the more he/she smokes, the higher the risk. If a person has periodontal disease, smoking makes it more severe. Smoking is a major reason that some cases of periodontal disease are resistant to treatment. Smokers tend to collect more tartar on their teeth. Once they have gum disease, they often develop deeper periodontal pockets. They are likely to lose more bone as the disease gets worse. Unlike many other factors that affect the health of your gums, the decision to smoke or not is under your control. Quitting smoking can play a major role in bringing periodontal disease under control.
- **Misaligned or crowded teeth, braces or bridgework** — Anything that makes it more difficult to brush or floss the teeth is likely to increase plaque and tartar formation. The more plaque and tartar one has, the greater the chance of developing gum disease. Dentists and periodontists can show you the best ways to clean teeth, even if they are hard to clean. For example, a person can use special tools and ways of threading floss to clean around bridgework or slide under braces. If overcrowded or crooked teeth are a problem, dentists might recommend orthodontics. This could give a better chance of preventing disease.
- **Grinding, gritting or clenching of teeth** — These habits won't cause periodontal disease. They can lead to more severe disease if gums are already inflamed. These habits exert excess force on teeth. This pressure appears to speed up the breakdown of the periodontal ligament and bone. In many cases, people can learn to stop this habit simply by recognizing when it is happening and then relaxing. If these efforts don't work, dentists or periodontists can create a custom guard appliance to help reduce the pressure of clenching or grinding on the teeth. This device is also called an occlusal guard, night guard, mouth guard or bite guard.

- **Stress** — Stress can make periodontal disease worse and harder to treat. Stress weakens body's immune system. This makes it harder for the body to fight off infection, including periodontal disease.
- **Fluctuating hormones** — Changes can occur in the mouth when hormone levels go up and down in the body. Puberty and pregnancy can temporarily increase the risk and severity of gum disease. So can menopause.
- **Medicines** — Several types of medicines can cause dry mouth, or xerostomia such as certain drugs for depression and high blood pressure. If a person does not have enough saliva, plaque is more likely to form. This may lead to tooth decay (cavities). Other medicines may cause the gums to enlarge. This makes them more likely to trap plaque.

### **These medicines include:**

- Phenytoin - used to control seizures
- Cyclosporine - used to suppress the immune system in people who have had organ transplants
- Nifedipine and other calcium channel blockers - used to treat high blood pressure, chest pain (angina) or heart arrhythmias.
- **Diseases** — People with certain diseases have a higher risk of developing periodontal disease. For example, people with diabetes are more likely to get periodontitis than people without diabetes. Their gum disease is also likely to be more severe. Other diseases that increase periodontal disease risk include inflammatory conditions such as rheumatoid arthritis and HIV infection. Having one of these diseases can make the control of periodontal disease more difficult. But a good periodontist or dentist who is aware of these problems can give the guidance on how to maintain periodontal health.
- **Poor nutrition** — Nutrition is important for overall good health, including a working immune system and healthy gums and mouth. Severe vitamin C deficiency (scurvy) can cause bleeding gums.

### 1.6.2.4 Diagnosis of Periodontitis:

❖ **Use of a dental instrument to measure the pocket depth:**

The pocket depth is between 1 and 3 mm in a healthy mouth. The pocket depth deeper than 5mm is an indication of periodontitis.

❖ **Dental X-rays:**

This is done to see the bone loss in deeper pocket. (Mayo Clinic, 2014)

### 1.6.2.5 Treatment of Periodontitis:

Treatment can be categorized into-

❖ Non surgical treatment

❖ Surgical Treatment

#### **Non Surgical Treatment:**

✚ **Scaling:**

It removes tartar and bacteria by using instruments or an ultrasonic device.

✚ **Root Planing:**

This smoothes the root surfaces by preventing tartar and bacterial endotoxin.

✚ **Antibiotics:**

Topical or oral antibiotics are used to help control bacterial infection. Topical antibiotics include antibiotic mouth rinses or insertion of gels which contains antibiotics in the space teeth and gums or into pockets after deep cleaning. Oral antibiotics are also necessary to eliminate infection-causing bacteria completely.

## **Surgical Treatment:**

In case of advanced periodontitis, the gum tissue may not respond to nonsurgical treatments. In that case, periodontitis should be treated by dental surgery, such as:

### **❖ Flap surgery or pocket reduction surgery:**

In this procedure, tiny incisions are made in the gum so that a section of gum tissue can be lifted back. This exposes the roots for more effective scaling and root planing. As periodontitis is often associated with bone loss, the underlying bone may be recontoured before the gum tissue is sutured back in place. After healing, it is easier to clean these areas and maintain healthy gum tissue.

### **❖ Soft tissue grafts:**

Because of losing gum tissue in periodontal disease, the gumline recedes. Some of the damaged soft tissue may need to be reinforced. This can be done by removing a small amount of tissue from the roof of the mouth or another donor source and then it is attached to the affected site. This procedure can help reduce further gum recession, cover exposed roots and give the teeth a more pleasing appearance.

### **❖ Bone grafting:**

This procedure is performed when the bone surrounding the tooth root has been damaged. The graft is composed of small fragments of the patient's own bone or the bone can be synthetic or donated. The bone graft prevents tooth loss by holding the tooth in place. It also acts as a platform for the re-growth of natural bone.

### **❖ Guided tissue regeneration:**

The bone that was destroyed by bacteria is allowed to re-growth by this technique. A special piece of biocompatible fabric is placed between existing bone and the tooth. The material prevents unwanted tissue from entering the healing area which allows the bone to grow back instead.



❖ **Enamel matrix derivative application:**

This technique is to apply a special gel to a diseased tooth root which contains the same proteins responsible for developing tooth enamel and stimulating the growth of healthy bone and tissue. (Mayo Clinic, 2014)

**1.6.2.6 Effect of Lifestyles in preventing Periodontitis:**

To prevent periodontitis and keep a healthy gum, the following steps should be taken:

- ✓ Regular professional dental cleanings
- ✓ Using a soft toothbrush and replacing it at least every three to four months.
- ✓ An electric toothbrush should be used as it is more effective at removing plaque and tartar.
- ✓ Brushing teeth twice a day or after every meal or snack.
- ✓ Floss daily
- ✓ Using a mouth rinse which helps reduce plaque between teeth.
- ✓ Supplement brushing and flossing by an interdental cleaner such as a dental pick to clean between teeth (Mayo Clinic, 2014)

**1.7 Differences between Gingivitis and Periodontitis:**

The symptoms of gingivitis can sometimes be ignored but periodontitis is the most severe form. Gingivitis is considered as the primary step of developing periodontitis.

**Table 1.1: Differences between Gingivitis and Periodontitis**

<b>Gingivitis</b>	<b>Periodontitis</b>
It is the first stage of gum disease	It is the second stage of gum disease
It refers to inflammation of a gum which results from an excess of plaque on the teeth.	Severe gingivitis can lead to periodontitis

<b>Gingivitis</b>	<b>Periodontitis</b>
Signs include: red, swollen gums or gums that bleed easily	Signs include: gums tissue pulls away from the teeth that creates pockets and helps form additional bacteria; painful chewing; loose teeth
Sometimes the symptoms of gingivitis cannot be noticed	The symptoms cannot be ignored

(KenCaryl Dental Center, 2016)

**1.8 Treatment of gum disease:** (National Institute of Dental and Craniofacial Research, 2014)

The main goal of treatment is to control the infection. The number and types of treatment varies depending on the extent of the gum disease. The doctor may suggest changing certain behaviors, such as quitting smoking, as a way to improve treatment outcome.

**1.8.1 Deep Cleaning (Scaling and Root Planing):**

The dentist, periodontist, or dental hygienist removes the plaque through a deep-cleaning method called **scaling** and **root planing**.

**Scaling** means scraping off the tartar from the above and below of gum line.

**Root planing** gets rid of rough spots on the tooth root where the germs gather and helps remove bacteria which contribute to the disease. In some cases a laser may be used to remove plaque and tartar. This procedure can result in less bleeding, swelling, and discomfort compared to traditional deep cleaning methods. (National Institute of Dental and Craniofacial Research, 2014)

**1.8.2 Medications:** (National Institute of Dental and Craniofacial Research, 2014)

Medications may be used with treatment that includes scaling and root planning, but they cannot always take the place of surgery. Depending on how far the disease has progressed, the dentist or periodontist may still suggest surgical treatment.

**Table 1.2: Medications used in the treatment of periodontal disease**

Medications	Definition	Uses	How to use
<b>Prescription antimicrobial mouthrinse</b>	A prescription mouthrinse containing an antimicrobial called chlorhexidine	To control bacteria when treating gingivitis and after gum surgery	It is used like a regular mouthwash.
<b>Antiseptic chip</b>	A tiny piece of gelatin filled with the medicine chlorhexidine	To control bacteria and reduce the size of periodontal pockets	After root planing, it is placed in the pockets where the medicine is slowly released over time.
<b>Antibiotic gel</b>	A gel that contains the antibiotic doxycycline	To control bacteria and reduce the size of periodontal pockets	The periodontist puts it in the pockets after scaling and root planing. The antibiotic is released slowly over a period of about seven days.
<b>Antibiotic microspheres</b>	Tiny, round particles that contain the antibiotic minocycline	To control bacteria and reduce the size of periodontal pockets	The periodontist puts the microspheres into the pockets after scaling and root planing. The particles release minocycline slowly over time.
<b>Enzyme suppressant</b>	A low dose of the medication doxycycline that keeps destructive enzymes in check	To hold back the body's enzyme response — If not controlled, certain enzymes can break down gum tissue	This medication is in tablet form. It is used in combination with scaling and root planing.

Medications	Definition	Uses	How to use
<b>Oral antibiotics</b>	Antibiotic tablets or capsules	For the short term treatment of an acute or locally persistent periodontal infection	These come as tablets or capsules and are taken by mouth.

### **1.8.3 Surgical Treatments:** (National Institute of Dental and Craniofacial Research, 2014)

#### **Flap Surgery:**

Surgery may be necessary if inflammation and deep pockets remain following treatment with deep cleaning and medications. A dentist or periodontist may perform flap surgery in order to remove tartar deposits in deep pockets or to reduce the periodontal pocket and make it easier for the patient, dentist, and hygienist to keep the area clean. This common surgery involves lifting back the gums and removing the tartar. The gums are then sutured back in place so that the tissue fits snugly around the tooth again. After surgery, the gums will heal and fit more tightly around the tooth. This sometimes results in the teeth appearing longer.

#### **Bone and Tissue Grafts:**

In addition to flap surgery, another procedure may be suggested to help regenerate any bone or gum tissue lost to periodontitis. Bone grafting, in which natural or synthetic bone is placed in the area of bone loss can help promote bone growth. A technique which can be used with bone grafting is called guided tissue regeneration. In this procedure, a small piece of mesh-like material is inserted between the bone and gum tissue. This keeps the gum tissue from growing into the area allowing the bone and connective tissue to regrow. Growth factors can be used to help body naturally regrow bone. In cases where gum tissue has been lost, a soft tissue graft is suggested in which synthetic material or tissue taken from another area of the mouth is used to cover exposed tooth roots.

Since each case is different, it is not possible to predict with certainty which grafts will be successful over the long-term.

Treatment results depend on many things, including

- how far the disease has progressed
- how well the patient keeps up with oral care at home and
- Certain risk factors, such as smoking, which may lower the chances of success.

### **1.9 Maintaining of healthy teeth and gums:**

- Brush teeth twice a day (with a fluoride toothpaste). Floss regularly to remove plaque which is formed between teeth or use of a device such as a special brush or wooden or plastic pick recommended by a dental professional
- Visit the dentist routinely for a check-up and professional cleaning.
- Avoid smoking

### **1.10 Association of gum disease with other health problems beyond the mouth:**

- In some studies, researchers have observed that people with gum disease (when compared to people without gum disease) were more likely to develop heart disease or have difficulty controlling blood sugar.
- Other studies showed that women with gum disease were more likely than those with healthy gums to deliver preterm, low birth weight babies. But it has not been determined whether gum disease is the cause of these conditions.
- There may be other reasons people with gum disease sometimes develop additional health problems. For example, something else may be causing both the gum disease and the other condition, or it could be a coincidence that gum disease and other health problems are present together.

- More research is needed to clarify whether gum disease actually causes health problems beyond the mouth and whether treating gum disease can keep other health conditions from developing. (National Institute of Dental and Craniofacial Research, 2014)

# **Chapter Two**

## **Aim and Objective**

Periodontal disease is one of the most common diseases in Bangladesh. Now-a-days, this problem is more prominent not only in adults but also in children.

This survey is done over a population of various age ranges to see the common treatment pattern of dentist of Bangladesh.

The main objectives of this survey are:

- To evaluate the common risk factors associated with periodontal disease.
- To find out the common treatment pattern of periodontal disease in Bangladesh
- To find out the signs & symptoms of periodontal disease.
- To find out which types of drugs are frequently used in periodontal disease
- To evaluate the prescription pattern of different dentists of Bangladesh.
- To analyze the behavioral impact of people on their oral health
- To evaluate the doctor-visit frequency of people regarding dental health



# **Chapter Three**

## **Literature Review**

Grossi & Genco (1998) concluded that there is an association of severe periodontal disease with severe diabetes mellitus. Diabetes is a risk factor for severe periodontal disease. They proposed that an upregulation cycle of cytokine synthesis and secretion by chronic stimulus from lipopolysaccharide (LPS) due to infection and products of periodontopathic organisms may have the ability to amplify the magnitude of the Advanced Glycation End product (AGE)-mediated cytokine response operative in diabetes mellitus. In that model, the combination of infection and AGE-mediated cytokine upregulation, helps explain the increase in tissue destruction seen in diabetic periodontitis and how periodontal infection may complicate the severity of diabetes and the degree of metabolic control. That results in a 2-way relationship between diabetes mellitus and periodontal disease/infection. That proposed dual pathway of tissue destruction suggests that control of chronic periodontal infection is essential in order to achieve long-term control of diabetes mellitus. Evidence was presented for supporting the hypothesis that elimination of periodontal infection by using systemic antibiotics improved metabolic control of diabetes and that may be defined by the reduction in glycated hemoglobin or reduction in insulin requirements. (Grossi & Genco 1998)

Casanova, Hughes & Preshaw (2014) concluded that Periodontitis and diabetes are common, complex, chronic diseases having bidirectional relationship. If glycaemic control is poor, Diabetes is associated with an increased prevalence and severity of periodontitis and there is an association of severe periodontitis with compromised glycaemic control. Periodontal treatment, especially, conventional non-surgical periodontal therapy has been associated with the improvements in glycaemic control in diabetic patients and with reductions in HbA1c of approximately 0.4% following periodontal therapy. For these reasons, management of periodontitis in diabetic patients is important. Therefore the dental team has an important role to play in the management of diabetic patients. Diabetes screening tools could be used by Dental professionals in order to identify patients at high risk of diabetes, to enable them to seek further investigation and assessment from medical healthcare providers. (Casanova, Hughes & Preshaw 2014)

AlJehani (2014) reviewed a paper which had an aim to show the evidence on the potential roles of modifiable and nonmodifiable risk factors associated with periodontal disease. He concluded that understanding the etiological factors and the pathogenesis of periodontal disease is important to

recognize and appreciate the associated risk factors. Effective disease management requires a clear understanding of all the associated risk factors due to the multifactorial property of periodontal disease. (AlJehani 2014)

Fowler, Breault & Cuenin (2001) concluded that initially, it was thought that diabetes and systemic diseases have unidirectional relationship but later, the relationship was proven as bidirectional. From a case control and cross sectional study, it was indicated that due to periodontitis, there was 7-fold increases in risk for preterm low birth weight infants and 2-fold increases in risk for cardiovascular diseases. Periodontal disease had the involvement with both local and systemic inflammatory response. (Fowler, Breault & Cuenin 2001)

Wu *et al*, (2000) concluded that periodontitis is a significant risk factor for total CerebroVascular Accidents (CVAs) and nonhemorrhagic stroke. Compared with no periodontal disease, the relative risks (95% confidence intervals) for incident nonhemorrhagic stroke were 1.24 (0.74-2.08) for gingivitis, 2.11 (1.30-3.42) for periodontitis, and 1.41 (0.96-2.06) for edentulousness. For total CVAs, the results were 1.02 (0.70-1.48) for gingivitis, 1.66 (1.15-2.39) for periodontitis, and 1.23 (0.91-1.66) for edentulousness. Increased relative risks for total CVA and nonhemorrhagic stroke were associated with periodontitis and were also seen in white men, white women and African Americans. The similar results were found for fatal CVAs also. They also concluded that the Role of infection in the etiology of atherosclerosis and the development of cardiovascular disease have recently received considerable attention. Periodontal disease is one of the most common human infections which have been found to be a risk factor for coronary heart disease in a number of studies. The association between periodontal disease and the risk for CerebroVascular Accidents (CVAs) is much less studied. The purpose of that study was to examine the association between baseline periodontal status and subsequent incidence and mortality of CVA in a representative sample of US adults. (Wu *et al*, 2000)

According to Darnaud (2015), in the sample of subject  $\geq 65$  years, there was no significant association was found between oral variables and the risk of hypertension. But in subject  $< 65$  years, oral variables and risk of hypertension were associated with each other. Insufficient chewing and missing teeth ( $> 10$ ) showed odds ratio (OR) = 1.20 [95% CI = 1.08–1.32] and OR=

1.17 [95% CI = 1.04–1.31] respectively. There was association of Hypertension with high level of dental plaque [OR = 1.90, 95% CI = 1.55– 2.33], dental calculus [OR = 1.18, 95% CI = 1.07– 1.29] and gingival inflammation [OR = 1.56, 95% CI = 1.35–1.80]. Moreover, in that subject <65 years, the risk of hypertension increases according to the number of dental exposure. The present study indicates that insufficient mastication, poor oral hygiene and oral inflammation are also associated with hypertension in subject <65 years. (Darnaoud 2015)

DeStefano *et al*, (1993) resulted that among all 9760 subjects; those with periodontitis had a 25% increased risk of coronary heart disease with relative to those having minimal periodontal disease. Poor oral hygiene which was determined by the extent of dental debris and calculus, associated with an increased incidence of coronary heart disease. In men younger than 50 years at baseline, periodontal disease was a stronger risk factor for coronary heart disease and men with periodontitis had a relative risk of 1.72. Both periodontal disease and poor oral hygiene were strongly associated with total mortality than with coronary heart disease. Particularly in young men, dental disease is associated with an increased risk of coronary heart disease. Whether this is a causal association is unclear. Dental health may more generally indicate personal hygiene and possibly health care practices. (DeStefano *et al*, 1993)

According to Beck *et al*, (2001), periodontitis has been linked to clinical cardiovascular disease but it is not linked to subclinical atherosclerosis. They conducted a Cross-sectional data on 6017 persons aged 52 to 75 years which were obtained from the Atherosclerosis Risk in Communities Study 1996 to 1998 examination. The dependent variable of that study was carotid Intima-media wall Thickness (IMT  $\geq 1$  mm). Periodontitis was defined by extent of attachment loss  $\geq 3$  mm: none/mild (<10%), moderate (10% to <30%) or severe ( $\geq 30\%$ ). Age, sex, diabetes, LDL cholesterol, HDL cholesterol, triglycerides, hypertension, smoking, waist-hip ratio, education, and race/study center are included in covariates. Odds of IMT  $\geq 1$  mm were higher for severe periodontitis (OR 2.09, 95% CI 1.73 to 2.53) and moderate periodontitis (OR 1.40, CI 1.17 to 1.67) in comparison to no periodontitis. In a multivariable logistic regression model, severe periodontitis (OR 1.31, CI 1.03 to 1.66) was associated with IMT 1 mm when other factors in the model were adjusted. These results provide the first indication that periodontitis may play a role in the pathogenesis of both atheroma formation and in cardiovascular events. (Beck *et al*, 2001)

Griffin *et al*, (2012) stated that in national data for older adults, racial or ethnic and income disparities has been shown in untreated dental disease and oral health–related quality of life. Persons lower oral health–related quality of life who report poor versus good health report. On the basis of those findings, they suggested public health priorities which include better integrating oral health into medical care, implementing community programs to promote healthy behaviors and improve access to preventive services, assessing the feasibility of ensuring a safety net that covers preventive and basic restorative services to eliminate pain and infection and developing a comprehensive strategy to address the oral health needs of the homebound and long-term-care residents. (Griffin *et al*, 2012)

Griffin *et al*, (2009) conducted a study where they found that the weighted mean RR was 0.998 (95 percent CI, 0.817–1.220) at one year after placement (345 tooth pairs in four studies) and 0.936 (95 percent CI, 0.896–0.978) at four years (1,423 tooth pairs in five studies). Teeth with fully or partially lost sealant were not at a higher risk of developing caries. But teeth which had never been sealed were at greater risk of developing caries. (Griffin *et al*, 2009)

A multicomponent approach to health promotion: the Chronic Disease Model has been adopted by the Centers for Disease Control and Prevention (CDC). This has some public health principles like the need to base program efforts on the best available science, the special responsibility of public health for at-risk populations, the need for population-based approaches etc. Such approaches require public health agencies to build programs that engage broad networks of partners, monitoring of diseases, risk factors, and behaviors; implementation of the proven prevention strategies and evaluation of the programs rigorously. In this report, emphasis is given on knowledge concerning the components of programs, measuring oral diseases and risk factors, and the effectiveness of preventive interventions at the clinical, self-care and community levels for dental caries and oral and pharyngeal cancers. (Gooch *et al*, 2005)

Dyke & Dave (2005) found that in recent years, the complexity of the pathogenesis of periodontal diseases is more than the presence of virulent microorganisms. This is now widely accepted that susceptibility to periodontitis varies greatly between individuals who harbor the same pathogenic microflora. There is huge evidence that points to the host response to bacterial challenge as a major determinant of susceptibility. In this review, they assess the data which

implicates various inherited and acquired risk factors for susceptibility to periodontal diseases. (Dyke & Dave 2005)

Ide *et al*, (2016) suggested that periodontitis is common in the elderly and may be more common in Alzheimer's disease due to a reduction in the ability to take care of oral hygiene as the disease progresses. Elevated antibodies to periodontal bacteria are associated with an increased systemic pro-inflammatory state and raised serum pro-inflammatory cytokines have been associated with an increased rate of cognitive decline in Alzheimer's disease. They conducted a six month observational study where 60 community dwelling participants with mild to moderate Alzheimer's Disease were cognitively assessed and a blood sample taken for systemic inflammatory markers. They found that the presence of periodontitis at baseline was not related to baseline cognitive state but it had an association with a six fold increase in the rate of cognitive decline as assessed by the study. Periodontitis at baseline had an association with a relative increase in the pro-inflammatory state over follow up period. Their data showed that there is an association of periodontitis is with increased cognitive decline in Alzheimer's Disease, independent to baseline cognitive state, which may be mediated through effects on systemic inflammation. (Ide *et al*, 2016)

Joshiyura *et al*, (2014) concluded that periodontal disease is a chronic infection of the gums which is characterized by a loss of attachment between the tooth and bone and by bone loss. They cross-sectionally evaluated that periodontal disease is associated with C-reactive protein (CRP), fibrinogen, factor VII, tissue plasminogen activator (t-PA) and soluble tumor necrosis factor receptors 1 and 2. The final sample consisted of 468 men (ages 47–80 yrs), were free of Cardiovascular disease, diabetes and cancer. In multivariate regression models controlling for age, cigarette smoking, alcohol intake, physical activity, and aspirin intake, it was reported that periodontal disease was associated with significantly 30% higher levels of CRP, 11% higher t-PA and 11% higher LDL-C. Their data showed that periodontal disease is significantly associated with biomarkers of endothelial dysfunction and dyslipidemia that may mediate the association between periodontal and cardiovascular disease potentially. (Joshiyura *et al*, 2014)

According to Sfyrocras *et al*, (2012), patients with both hemorrhagic and ischemic cerebrovascular events, fatal and nonfatal, were included. Most of their studies have been

adjusted for common cardiovascular risk factors. For the purpose of prospective and retrospective studies, separate statistical analysis was performed. Overall adjusted risk of stroke in subjects with periodontitis was 1.47 times higher than in subjects without (95% confidence interval, 1.13-1.92;  $P = .0035$ ) in prospective and 2.63 times (95% confidence interval, 1.59-4.33;  $P = .0002$ ) in retrospective studies. They concluded that there is evidence that showed the association of periodontitis with increased risk of stroke. (Sfyrocras *et al*, 2012)

In the study conducted by Yarmohammadi *et al*, (2015), 17 common systemic disease were identified such as Diabetes Mellitus, Female Sexual Hormones Condition, Hyperthyroidism, Primary Hyperparathyroidism, Hyperpituitarism, Osteoporosis, Erythromelalgia, Gorham's Disease, Sarcoidosis, Wegener's Granulomatosis, Burkitt, Lymphoma, Non Hodgkin Lymphoma, Hypophosphatasia, Hypophosphatemia, Acatlasia, Multiple Myeloma and Langerhans Cell Histiocytosis. By recognizing these common systemic diseases and links between doctors and dentists, it can limit or reduce the speed and extension of oral complication with fast and accurate oral health measures. (Yarmohammadi *et al*, 2015)

Derouen (2015) concluded that periodontal disease in patients who have at least one of five systemic conditions (type 2 diabetes, coronary artery disease, cerebral vascular disease, rheumatoid arthritis, and pregnancy), in addition to periodontitis, results in the reduction of subsequent health-related costs. (Derouen 2015)

Michalowicz *et al*, (2006) showed in a study that preterm birth (before 37 weeks of gestation) occurred in 49 of 407 women (12.0%) in the treatment group (resulting in 44 live births) and in 52 of 405 women (12.8%) in the control group (resulting in 38 live births). No significant differences were seen between the treatment and control groups in birth weight (3239 g vs. 3258 g,  $P=0.64$ ) or in the rate of delivery of infants which were small for gestational age (12.7% vs. 12.3%; odds ratio, 1.04; 95% CI, 0.68 to 1.58). There were 5 spontaneous abortions or stillbirths in the treatment group when compared with 14 in the control group ( $P=0.08$ ). Treatment of periodontitis in pregnant women can improve periodontal disease and is safe but rates of preterm birth, low birth weight, or fetal growth restriction are not significantly altered. (Michalowicz *et al*, 2006)

# **Chapter Four**

## **Method and Materials**



## 4.1 Method and Materials

Present study protocol

1. Number of study center : 06
2. Number of patients : 200
  - Male : 94
  - Female : 106
3. Site of study : Sipahibag, Tilpapara and Khilgaon Railgate area of Dhaka city
4. Duration of study : 1 year

### Inclusive Criteria:

Only outdoor patients were included in the study. The study was conducted in six Dental Health Care Centers of Sipahibag, Tilpapara and Khilgaon Railgate area of Dhaka city

### Study Design:

1. A total 200 patients enrolled in the study.
2. A data collection form was designed to collect patient's data including prescription.

## 4.2 Questionnaire for survey (Patient Interview)

1. Patient name:
2. Patient gender :         Female         Male
3. Patient age: \_\_\_\_ yrs
  - below 25                       26-40                       41-65                       above 65

### *Section A. Oral Health Related to Quality of Life*

4. During the last six weeks, have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?

Never       Occasionally       Often

5. During the last six weeks, have you had painful aching in your mouth?

Never       Occasionally       Often

6. During the last six weeks, have you any uncomfortable feeling of your teeth, mouth or dentures?

Never       Occasionally       Often

7. During the last six weeks, have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?

Never       Occasionally       Often

***Section B. Oral Hygiene and Dental Service Utilization***

8. How frequently did you BRUSH your teeth?

Once a day       twice a day       more than twice a day

9. How frequently did you FLOSS your teeth?

Once a day       twice a day       more than twice a day

10. How frequently did you use an Oral Rinse?

Once a day       twice a day       more than twice a day

11. Have you ever been diagnosed with gum disease?

Yes     No     Unknown

12. If yes, how old were you when you were first diagnosed? \_\_\_\_\_ Age (years)

13. How often did you visit the dentist?

- Once or more per year
- Every two years
- Less often than every two years
- Only when you have a problem

**Section C. Case History**

14. 20. Put a tick mark where appropriate:

- Do you smoke?                      Never/ sometimes/ occasionally/ often/ chain smoker
- Do you take betel leaf?            Never/ sometimes/ occasionally/ often
- Do you drink alcohol?            Never/ sometimes/ occasionally/ often
- Do you take tobacco?            Never/ sometimes/ occasionally/ often

15. Do you have?

- Bad breath that won't go away
- Red or swollen gums
- Tender or bleeding gums
- Painful chewing
- Loose teeth
- sensitive teeth

16. How often did you have a drink containing alcohol?

- Never
- Monthly or less
- 2-4 times a month
- 2-3 times per week
- 4 or more times per week

17. Do you have any tingling pain in the affected area?

Yes    No

18. Did you ever take any medicine to improve the condition?

Yes    No

19. If yes, what did you use? \_\_\_\_\_

20. Do you have jaw or tooth pain along with facial swelling, high fever, rigor, chills, a severe headache feeling faint?

Yes  No

21. Is the pain localized to only one tooth?

Yes  No (It is not just one tooth)

22. Does the one painful tooth have any redness or swelling around the gum?

Yes  No

### 4.3 Prescription Sample:

Various prescriptions were collected from the study centers. Among those prescriptions, two are attached as a sample.

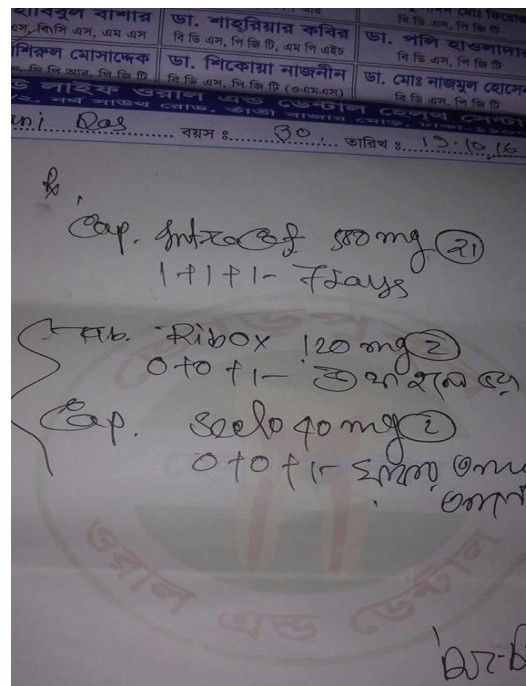
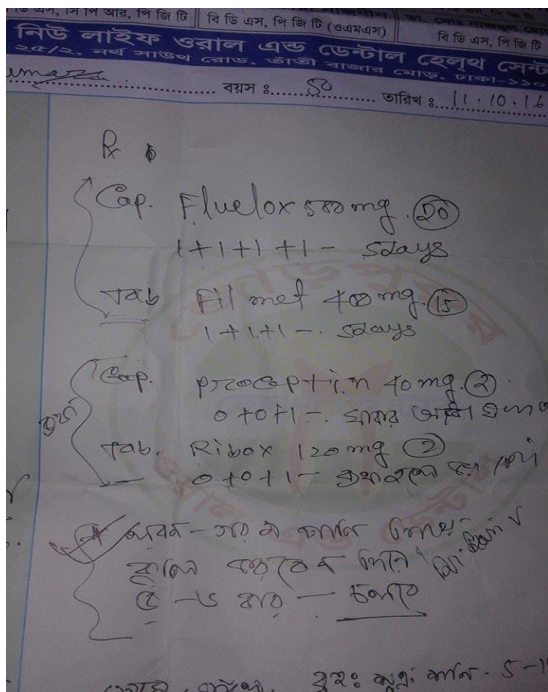


Figure 4.7: Prescription Sample

# **Chapter Five**

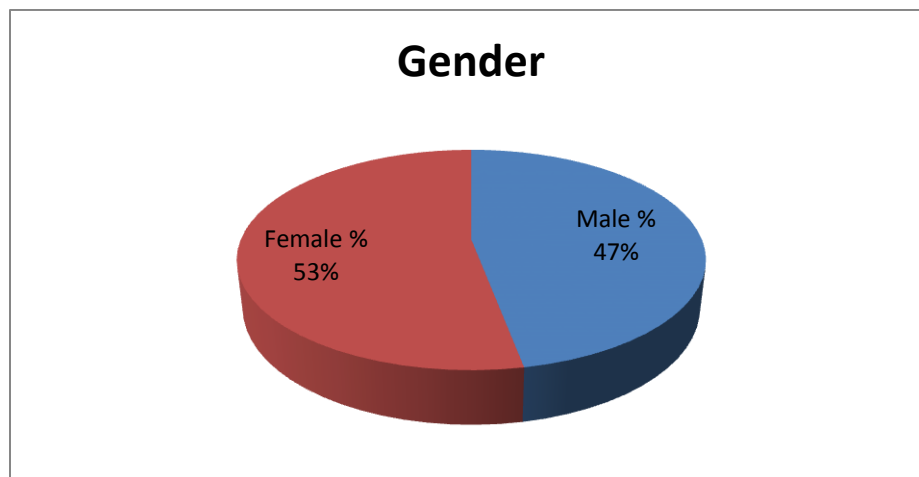
## **Result**

The following criteria are assessed and analyzed.

### 5.1: Gender Distribution of participants

**Table 5.1: Gender Distribution**

Gender	Number (n=200)	Percentage (%)
Male	94	47
Female	106	53



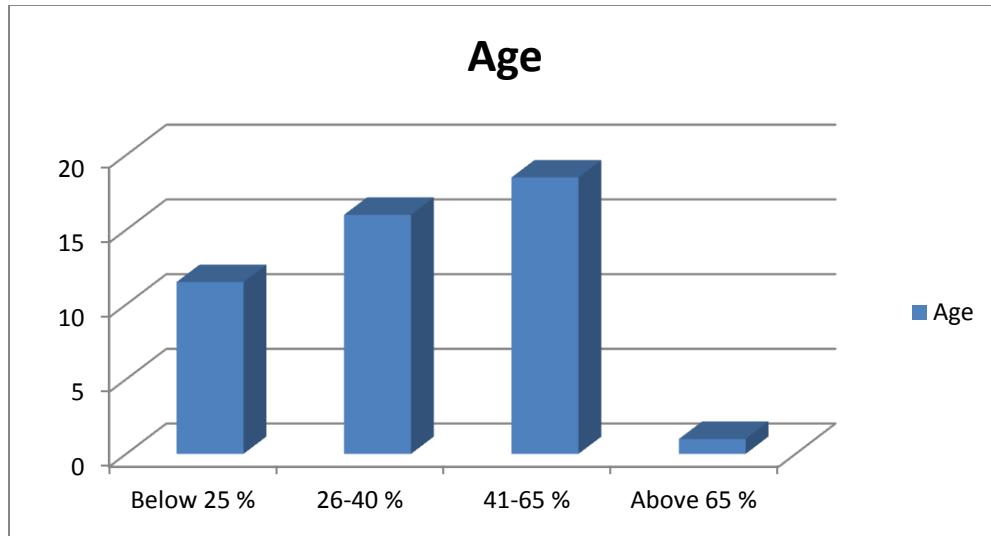
**Figure 5.1:** A pie chart showing the percentage of male and female among total participants

Among 200 participants, 47% were male and 53% were female.

### 5.2: Age Variation of tested Population

**Table 5.2: Age Variation**

Years	Number	Percentage (%)
Below 25	23	11.5
26-40	32	16
41-65	37	18.5
Above 65	2	1



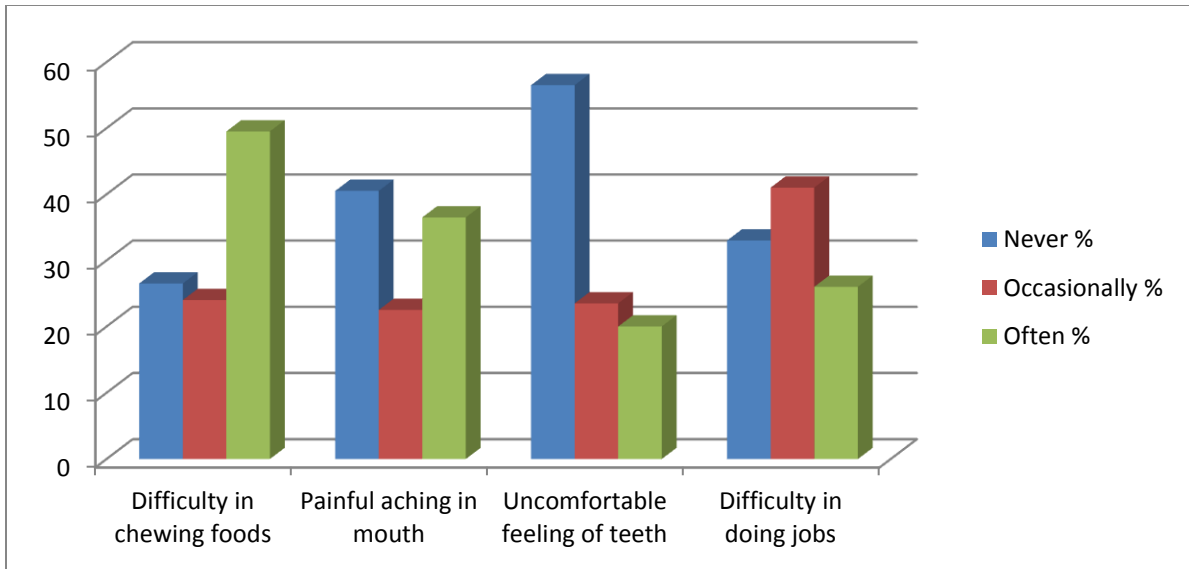
**Figure 5.2:** Age variation of tested Population

Among 200 participants, 11.5% were below 25 years, 16% were in the range of 26-40 years, 18.5% were in the range of 41-65 years and only 1% was for above 65 years.

### 5.3: Common problems in participants in case of periodontal disease

**Table 5.3: Common problems in participants**

	Never		Occasionally		Often	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Difficulty in chewing foods	53	26.5	48	24	99	49.5
Painful aching in mouth	81	40.5	45	22.5	73	36.5
Uncomfortable feeling of teeth	113	56.5	47	23.5	40	20
Difficulty in doing jobs	66	33	82	41	52	26

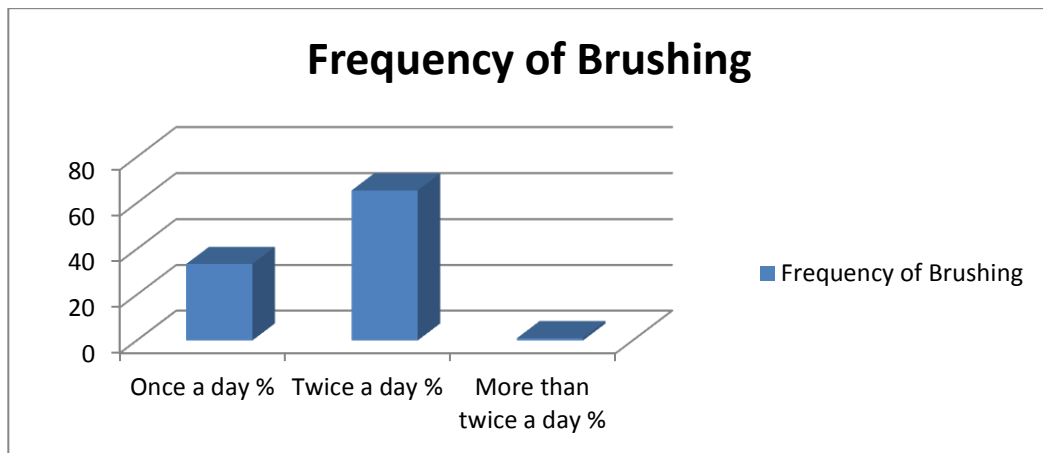


**Figure 5.3:** Common Problems in patients

#### 5.4: Frequency of brushing of people

**Table 5.4:** Frequency of Brushing

	Number	Percentage (%)
Once a day	67	33.5
Twice a day	131	65.5
More than twice a day	2	1



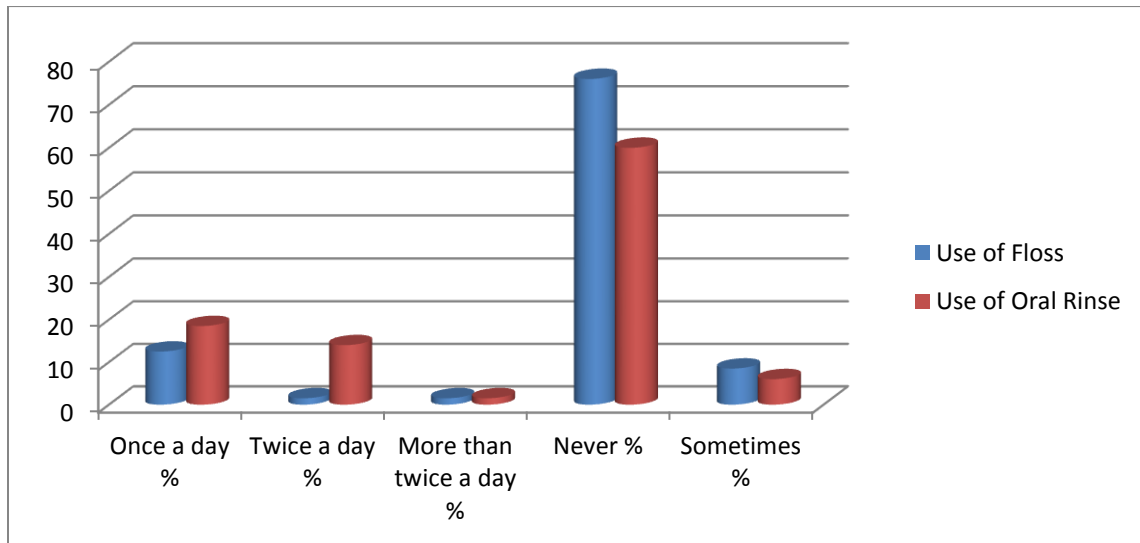
**Figure 5.4:** Frequency of brushing



## 5.5: Frequency of using Floss and Oral Rinse among tested population

**Table 5.5: Frequency of using Floss and Oral Rinse**

	Use of Floss		Use of Oral Rinse	
	Number	Percentage (%)	Number	Percentage (%)
Once a day	25	12.5	37	18.5
Twice a day	3	1.5	28	14
More than twice a day	3	1.5	3	1.5
Never	152	76	120	60
Sometimes	17	8.5	12	6

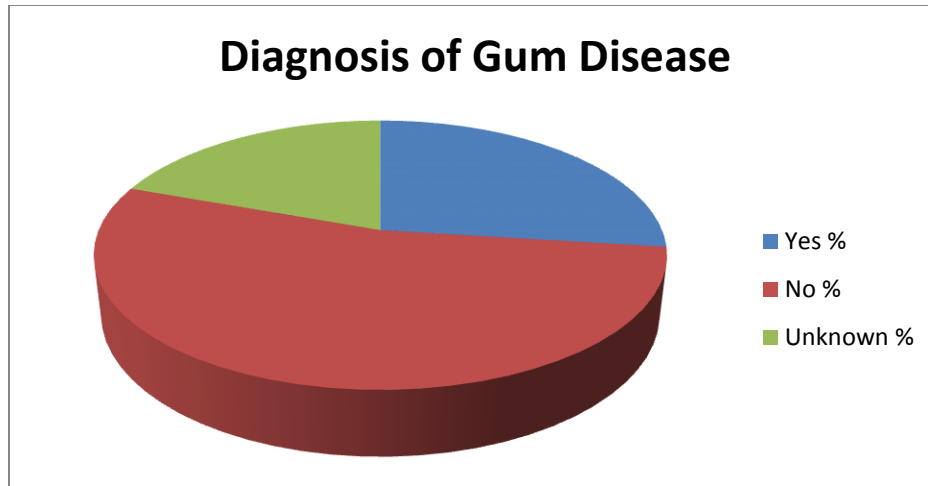


**Figure 5.5: Frequency of using Floss or Oral Rinse**

## 5.6: Prevalence of Gum Disease in people

**Table 5.6: Prevalence of Gum Disease**

	Number	Percentage (%)
Yes	54	27
No	107	53.5
Unknown	39	19.5



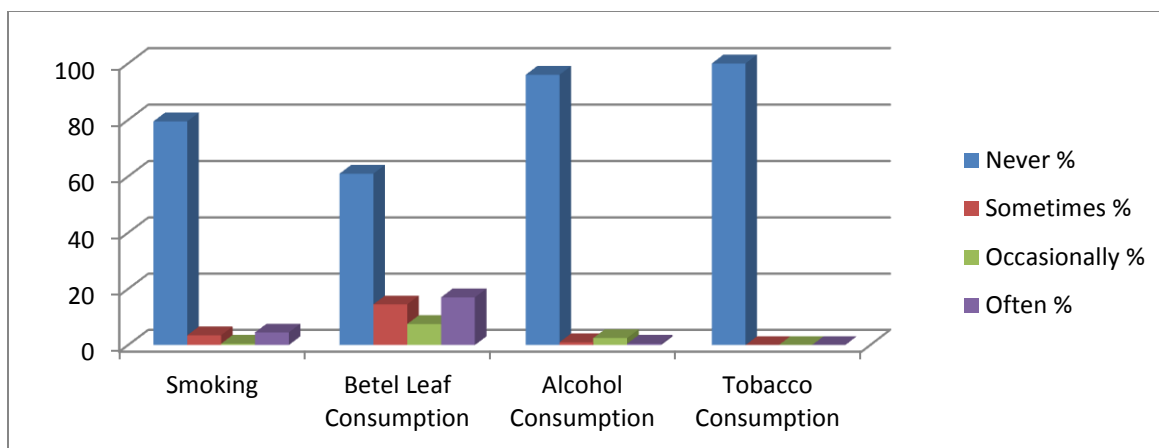
**Figure 5.6:** People diagnosed with gum disease

Among 200 participants, 27% were diagnosed with gum disease, 53.5 % had not gum disease but 19.5 % people were not known to gum disease.

### 5.7: People having bad habits that are harmful for oral hygiene

**Table 5.7:** People having bad habits that are harmful for oral hygiene

	Never		Sometimes		Occasionally		Often	
	Number	%	Number	%	Number	%	Number	%
Smoking	159	79.5	7	3.5	1	0.5	9	4.5
Use of Betel leaf	122	61	29	14.5	15	7.5	34	17
Alcohol consumption	192	96	2	1	5	2.5	1	0.5
Tobacco consumption	200	100	0	0	0	0	0	0

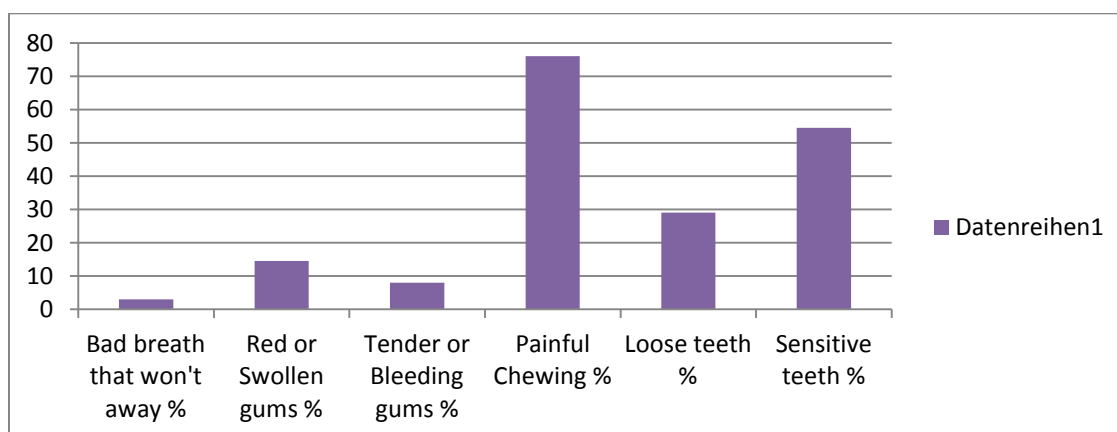


**Figure 5.7:** Habits of people which are harmful for oral hygiene

### 5.8: Common Symptoms of Periodontal Disease in patients

**Table 5.8: Common Symptoms of Periodontal Disease**

	Number	Percentage (%)
Bad breath that won't away	6	3
Red or swollen gums	29	14.5
Tender or bleeding gums	16	8
Painful chewing	152	76
Loose teeth	58	29
Sensitive teeth	109	54.5

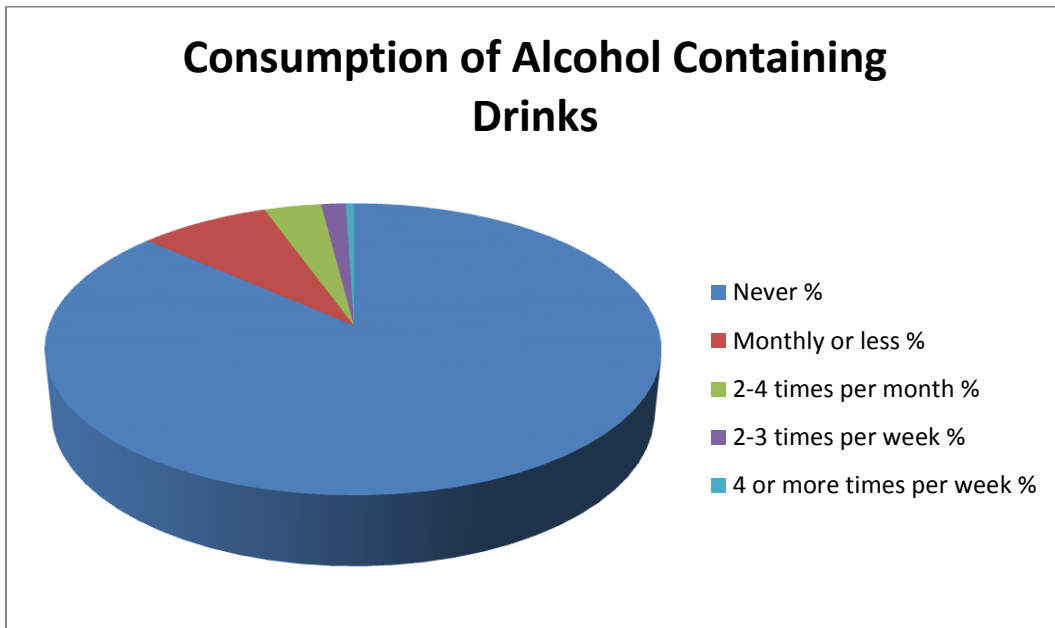


**Figure 5.8:** Common Symptoms of Periodontal Disease

### 5.9: Consumption rate of alcohol containing drinks among people

**Table 5.9: Consumption rate of alcohol containing drinks**

	Number	Percentage (%)
Never	173	86.5
Monthly or less	16	8
2-4 times per month	7	3.5
2-3 times per week	3	1.5
4 or more times per week	1	0.5

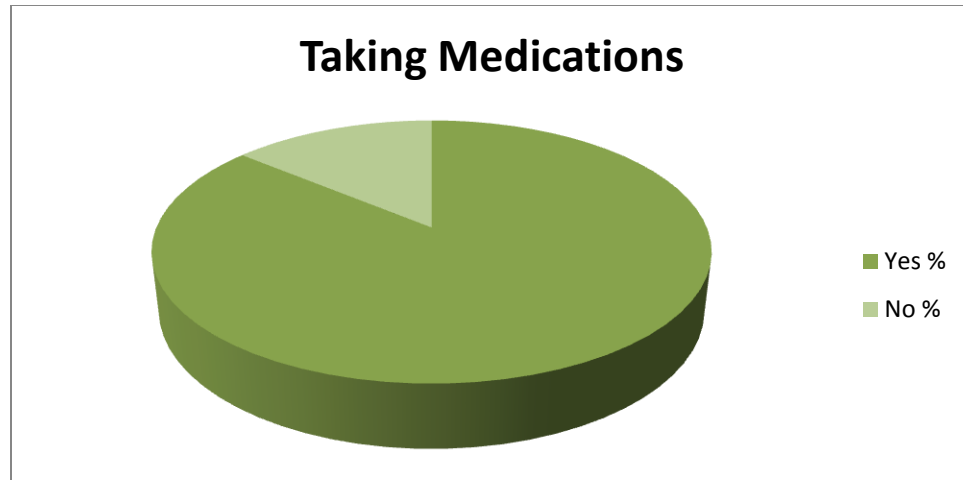


**Figure 5.9:** Consumption rate of drink containing alcohol

### 5.10: Taking Medications to improve oral conditions

**Table 5.10: Taking medicine**

Yes		No	
Number	Percentage	Number	Percentage
172	86	28	14



**Figure 5.10:** Patients taking medications

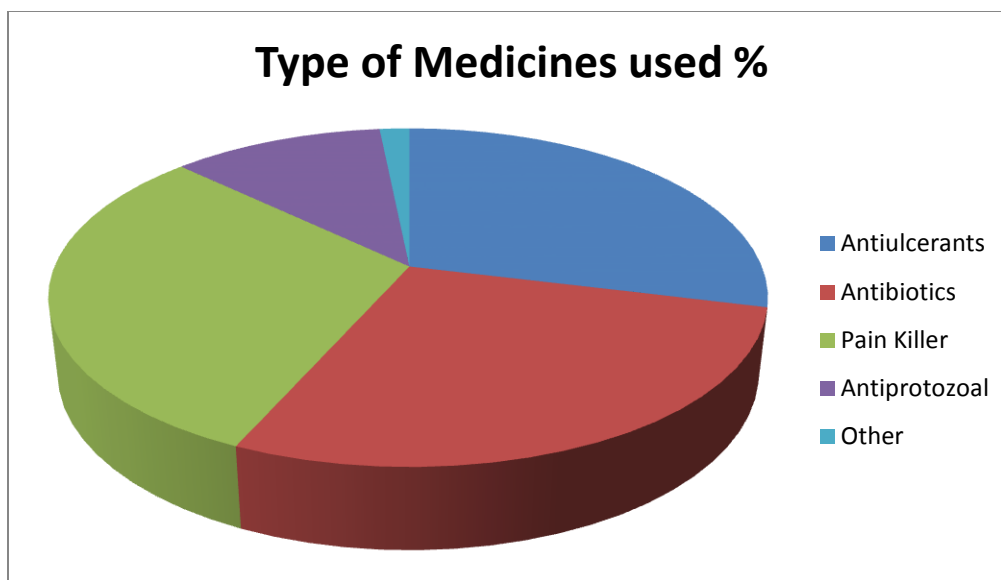
Among 200 participants, 172 patients have taken medicine to improve their oral condition. It is 86% of total population.

### 5.11: Types of medicines prescribed to patients

Different types of medicines are prescribed to patients with periodontal diseases.

**Table 5.11: Types of medicines prescribed**

Types of medication	Number	Percent (%)
Antiulcerants	145	84.30233
Antibiotics	140	81.39535
Pain killers	153	88.95349
Antiprotozoal	57	33.13953
Other	8	4.651163

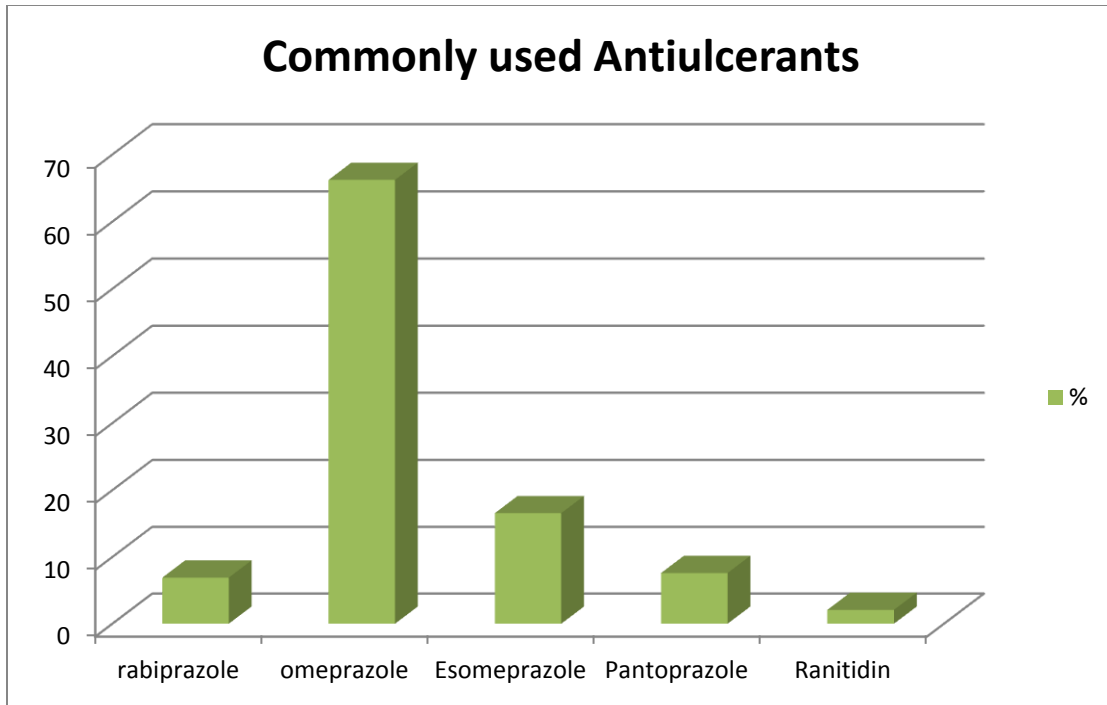


**Figure 5.11:** Types of medicines prescribed

### 5.11.1: Antiulcerants which are commonly prescribed to patients

**Table 5.12: Commonly used Antiulcerants**

Generic Name	Number	Percent (%)
Rabiprazole	10	6.896552
Omeprazole	96	66.2069
Esomeprazole	24	16.55172
Pantoprazole	11	7.586207
Ranitidine	3	2.068966

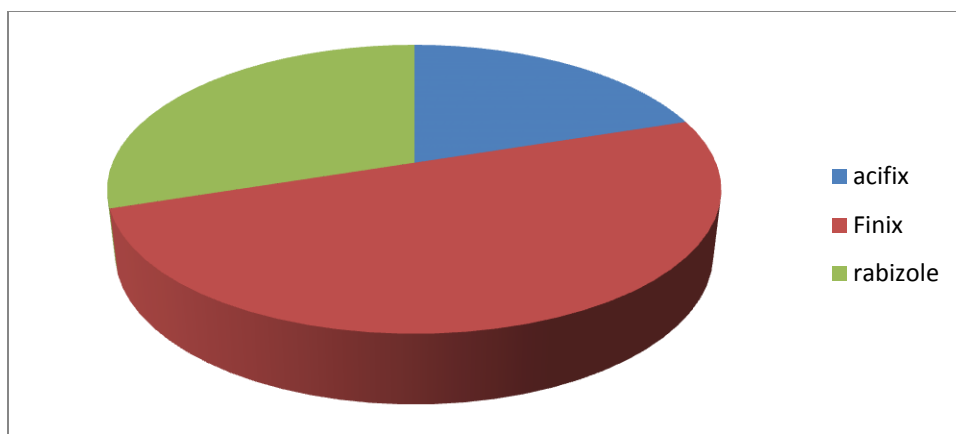


**Figure 5.12:** Commonly prescribed Antiulcerants

### 5.11.1.1: Commonly used Brand of Rabiprazole

**Table 5.13: Brand of Rabiprazole used**

Brand Name	Number	Percent (%)
Acifix	2	20
Finix	5	50
Rabizole	3	30



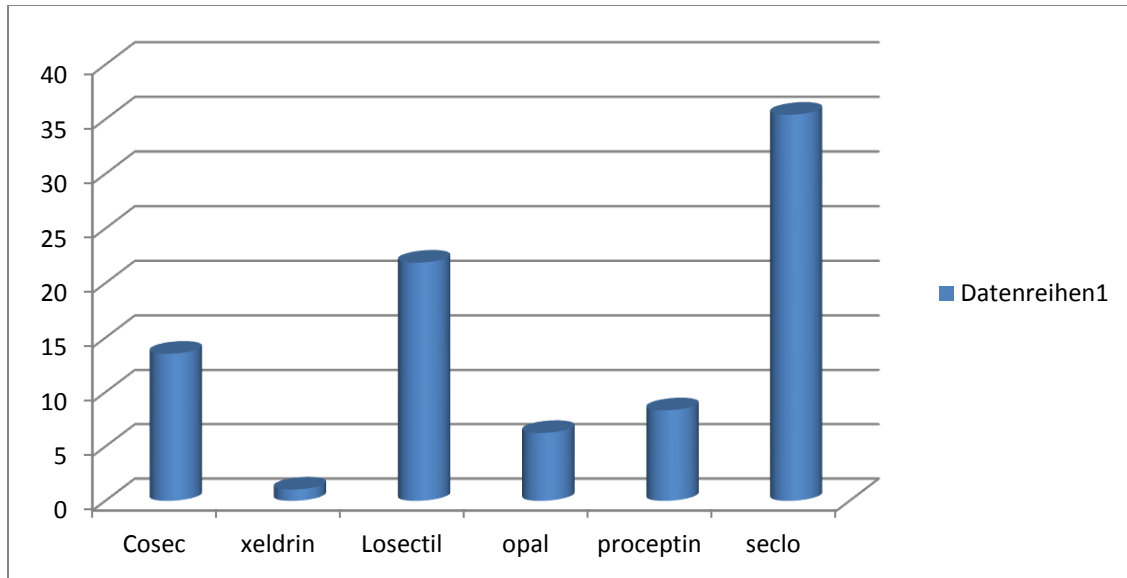
**Figure 5.13:** Commonly used brand of Rabiprazole

#### 5.11.1.2: Commonly used Brand of Omeprazole

**Table 5.14: Brand of Omeprazole used**

Brand Name	Number	Percent (%)
Cosec	13	13.54167
Xeldrin	1	1.041667
Losectil	21	21.875
Opal	6	6.25
Proceptin	8	8.333333
Seclo	34	35.41667



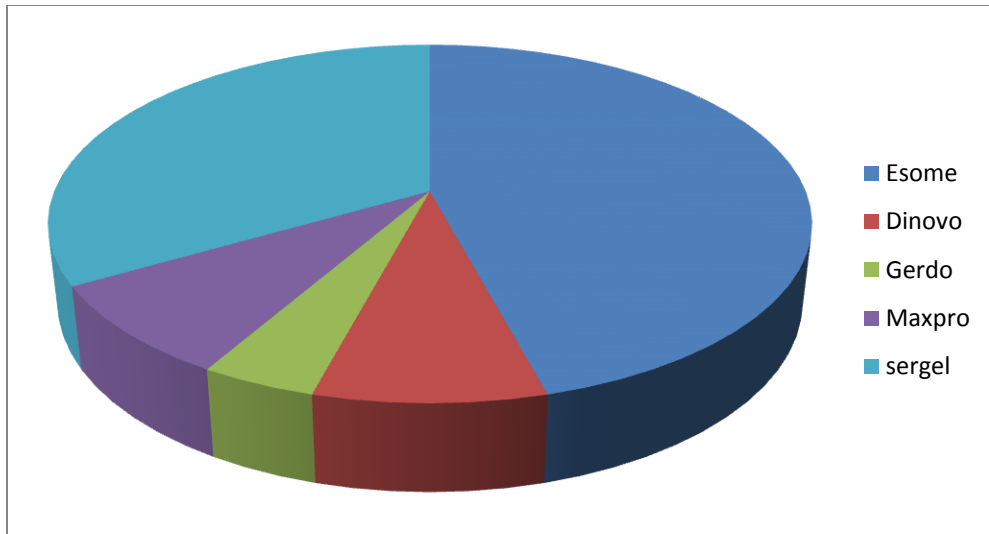


**Figure 5.14:** Commonly used brand of Omeprazole

### 5.11.1.3: Brand of Esomeprazole

**Table 5.15: Brand of Esomeprazole used**

Brand Name	Number	Percent (%)
Esome	11	45.83333
Dinovo	2	8.333333
Gerdo	1	4.166667
Maxpro	2	8.333333
Sergel	8	33.33333

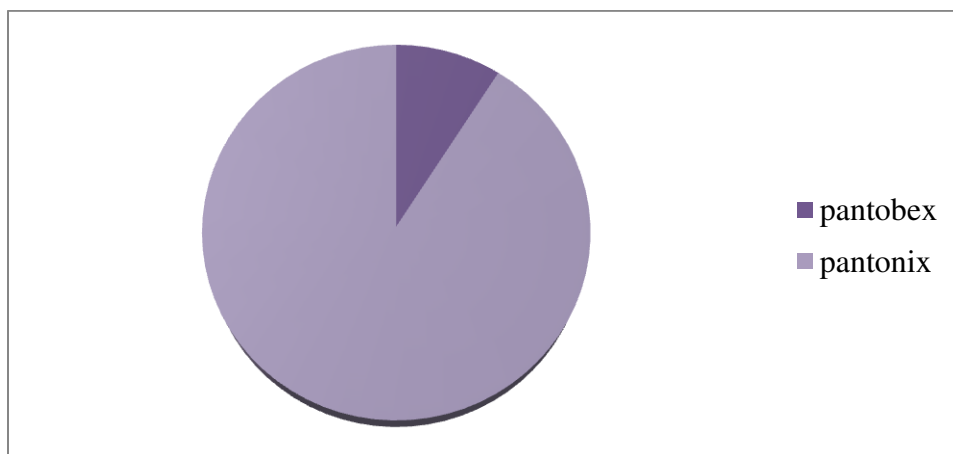


**Figure 5.15:** Commonly used Brand of Esomeprazole

#### 5.11.1.4: Brand of Pantoprazole

**Table 5.16: Brand of Pantoprazole used**

Brand Name	Number	Percent (%)
Pantobex	1	9.090909
Pantonix	10	90.90909

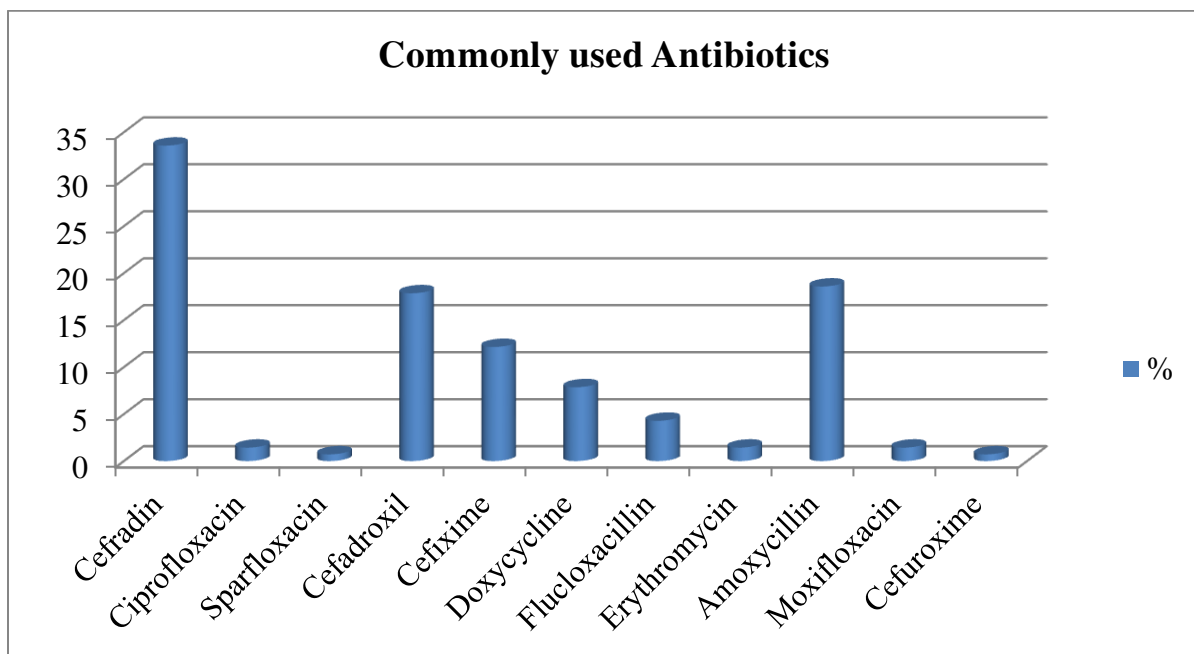


**Figure 5.16:** Commonly used Brand of Pantoprazole

### 5.11.2: Antibiotics

**Table 5.17: Widely prescribed Antibiotics**

Generic names	Number	Percent (%)
Cefradin	47	33.57143
Ciprofloxacin	2	1.428571
Sparfloxacin	1	0.714286
Cefadroxil	25	17.85714
Cefixime	17	12.14286
Doxycycline	11	7.857143
Flucloxacillin	6	4.285714
Erythromycin	2	1.428571
Amoxicillin	26	18.57143
Moxifloxacin	2	1.428571
Cefuroxime	1	0.714286

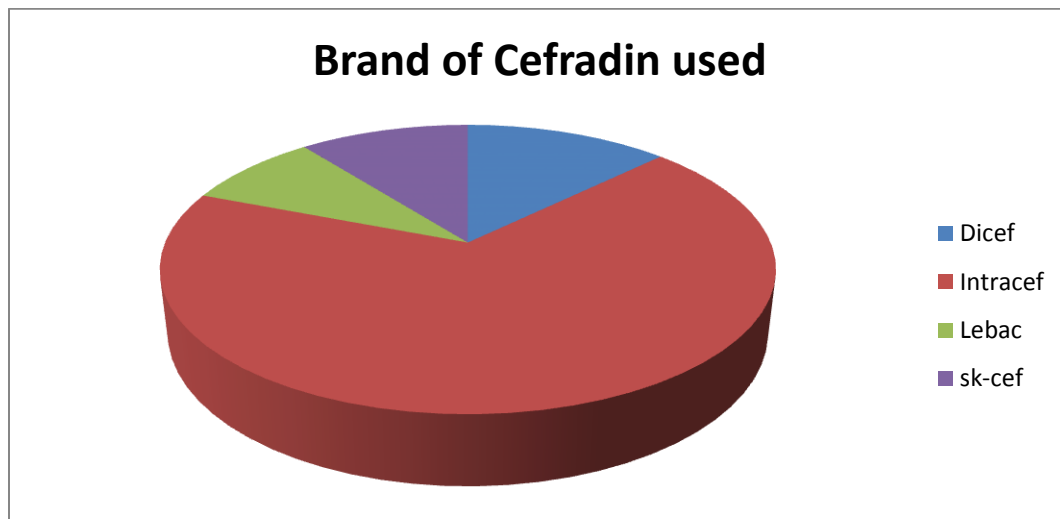


**Figure 5.17:** The classes of antibiotics prescribed widely

### 5.11.2.1: Brand of Cefradin

**Table 5.18: Brand of Cefradin used**

Brand Name	Number	Percent (%)
Dicef	6	12.76596
Intracef	32	68.08511
Lebac	4	8.510638
Sk-cef	5	10.6383

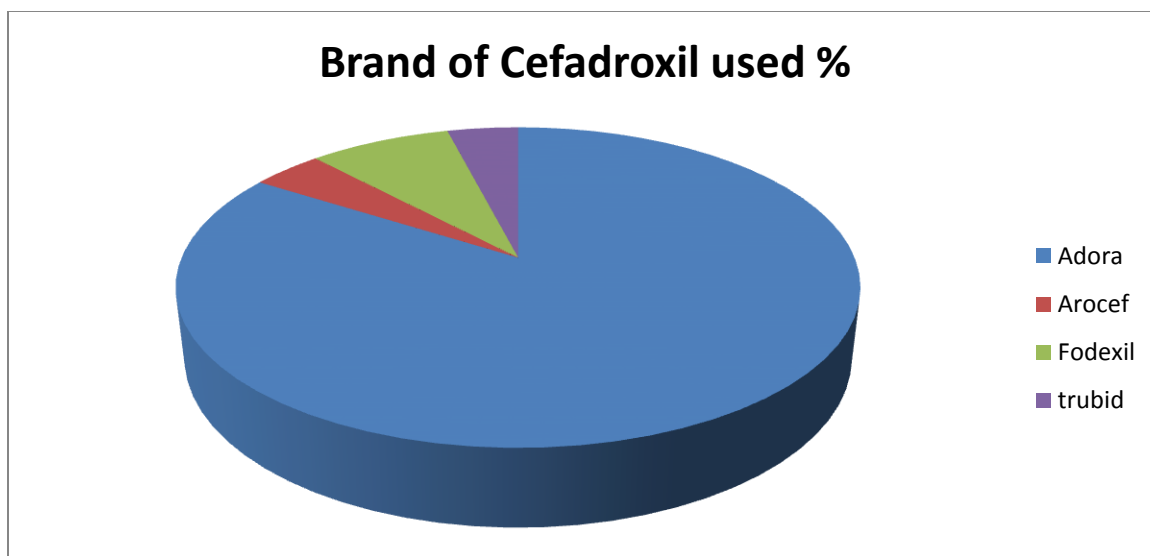


**Figure 5.18: Commonly used Brand of Cefradin**

### 5.11.2.2: Brand of cefadroxil

**Table 5.19: Brand of Cefadroxil used**

Brand Name	Number	Percent (%)
Adora	21	84
Arocef	1	4
Fodexil	2	8
Turbid	1	4

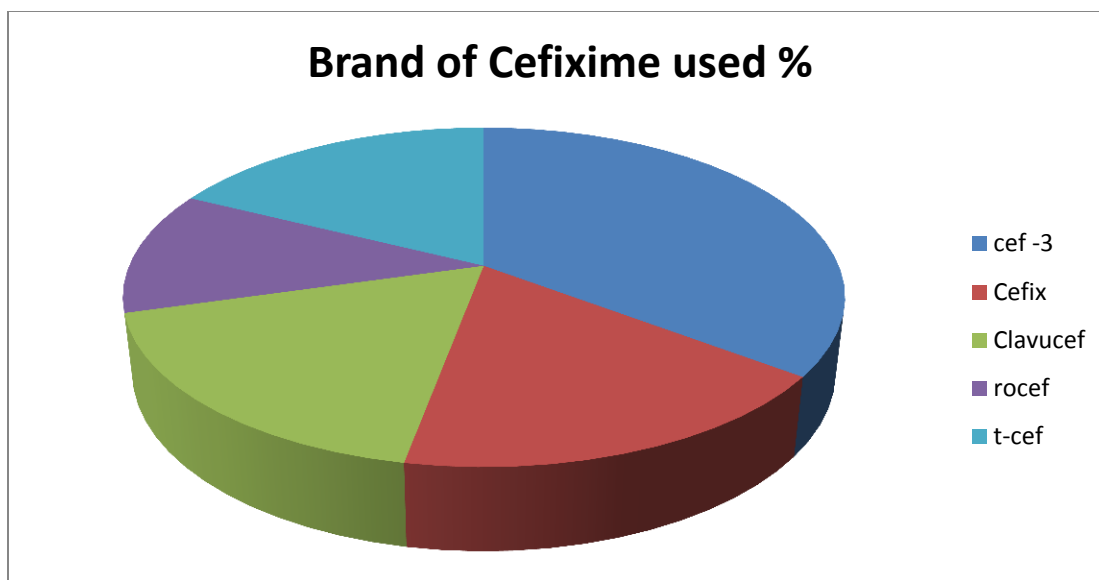


**Figure 5.19:** Commonly used brand of Cefadroxil

### 5.11.2.3: Brand of cefixime

**Table 5.20: Brand of Cefixime used**

Brand Name	Number	Percent (%)
Cef-3	6	35.29412
Cefix	3	17.64706
Clavucef	3	17.64706
Rocef	2	11.76471
T-cef	3	17.64706

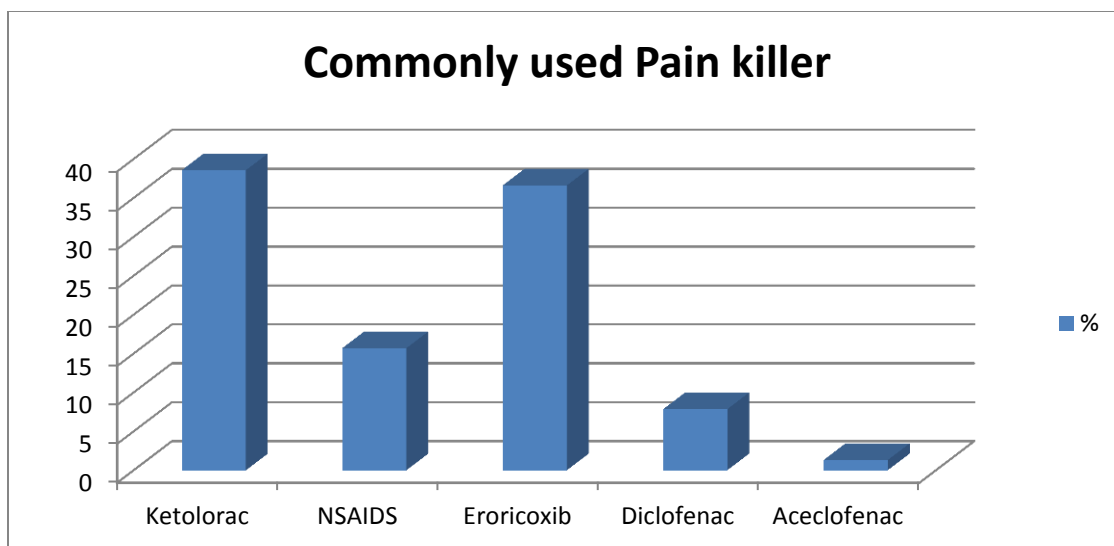


**Figure 5.20:** Commonly used Brand of Cefixime

### 5.11.3: Painkillers

**Table 5.21: Commonly used Pain killer**

Generic names	Number	Percent (%)
Ketorolac	59	38.56209
NSAIDS	24	15.68627
Etoricoxib	56	36.60131
Diclofenac	12	7.843137
Aceclofenac	2	1.30719

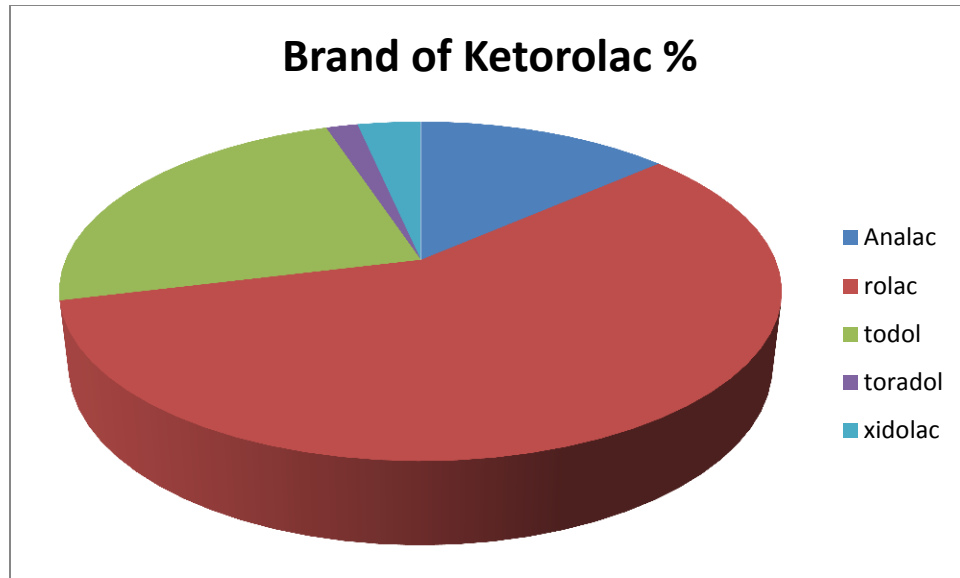


**Figure 5.21:** Commonly used Pain killer

### 5.11.3.1: Prescribed Brand of Ketorolac

**Table 5.22: Brand of Ketorolac**

Brand Name	Number	Percent (%)
Analac	8	13.55932
Rolac	34	57.62712
Todol	14	23.72881
Toradol	1	1.694915
Xidolac	2	3.389831



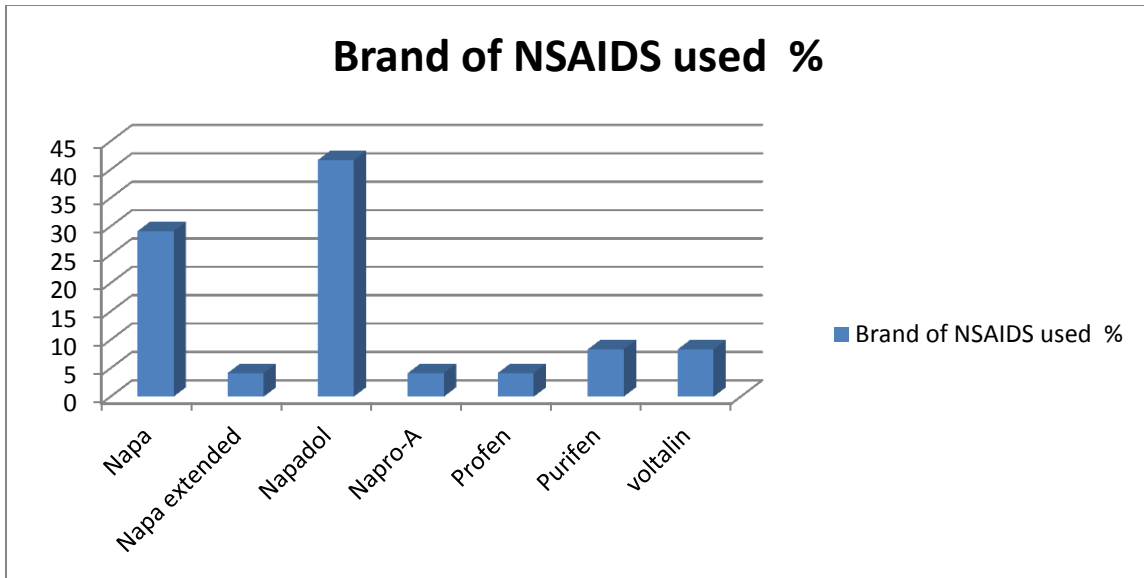
**Figure 5.22:** Commonly used Brand of Ketorolac

### 5.11.3.2: Brand of NSAIDs

**Table 5.23: Brand of NSAIDS**

Brand Name	Number	Percent (%)
Napa	7	29.16667
Napa Extended	1	4.166667
Napadol	10	41.66667
Napro-A	1	4.166667
Profen	1	4.166667
Purifen	2	8.333333
Voltalin	2	8.333333



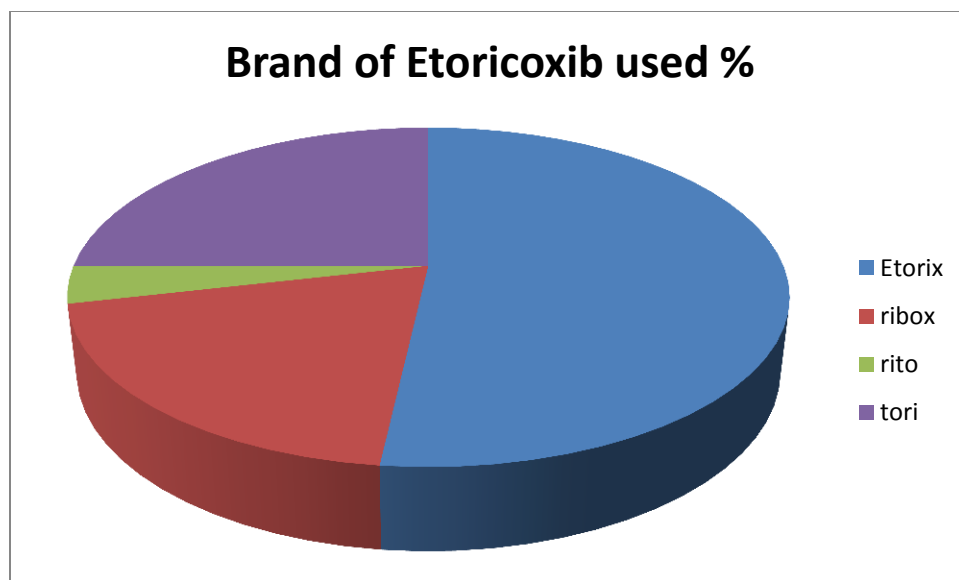


**Figure 5.23:** Commonly used Brand of NSAIDS

### 5.11.3.3: Brand of Etoricoxib

**Table 5.24:** Brand of Etoricoxib used

Brand Name	Number	Percent (%)
Etorix	29	51.78571
Ribox	11	19.64286
Rito	2	3.571429
Tori	14	25



**Figure 5.24:** Commonly used Brand of Etoricoxib

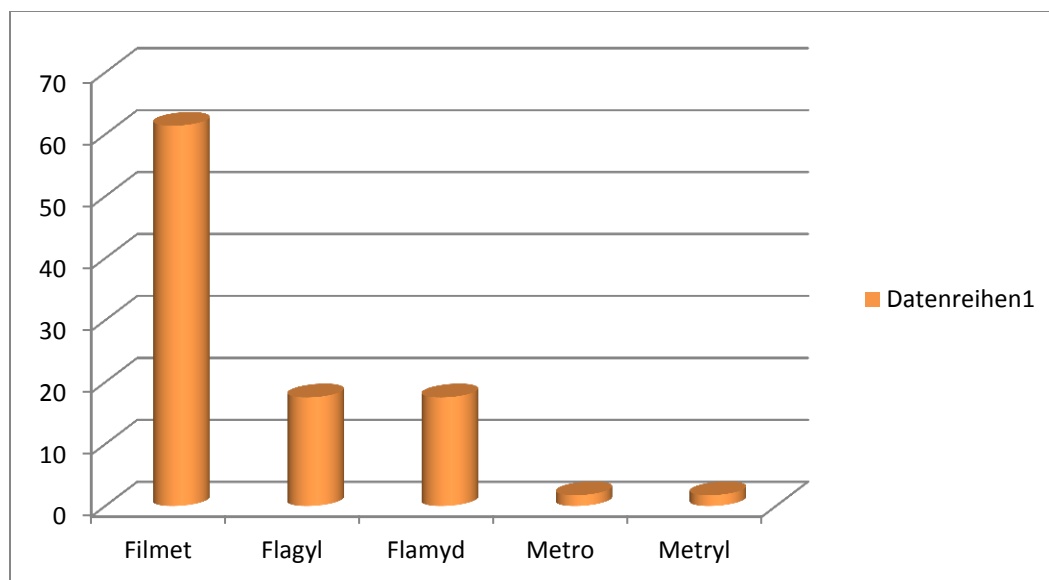
#### 5.11.4: Antiprotozoals

There is a wide application of antiprotozoal in treating gum disease. **Metronidazole** is the generic name of the drug which has most commonly been prescribed in the treatment of gum disease. But different brand of this drug is prescribed by different dentists. **Ornidazole** is also a generic which is prescribed in a few prescriptions.

The most commonly used brands of **Metronidazole** are:

**Table 5.25: Most common brands of Metronidazole used**

Brand Name	Number	Percent (%)
Filmet	35	61.40351
Flagyl	10	17.54386
Flamyd	10	17.54386
Metro	1	1.754386
Metryl	1	1.754386



**Figure 5.25:** Commonly used different brands of Metronidazole

### 5.11.5: Additional Medications

Besides Antiulcerants, Antibiotics, Painkillers and Antiprotozoal, there are some others drugs prescribed to treat gum disease.

These other types of medications include: Some antiseptics, Activated Charcoal (to remove gas from stomach), Calcium supplement with vitamin D and Ascorbic Acid or Vitamin C.

**Table 5.26: Additional drugs in the treatment of gum disease**

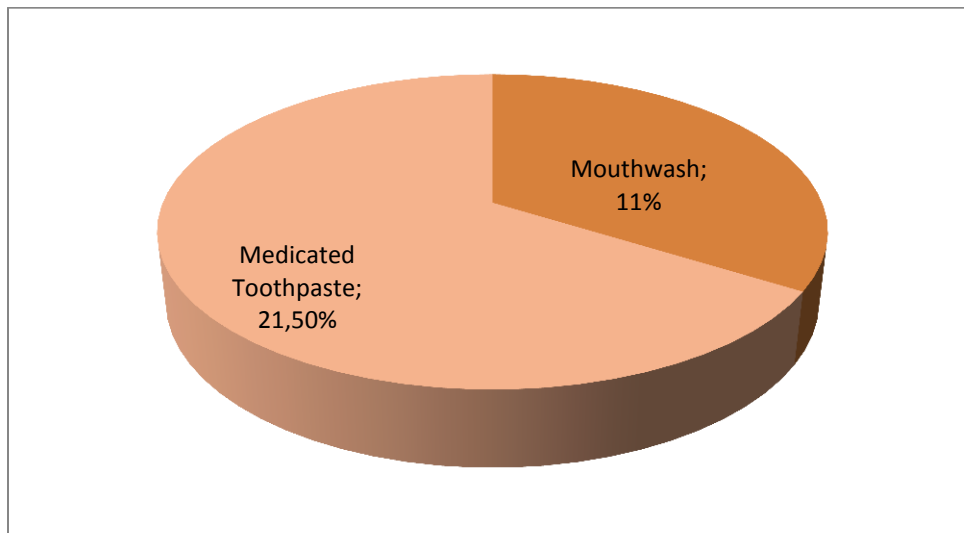
Type of Medicine	Number	Percent (%)
Antiseptic	1	12.5
Ascorbic acid	1	12.5
Activated Charcoal	1	12.5
Calcium supplement/vitamin D	1	12.5
Calcium	4	50

### 5.12: Use of Medicated Toothpastes and Mouthwashes

Some medicated toothpastes and mouthwashes are also prescribed for some patients along with their medications.

**Table 5.27: Use of Medicated Toothpaste and Mouthwash**

	<b>Number</b>	<b>Percent (%)</b>
Medicated Toothpaste	43	21.50
Mouthwash	22	11

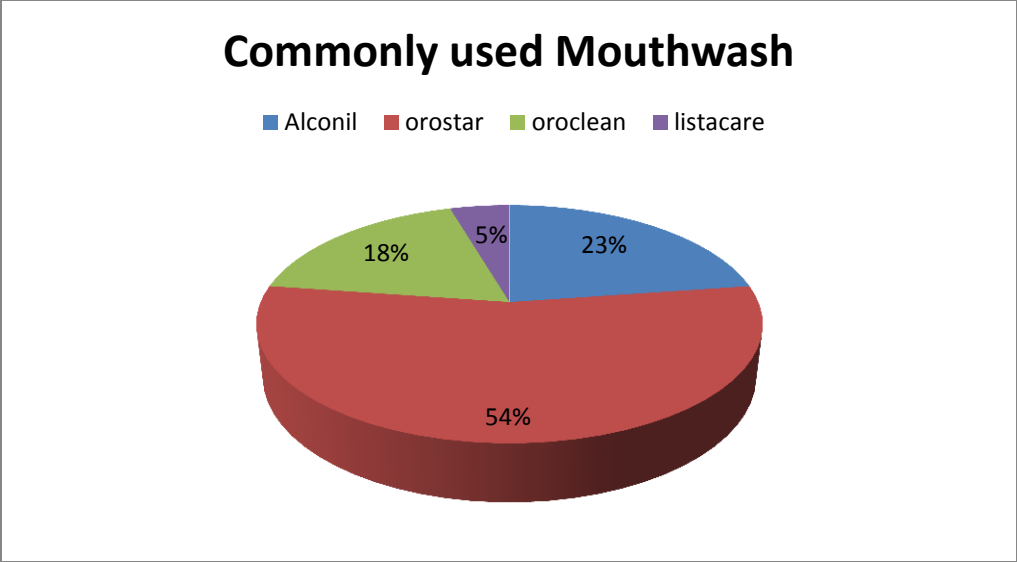


**Figure 5.27:** Frequency of use of Medicated Toothpaste and Mouthwash

### 5.12.1: Brand of Mouthwash

**Table 5.28: Brand of Mouthwash**

<b>Brand Name</b>	<b>Number</b>	<b>Percent (%)</b>
Alconil	5	22.72727
Orostar	12	54.54545
Oroclean	4	18.18182
Listacare	1	4.545455

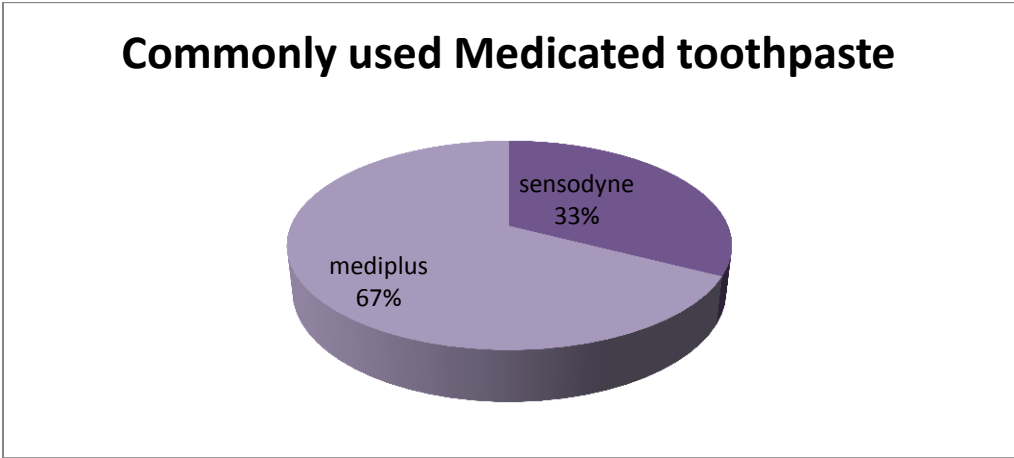


**Figure 5.28:** Commonly used Brand of Mouthwash

**5.12.2: Brand of Medicated Toothpaste**

**Table 5.29: Brand of Medicated Toothpaste**

Brand Name	Number	Percent (%)
Sensodyne	14	32.55814
Mediplus	29	67.44186

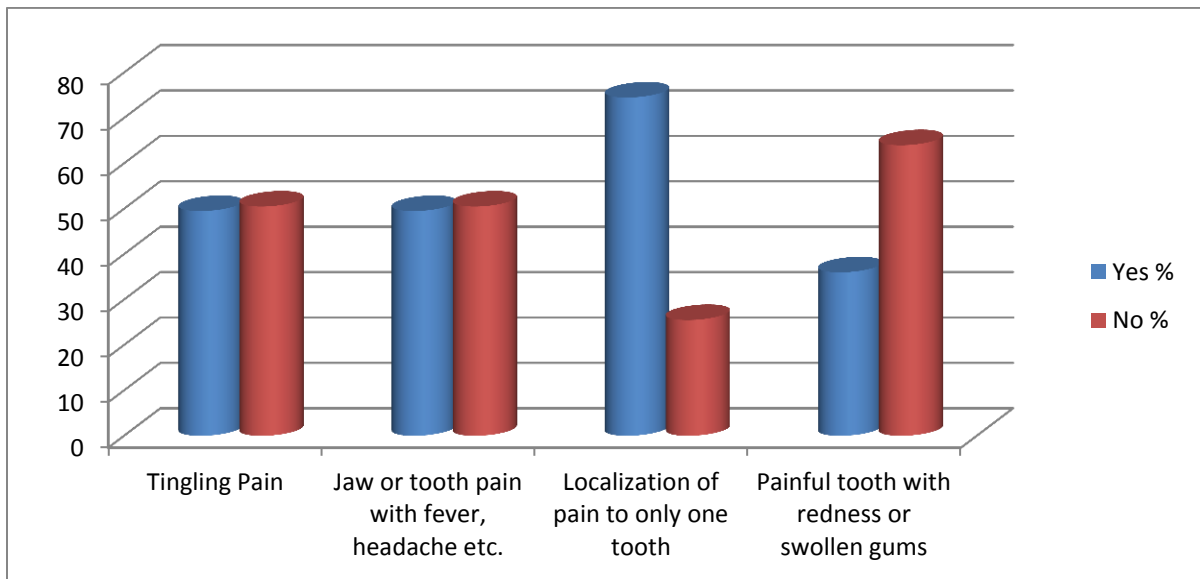


**Figure 5.29:** Commonly used Brand of Medicated Toothpaste

**5.13: Complications which are most commonly observed in patients with periodontal diseases**

**Table 5.30: Observed complications in patients with periodontal disease**

	Yes		No	
	Number	Percentage	Number	Percentage
Tingling pain	99	49.5	101	50.5
Jaw or tooth pain along with headache, fever etc.	99	49.5	101	50.5
Localization of pain in only one tooth	149	74.5	51	25.5
Painful tooth with redness or swollen gums	72	36	128	64



**Figure 5.30: Types of complications in patients**

# **Chapter Six**

## **Discussion**

Among 200 populations, 47% were male and 53% were female. Most of the people were in the age range of 26-40 years (16%) and 41-65 years (18%). The rest of the population was in the age range of below 25 years (11.5%) and above 65 years (1%).

When patients were asked about their problems for six weeks, 50% people often had the difficulty in chewing foods, 24% had occasionally and 27% had never. In case of painful aching in mouth, 37% people had it often, 23% had occasionally and 41% had never. 57% people never faced any uncomfortable feeling of teeth, 24% felt occasionally and 20% felt often. Due to the problems, 41% people occasionally faced difficulty in doing jobs, 33% people felt it never but 26% people often felt this difficulty in doing their jobs.

65.5% people have the habit of brushing their teeth twice a day; 33.5% people brush their teeth once a day. Only 1% people were identified who brush their teeth more than twice a day. A major portion of the people does not use floss (76%) and oral rinse (60%). 12.5% people use floss and 18.5% people use oral rinse once a day. The percentage of people who use floss is negligible but 14% people use oral rinse twice a day.

Among total population, 53.5% people had no gum disease. 27% people were diagnosed with gum disease but 19.5% people did not know whether they had gum disease. The people with gum disease were from 5 years up to 50 years.

There were some people who had bad habits like smoking, alcohol and tobacco consumption, use of betel leaf. 79.5% people had no habit of smoking, 61% people did not use betel leaf and 96% and 100% people did not consume alcohol and tobacco respectively. Among the smokers, 3.5% smokers did smoke sometimes, 0.5% did it occasionally and 4.5% had the habit of smoking often. 14.5%, 7.5% and 17% people consumed betel leaf sometimes, occasionally and often.

People having the common symptoms of periodontal disease were identified as bad breath that won't away (3%), red or swollen gums (14.5%), tender or bleeding gums (8%), painful chewing (76%), loosening of teeth (29%) and sensitivity of teeth (54.5%).

In case of consuming alcohol, 86.5% people did not consume it never, 8% consumed alcohol monthly or less, 3.5% consumed 2-4 times per month, 1.5% consumed 2-3 times per week and



only 0.5% consumed alcohol for 4 or more times per week. There were some people who never consume alcohol directly but they sometimes consume some drinks containing alcohol.

Among 200 participants, 86% patients took medicine to improve their oral condition but 14% did not take medicine. The patients were prescribed with various types of medications such as Antiulcerants (84%), Antibiotics (81%), Pain killers (88%), Antiprotozoal (33%) and other medicines (5%). Among the Antiulcerants, Proton Pump Inhibitors (PPIs) are most commonly prescribed.

Among PPIs, Rabiprazole (6%), Omeprazole (66%), Esomeprazole (16%) and Pantoprazole (7%) are prescribed. For Rabiprazole, acifix (20%), Finix (50%) and Rabizole (30%) are commonly prescribed. Most commonly used brands of Omeprazole are Cosec (13%), Losectil (21%) and Seclo (35%). Xeldrin (1%), Opal (6%) and Proceptin (8%) are also prescribed in little amount. Esome (45%), Dinovo (8%), Gerdo (4%), Maxpro (8%) and Sergel (33%) are the most commonly prescribed brand of Esomeprazole. Pantoprazole is most commonly prescribed under the brand name of Pantonix (90%) and Pantobex (10%).

Cefradin (33%), Cefadroxil (17%), Cefixime (12%) and Amoxicillin (18%) are most commonly prescribed antibiotics. Ciprofloxacin (1%), Sparfloxacin (0.7%), Doxycycline (7%), Flucloxacillin (4%), Erythromycin (1%), Moxifloxacin (1%) and Cefuroxime (0.7%) are also prescribed antibiotics in the treatment of periodontal disease. Dicef (12%), Intracef (68%) and Sk-cef (10%) are the most common used brand of Cefradin. Lebac is also a brand of Cefradin which is prescribed in only 8.5%. Adora (84%), Arocef and Turbid (4%) and Fodexil (8%) are the commonly prescribed brand of Cefadroxil. Cefixime is prescribed under the brand name of Cef-3 (35%), Cefix, Clavucef, T-cef in 17% and Rocef in 11%.

As a painkiller, NSAIDs and Cox-II inhibitors are used. Most commonly prescribed painkillers are Ketorolac (39%), NSAIDs (16%), Etoricoxib (37%), Diclofenac (8%) and Aceclofenac (1%). Analac (14%), Rolac (58%), Todol (24%) are widely prescribed brand names of Ketorolac. Toradol (2%) and Xidolac (3%) are also prescribed brands of Ketorolac. NSAIDs are prescribed as Napa (29%) and Napadol (41%). Napa Extended, Napro-A and Profen are prescribed in only 4% whereas Purifen and Voltalin are prescribed in 8%. The commonly prescribed brands of Etoricoxib are Etorix (52%), Ribox (20%) and Tori (25%). Rito is prescribed in 4% cases.

There is a wide application of Antiprotozoal in treating gum disease. Metronidazole is the generic name of the drug which has most commonly been prescribed in the treatment of gum disease. But different brand of this drug is prescribed by different dentists. The most commonly used brands of Metronidazole are Filmet (61%), Flagyl (18%) and Flamyd (18%). Mtero and Metryl are also the brands of Metronidazole prescribed in only 2%. Ornidazole is prescribed in only 0.6%.

Besides these medicines, the other 5% medicines are some antiseptics (12.5%), Activated Charcoal which is used to remove gas from stomach (12.5%), Calcium supplement with vitamin D (12%), Ascorbic Acid or Vitamin C (12.5%). Sometimes, Calcium is prescribed alone (50%). Cavic (75%) and Cavic Plan (25%) are the prescribed brand of Calcium.

Some medicated toothpastes and mouthwashes are also prescribed for some patients along with their medications. Medicated toothpastes and mouthwashes are used in 22% and 11%, respectively. Mediplus (67%) and sensodyne (33%) are most commonly used as medicated toothpaste. Alconil (23%), Orostar (55%), Oroclean (18%) and Listacare (5%) are used as mouthwashes.

In patients with periodontal disease, the commonly observed complications are tingling pain (50%), jaw or tooth pain along with fever, headache (50%), localization of tooth pain in only one tooth (75%) and painful tooth with red or swollen gums (36%). The rest of the populations did not have this type of complications.

# **Chapter Seven**

## **Conclusion**

Periodontal disease is one of the most common diseases in Bangladesh. Day by day, the rate of this disease is increasing among the population of Bangladesh. Many factors are playing a responsible role in creating and promoting the disease. By analyzing the age and sex, it has been seen that this disease is not limited in any sex or age range. It may be occurred in a wide range of people. Among a number of factors causing periodontal disease, lifestyle has a major role. Most of the people are not aware of their oral hygiene. They do not brush their teeth regularly. Though they do so, they do not brush teeth in a proper way. As a result, the bacteria get the chance of growing on their tooth surface and can cause harm to teeth. Some people have the bad habit of smoking, consuming tobacco and alcohol etc. These habits are also responsible for causing gum disease. Carbohydrate can promote the growth of bacteria on tooth surface but as people do not know this, they are not aware of brushing their teeth after taking carbohydrate type foods. In most of the cases, the symptoms of gingivitis are invisible. This can lead to a false assumption of oral health. In some of the cases, periodontal disease has the association with other systemic diseases like diabetes. So, diabetic patients should need extra care and awareness about their oral health.

In Bangladesh, periodontal diseases are treated with various types of antibiotics and painkillers. As the painkillers can increase acid secretion in the stomach, several PPIs and H2 blockers are prescribed along with painkillers. Among the PPIs, Omeprazole and Esomeprazole are most commonly prescribed. In case of antibiotics, different classes of Cephalosporin are widely used. Besides these, beta-lactam antibiotics such as amoxicillin are also prescribed. Selective Cox-II inhibitors are preferred as painkillers. Sensodyne and Mediplus are considered as medicated toothpastes which have the role in improving oral hygiene.

From the survey, it can be concluded that in most of the cases, periodontal disease is supposed to be occurred due to the lack of awareness about oral hygiene. To improve the condition and to make people more aware, people should be given knowledge about various oral problems and their prevention. The lifestyles and habits should also be modified. If people will be able to take care of themselves, the rate of periodontal disease will be decreased automatically.

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