

*Survey on dental caries in
Sapporo Dental College and Hospital, Dhaka*



A project work that partially fulfills the requirements for the Bachelor of Pharmacy degree was submitted to the Department of Pharmacy at Daffodil International University.

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Approval

The Department of Pharmacy, Faculty of Health and Life Sciences, Daffodil International University has accepted this project, Survey on Causes and Management of Dental Caries.

A Patient Study in Sapporo Dental College and Hospital - Dhaka, as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy (B.Pharm) and approved as to its style and contents.

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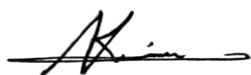
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Declaration

In order to partially fulfill the requirements for the degree of Bachelor of Pharmacy. I, Md. Naimul Islam, thus declare that I am working on this project under the supervision of

Dr. Md. Sarowar Hossain, Associate Dean & Associate Professor, Faculty of Health and Life Sciences , **Daffodil International University.** The project's results have not been distributed to any other institution or organization with the express purpose of awarding degrees.

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Certificate

This confirms that the research findings used in this project are unique and haven't been fully submitted for another degree or certificate that this university accepts. In order to significantly meet the requirements for the Bachelor of Pharmacy degree, the entire current paper has been submitted as a project.



Dr. Md. Sarowar Hossain

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Acknowledgement

I want to start by thanking Allah, the Almighty, for granting me the ability to finish my job and give this issue top priority. Furthermore, I would like to express my gratitude to Dr. Md. Sarowar Hossain, Associate Dean and Associate Professor, Faculty of Health and Life Sciences at Daffodil International University, for his invaluable counsel and consistent supervision, as well as for helping me to complete the research.

I would want to thank Dr. Muniruddin Ahmed, a professor and the head of the pharmacy department at Daffodil International University. In addition, I would like to thank all of the lecturers at Daffodil International University's Pharmacy Department as well as the other members for their enjoyable interactions. In conclusion, I would want to express my gratitude to my family for their unwavering encouragement and support during this endeavor.

Author

Md Naimul Islam

Dedication

Dedicated this work to my parents, Supervisor and all my well-wishers

Abstract

Background: The most prevalent oral health issue brought on by bacterial interaction with tooth enamel is dental caries. Inadequate fluoride and the makeup of saliva are risk factors for dental caries. But the progression of caries is also influenced by other factors, including sociodemographic variables, behavior, cleanliness, dietary habits, and level of living. Thus, the purpose of this study was to ascertain the prevalence of dental caries and related variables among patients who visited the Sapporo Dental College and Hospital in Dhaka dental Hospital.

Method: From March 02–28, 2024, 221 systematically selected patients who were receiving care at Sapporo Dental College and Hospital in Dhaka dental hospital participated in a hospital-based cross-sectional study. A certified dental practitioner conducted an oral examination and used a pre-tested questionnaire to gather data. An oral assessment involved the observation of fundamental sanitary practices. The presence of decay on the teeth served as a check for dental caries. The study involved 221 participants in total, 145 (65.3%) of whom were male and 76 (34.7%) of whom were female. The majority of people in the 20–30 age range are more impacted by bottled drinks and sugary food consumption.

Conclusions: Dental caries was determined to be a public health issue with a high prevalence. Dental caries was found to be connected with poor oral hygiene behaviors, socioeconomic status, and educational attainment. The prevention of dental caries greatly depends on the integration of services and health promotion about oral cleanliness.

Keywords: Oral illness, Dental caries, Prevalence, Youth

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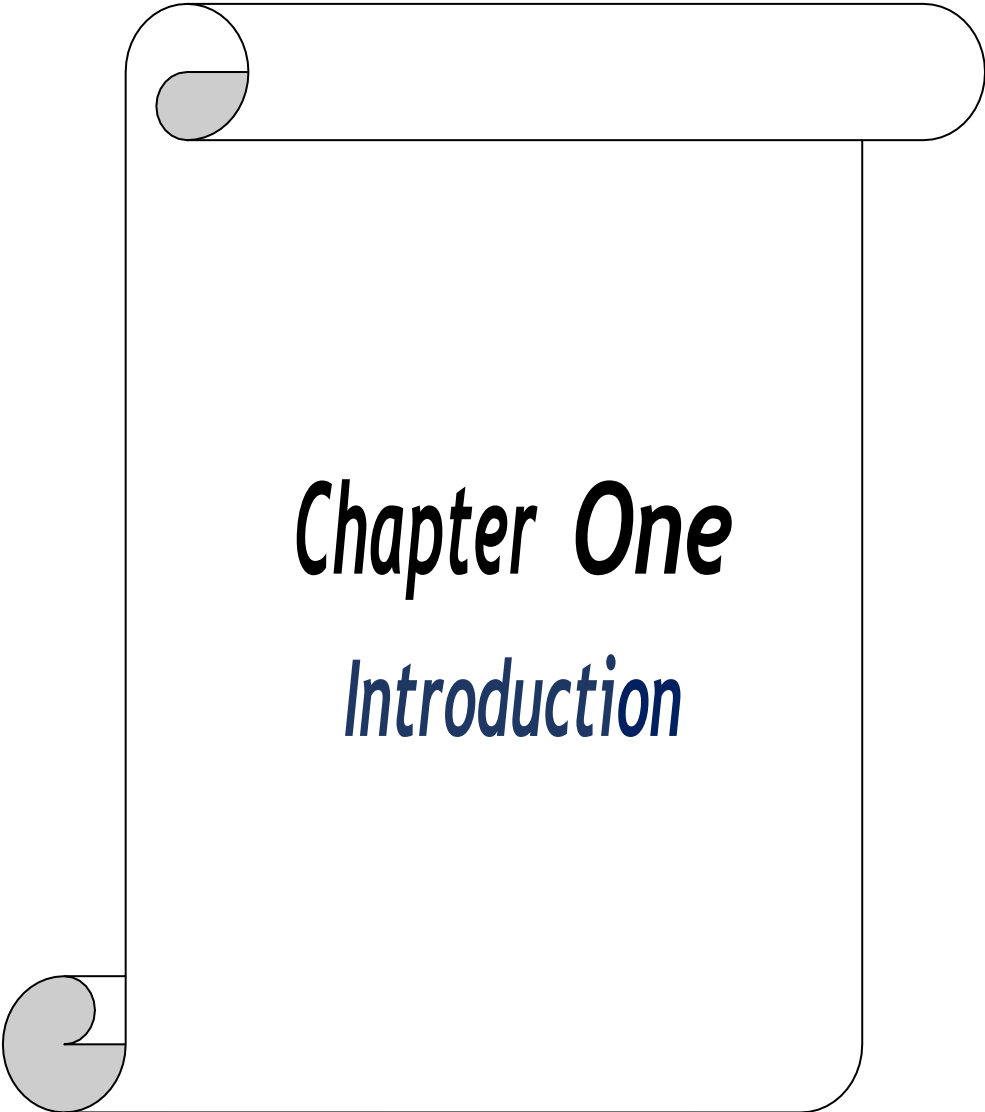
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Chapter One

Introduction

1. Introduction

Tooth decay is the popular term for dental caries. Dental caries is commonly perceived as tooth holes rather than a whole disease process by the general public and, oddly, even by dentists. Nonetheless, it has been understood for more than a century that bacteria that ferment food, produce acids, and dissolve tooth mineral are the root causes of dental decay. The process has been much better defined in recent decades in a number of areas, including microbiology, saliva, tooth mineral composition, ultrastructure, diffusion processes, demineralization kinetics, remineralization—the process of reversing demineralization—and factors that contribute to this reversal.[1–12].

Even though we now have a fairly thorough grasp of what occurs in the mouth, dentistry practice still does not effectively apply this knowledge. The illness process depends on the so-called cariogenic bacteria. When these bacteria ferment fermentable carbohydrates, at least two major types of bacteria—the lactobacilli species and the mutans streptococci—are able to create organic acids.[5, 12–14] Lactic, acetic, formic, and propionic acids are among those generated; it has been demonstrated that these acids can easily dissolve the minerals in enamel and dentine.[2, 15, 16] Acidogenic bacteria are those that make acid as a byproduct of their metabolism; certain of these bacteria, including the aforementioned types, are aciduric and can survive in an acidic environment.

Naturally, organic acids easily permeate in all directions through the pores in enamel or dentine and into the underlying tissue when they are created by the bacteria in dental plaque on the surface of the tooth. Acid diffuses into the tooth, finding minerals that are soluble in acid and starting to dissolve them.[2,17] A cavity will develop if this procedure continues for an extended period of time. Cavitation is the final stage of the disease process known as dental caries, and it typically takes many months or years for this process to occur in the mouth. Dental caries is a bacterial illness that spreads easily and is mostly brought on by the germs mentioned above consuming the carbohydrates that people put in their mouths.[11, 12] The final item is the so-called cavity or hole in the tooth. Babies are born with bacteria from their mothers or other primary caretakers, and it is possible for the bacteria to colonize soft tissues before teeth erupt.[8, 10, 18], The cycle of destruction starts as soon as the teeth erupt because cariogenic bacteria colonize them and turn them into dental plaque. As previously mentioned, we currently have a pretty good understanding of the dental caries process. The

processes of demineralization, remineralization, and fluoride's participation in these processes are well understood.[7]. Our teeth and bones are made of a mineral called carbonated hydroxyapatite, which has a complicated crystal structure and may be easily dissolved in acid. It has defects.[19, 20] Along with saliva's critical protective role in halting or reversing the caries process, many of the functions of salivary proteins have been determined.[3,21] Saliva has many antimicrobial properties, buffers the acids, and contains calcium in a soluble complexed state. It also supplies a saturated solution of calcium and phosphate to prevent demineralization and promote remineralization.[3,21] But there is still a lot we don't know about the intricate microbiology at play and the composition of the biofilm that is generally referred to as dental plaque.

1.1 History of dental carries

Dental caries, also referred to as cavities or tooth decay, is one of the most ancient and common disorders that afflict people. Here is a quick synopsis of its past:

- ❖ **Ancient Times:** Dental caries may have affected people for thousands of years, according to archeological findings. Toothaches and dental conditions are mentioned in ancient Egyptian literature that date back to approximately 5,000 B.C. Similarly, dental caries was a frequent issue even in early human communities, as evidenced by the presence of tooth decay in the remnants of ancient civilizations like the Indus Valley Civilization. [12,17]
- ❖ **Ancient Treatments:** Different societies created their own strategies to address dental caries. For example, dental discomfort was treated by the ancient Greeks and Romans using concoctions of herbs and minerals. Certain tribes practiced rituals and charms in an attempt to fend off evil spirits, believing that toothaches were their source.
- ❖ **Middle Ages:** In the Middle Ages, general practitioners or barbers would frequently treat dental issues. Dental care was primitive during this time. Herbal mixtures and even strange therapies like applying burning mouse ashes to the teeth were used as remedies. [12,32,17]
- ❖ **Rise of Dentistry:** In the 17th and 18th centuries, dentistry started to become recognized as a separate profession. "The Little Medicinal Book for All Kinds of Diseases and Infirmities of the Teeth," written by Artzney Buchlein and published in

1530, is the earliest known book devoted exclusively to dentistry. But dental treatment remained mainly archaic, with tooth extraction frequently needed to treat severe dental caries.

- ❖ **Industrial Revolution:** Dental care underwent a great deal of change throughout this time. Better dental tools and techniques were made possible by developments in technology and materials. For instance, dental surgery was transformed when John Greenwood, the dentist of George Washington, created the foot-powered dental drill in the late 1700s.
- ❖ **During the 1900s,** scientists started to acknowledge the significance of fluoride in averting dental cavities. Fluoride has been shown in studies to fortify tooth enamel and prevent the growth of microorganisms that cause tooth decay. Fluoride was consequently widely incorporated into mouthwash, toothpaste, and municipal water sources, which significantly reduced the incidence of dental cavities in many regions of the world. [29,32]
- ❖ **Modern Dentistry:** Although dental caries is still a significant issue today, there are several ways to prevent and treat cavities. These consist of root canal therapy, crowns, fillings, fluoride treatments, and dental sealants. Furthermore, dietary changes, routine dental examinations, and good oral hygiene practices all serve to lower the risk of tooth decay.

1.2 Signs and symptoms of dental carries

Dental caries, also referred to as cavities or tooth decay, can exhibit a range of symptoms. These could change according on the tooth that is damaged and how severe the decay is. Following are a few typical indications and symptoms of dental caries: [4,37]

Toothache: One of the most typical signs of dental caries is pain or discomfort in the tooth that is impacted. Chewing or exposure to hot, cold, or sugary foods and beverages can exacerbate the discomfort, which can range from mild to severe.

Tooth Sensitivity: As decay wears away the enamel, the tooth's outer coating, exposing the dentin and nerve endings beneath, there may be an increase in sensitivity to hot, cold, sweet, or acidic foods and drinks. [23,36]

Visible Holes or Pits: As the decay worsens, the surface of the affected tooth may start to show obvious holes, pits, or dark patches. These frequently signal advanced cavities.

White Spots: Chalky or white spots may appear on the tooth's surface in the early stages of decay. The enamel's demineralization signifies the cavity's early development.

Staining: Bacterial development or decay can cause discoloration or staining of the tooth surface, which can take the form of black, brown, or white patches. [1,47]

Bad Breath: Dental caries may be the cause of persistent foul breath or an unpleasant taste in the mouth, particularly if cavities are accumulating food particles and bacteria.

Pain When Biting: Pain or discomfort felt when biting or chewing could be a sign of a cavity, especially if it is confined to a single tooth.

Pus or Abscess: which are characterized by swelling, pus, or a lump on the gums next to the damaged tooth, can develop as a result of severe dental caries. This can be extremely painful and needs to be seen by a dentist right away.

1.3 Prevalence of dental caries:

Dental caries, also referred to as cavities or tooth decay, is more common in some cultures and areas of the world than in others. Nonetheless, it is widely regarded as one of the most prevalent chronic illnesses globally. The following are some important details about dental caries prevalence. [39]

Global Prevalence: People of all ages and socioeconomic backgrounds are impacted by dental caries. The World Health Organization (WHO) estimates that dental caries affects almost all people on the planet to some extent. [9,37]

Variation by Age: Although it can afflict people of all ages, dental caries seems to be more common in children and teenagers. Dental caries is one of the most prevalent chronic disorders in children, especially affecting deciduous (baby) teeth. Permanent teeth are also affected, though. [27]

Effect on Oral Health: If dental caries is not treated, it can result in discomfort, infection, tooth loss, and other oral health issues. It may also have more extensive effects on general health and well-being.

Preventive measures: Preventive measures for dental caries include fluoridating water supplies, encouraging frequent dental check-ups and cleanings, cutting back on sugar intake, and encouraging excellent oral hygiene practices (such as brushing and flossing).

Regional Variations: Between nations and areas, there might be notable differences in the prevalence of dental caries. These differences are influenced by a number of variables, including socioeconomic background, dietary practices, exposure to fluoride, and availability to dental healthcare. [29,33]

Trends throughout Time: Dental caries is still a major public health concern in many parts of the world, especially in low-income and marginalized communities, despite advancements in oral hygiene practices and preventive measures having led to reductions in its prevalence in some areas.

1.4 Risk Factors of dental Carries

There are a number of risk factors that can make someone more vulnerable to tooth decay, or dental caries. Those who are aware of these risk factors may be able to preserve good dental health by taking preventative action. The following are some typical risk factors linked to dental caries: [45]

Bad Oral Hygiene: When teeth are not sufficiently brushed and flossed, plaque, a sticky film of germs, builds up and causes tooth decay and enamel erosion.

High Consumption of Sugar and Carbohydrates: Sugar- and carb-rich foods and drinks provide oral bacteria the fuel they need to generate acids that can erode tooth enamel and cause decay.

Regular Snacking: Throughout the day, snacking, particularly on sugary or acidic foods and beverages, exposes teeth to more acids and may hasten the onset of cavities.

Absence of fluoride: Fluoride fortifies dental enamel and increases its resistance to acid erosion. The risk of dental caries can be raised by consuming insufficient amounts of fluoride or by not using toothpaste, water, or dental treatments that are fluoridated.

Dry mouth (Xerostomia): Saliva is essential for balancing oral acids and restoring tooth enamel. Tooth decay risk factors include drugs, medical treatments (like radiation therapy), and health problems (like Sjögren's syndrome) that reduce saliva production.

Acidic Foods and Drinks: Over time, consuming acidic foods and drinks, such as soda, sports drinks, and citrus fruits, can erode tooth enamel and increase the risk of tooth disease.

Bad Nutrition: Too little calcium, phosphorus, and vitamins, particularly vitamin D, in the diet can erode tooth enamel and jeopardize general oral health.

Inadequate Dental Care: Dental issues, such as cavities, can go unnoticed and untreated if patients skip out on routine cleanings and exams or visit the dentist infrequently.

Medical diseases: Because they affect saliva production and oral health, some systemic health diseases, including diabetes, eating disorders, and gastroesophageal reflux disease (GERD), might raise the risk of dental caries.

Genetics: A person's vulnerability to tooth decay can be influenced by genetic factors, which can also affect the strength of enamel, salivary composition, and oral condition predisposition.

Age: Dental caries is more common in elderly adults and children. This could occur in kids as a result of fluoride exposure, food variables, and bad dental hygiene practices. Gum recession, medication use, and dry mouth are some of the variables that can increase an older adult's risk of tooth decay.

1.5 Types of dental Carries

Caries on Smooth Surfaces: This kind of decay affects teeth with smooth, flat surfaces, including the sides of molars and premolars. If left untreated, smooth surface caries can develop gradually and frequently begin as little white patches on the enamel.

Pit and Fissure Caries: These cavities develop in the chewing surfaces of molars and premolars' deep grooves and fissures. Decomposition can result from food particles and microorganisms becoming trapped in these spaces. Although they can affect adults as well, pit and fissure caries are more common in children and teenagers.

Root Caries: When gum recession or other circumstances expose the roots of teeth, root caries can form on those exposed areas. Root surfaces are more prone to decay because they are not covered in the same layer of enamel as tooth crowns. Older persons are more likely to get root caries, especially if they have receding gums or gum disease.

Secondary Caries: Also referred to as recurrent caries, secondary caries develops around the edges of dental restorations that are already in place, such as bridges, crowns, or fillings. They appear when decay beneath the restoration results from germs entering the space between the restoration and the tooth structure. [41,43]

Early Childhood Caries (ECC): Also referred to as nursing caries or baby bottle tooth decay, ECC primarily affects newborns and young children who are permitted to fall asleep with a bottle containing sugary liquids, such as milk, formula, or juice, or who routinely ingest sugary drinks. Although it can happen on any tooth surface, ECC usually affects the upper front teeth.

Smooth Surface Fluorosis: Fluorosis is a disorder that results from consuming too much fluoride when teeth are developing. It causes the enamel to mottle and turn white or brown. If the enamel of teeth with smooth surface fluorosis becomes hypomineralized and more prone to acid erosion, teeth may be at risk for dental caries.

Ampant Caries: The term "ampant caries" describes a large-scale, quickly spreading dental disease that affects several teeth in the mouth. Dry mouth, sugary food and drink consumption on a regular basis, poor dental care, and certain medical problems are all linked to this kind of caries.

Arrested Caries: When the rate of decay is stopped or slowed down, it is known as arrested caries. This can happen as a result of dietary adjustments, fluoride applications, or preventive dental procedures like dental sealants. The impacted tooth could seem like a dark, discolored lesion and exhibit remineralization symptoms.

1.6 Management system of Dental carries

In order to stop additional decay, restore damaged teeth, and maintain general oral health, dental caries must be managed using a combination of conservative therapies, restorative procedures, and preventive measures. An outline of the dental caries management system is provided below: [44,45]

Preventive actions:

Oral hygiene: Plaque, which includes germs that cause tooth decay, can be removed by routinely brushing with fluoride toothpaste and flossing.

Fluoride: Fluoridated water, toothpaste, mouth rinses, and professional fluoride treatments are sources of this mineral, which strengthens tooth enamel.

Dietary changes: Cutting back on acidic and sugary foods and drinks lowers the chance of tooth decay. Overall oral health is supported by promoting a balanced diet high in calcium and other necessary elements.

Dental sealants: To prevent decay, sealants are thin plastic coatings that are placed on the chewing surfaces of molars and premolars. They seal up the little cracks and deep grooves where bacteria can grow.

Frequent Dental Check-ups: By identifying and tracking early indicators of decay, routine dental exams provide dentists the chance to intervene promptly.

Non-surgical Interventions:

Treatments for Fluoride: To fortify tooth enamel and prevent bacterial growth, dental caries-prone individuals may benefit from professional fluoride applications.

Remineralization Therapy: By reversing the demineralization process and stopping further decay, products containing calcium phosphate or fluoride can help promote remineralization of early-stage carious lesions.

Antibacterial Agents: To lower the amount of germs that cause cavities in the mouth, doctors may prescribe mouthwashes or gels that include antibacterial agents like chlorhexidine. [30,47]

Interventions for Restorative Practices:

Dental Fillings: Dental fillings are used to repair the structure and function of a tooth that has decayed past its initial stages. Glass ionomer cement, amalgam, and composite resin are examples of common filling materials.

Dental Crowns: Dental crowns, also known as caps, are used to cover and protect the entire visible section of a tooth above the gum line in cases of more severe decay or weakened teeth.

Root Canal Therapy: In order to remove damaged or infected tissue and seal the root canal to stop further infection, root canal therapy may be required if decay has reached the tooth's pulp, or nerve.

Extraction: To remove the afflicted tooth and stop the infection from spreading to neighboring teeth and tissues, extraction may be necessary in cases of severe decay where the tooth cannot be saved. [22,37]

Methods of Behavior and Education:

Dental hygienists and dentists offer instruction and guidance on food, lifestyle, and good oral hygiene practices that help prevent dental caries.

Promoting adherence to preventative interventions and preserving long-term oral health require patient motivation and participation.

1.7 What is understood about the oral cavity's dental caries process?

It is commonly known that the mouth experiences demineralization and remodeling, and that these processes can result in cavitation and its related clinical problems. Numerous elements of oral biology have been clarified using laboratory models. Numerous in situ investigations that validate various parts of the underlying microbiology, biochemistry, and physical chemistry have been reported. In the dentistry field, however, dental caries is still diagnosed by looking for demineralized areas, particularly cavities. Instead of acting therapeutically to stop cavitation before it starts and while the process of mineral loss is still reversible or at least arrestable, the practicing dentist "fixes caries" by drilling and filling.[43]



Figure 1: A "white spot lesion" on a tooth's proximal surface.

The so-called "white spot lesion," which is depicted in Fig. 1, is the first clinical indication that dental caries is developing in the mouth. Even though this is the first visible indication to the naked eye, the process has already been ongoing for several months.

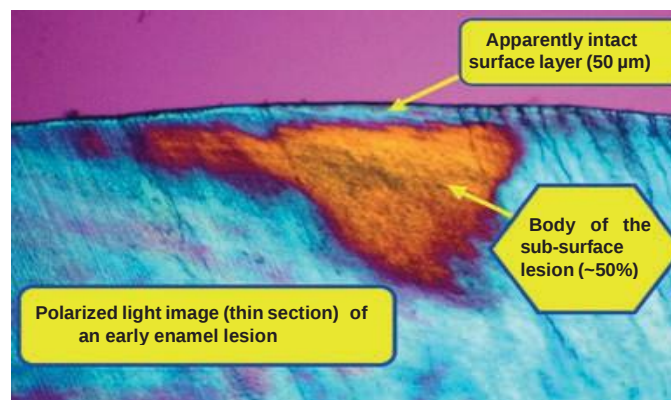


Figure 2: Under polarized light, a cross-section of an early, non-cavitated, naturally occurring early carious lesion in enamel reveals the lesion's body as well as the surface layer that appears to be intact on top of it.

Under an optical microscope, cross-sections through these early lesions can be seen, as shown in Fig 2. Radiographs can be used to clinically identify these lesions as they develop into enamel. Therapeutic intervention can halt or reverse the process by remineralization at this point in the process, before cavitation. When demineralization first begins, it can only be observed on extracted teeth in a lab setting at the electron microscopic level. The loss of minerals penetrates further into the enamel or exposed dentine as demineralization advances, and eventually it can be identified using radiography, visual inspection, or more modern optical techniques like laser-induced fluorescence. The main idea is that, particularly if a carious lesion occurs in the enamel and is not cavitated, [26,22,39]

Tooth restoration/Remineralization

The body's natural process of healing subterranean, non-cavitated carious lesions is called remineralization.⁷ The idea of recall is straightforward. Instead of forming new crystals, calcium and phosphate—mostly from saliva but also from other topical sources—diffuse into the tooth and, with the aid of fluoride, build on the remnants of existing crystals. On the other hand, the newly created crystal surface consists of a layer of well-formed mineral that, depending on the fluoride content, is probably comparable to fluorapatite. [43]

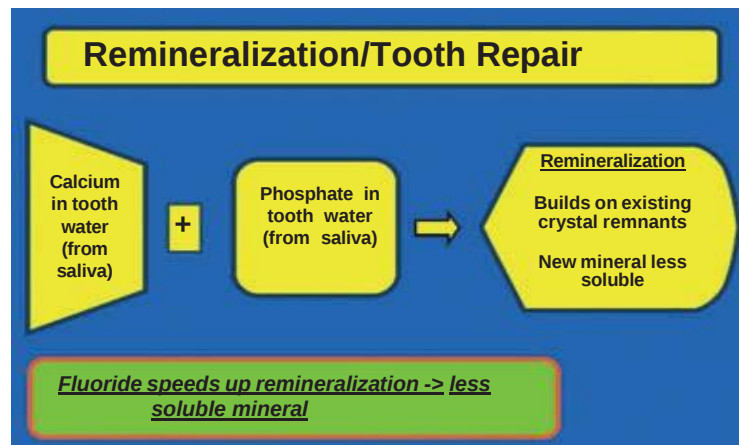
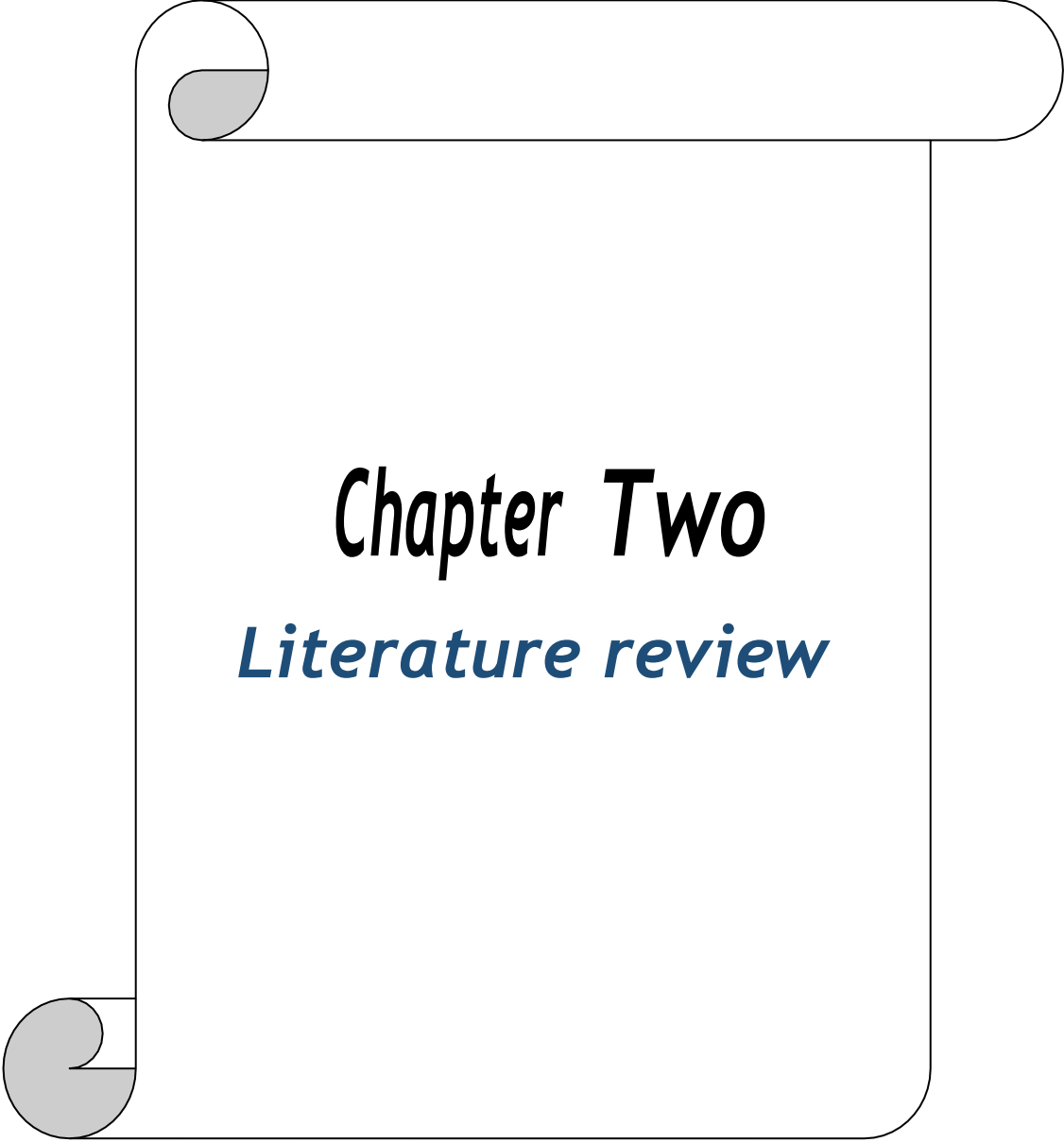


Figure 3: Diagram showing the steps involved in remineralization.



Chapter Two

Literature review

2. Literature Review

01.

Title: Dental caries: a dynamic disease process

Author: Dr JDB Featherstone Department of Preventive and Restorative Dental Sciences
University of California San Francisco, Box 0758 707 Parnassus Avenue San
Francisco, CA 94143 USA

Abstract:

Dental caries is a bacterial illness that spreads easily and dissolves minerals in enamel and dentine due to the acids produced by bacterial metabolism. When the bacterium breaks down fermentable carbohydrates, it produces organic acids as a byproduct. A series of demineralization and remineralization cycles lead to the continuum known as the caries process. If demineralization is not stopped, it can proceed until cavitation occurs at the atomic level at the crystal surface inside the enamel or dentine. There are numerous ways to get involved in this ongoing process and stop or stop the lesion's progression. Remineralization, the natural healing process for non-cavitated lesions, depends on fluoride-assisted calcium and phosphate ions to regenerate the surface of any subsurface lesions that persist after demineralization. Compared to the original mineral, these remineralized crystals are substantially less soluble and resistant to acid. [43]

02.

Title: Prevalence of Dental Caries in Children

Author: Dr. Muhammad Alam Sikder^{1*}, Dr. Tasneem Faruqui², Dr. KM Abdullah Al
Harun³, Dr. Sajjad Mahmud⁴, Dr. Radia faruqui⁵ Volume: Vol-11, Issue-1, April
2021 : 15 November 2020

Abstract:

At Osmani Medical High School, Dorgah Gate, Sylhet, Bangladesh, a cross-sectional study on oral health among school-age children was carried out. This survey was conducted on October 8, 2019, with 208 pupils enrolled in Class VI, the majority of whom were 12 years old. The primary goal of the study was to evaluate school-age children's oral health by

looking at their status for decaying, missing, and filled teeth (DMFT). Personal interviews and in-person clinical examinations of the respondents were used to gather data. Of the 208 kids, 112 (53.8%) were girls and 96 (46.2%) were males. Of all the respondents, 63 (or 30.3%) brushed their teeth once a day, 137 (or 65.9%) twice a day, and 8 (or 3.8%) more frequently than twice a day. Of the pupils, 73 (35.1%) use toothpaste that contains fluoride, 112 (53.8%) are unsure if their toothpaste contains fluoride, and 23 (11.1%) do not use fluoride. Of all the responders, 125 (60.09 %) had no tooth decay, 83 (39.90 %) had tooth decay, and 20 (9.6%) received dental fillings. 185 (88.94%) of the individuals showed normal gingival health, whereas 23 (11.06%) of them exhibited red or swollen gingiva. The study population's mean DMFT was 1.19, a value deemed "low" by the WHO's measurement system for the DMFT index. [44]

03.

Title: Prevalence of Dental Caries, Oral Hygiene Status, and Associated Risk Factors
Among Schoolgoing Children of Rajshahi District in Bangladesh

Author: Abul Kalam Mohammad Asad,¹ Ranjan Kumar Barman,² Md. Munimul Huq,³
Mir Nowazesh Ali,⁴ Mir Imam Ibne Wahed ⁵ TAJ June 2022; Volume 35
Number-1

Abstract:

One of the most common and chronic oral disorders, especially in children, is dental caries, which has multiple contributing factors. The purpose of the study was to ascertain the prevalence of dental caries, the state of oral hygiene, and the risk factors associated with it in Bangladesh's Rajshahi District among school-age children. Methods: Children in the Rajshahi district who were enrolled in primary school, aged 5 to 13, participated in this descriptive study using a cross-sectional approach. 2000 people made up the sample, and they were chosen on purpose. A questionnaire that was only partially structured was used to gather data. The standard deviation and mean were used to describe the descriptive variables. To determine the association with qualitative factors, the Chi-square test was used. Applying pertinent statistical tests at a suitable probability level ($p < 0.05$ or < 0.01) revealed statistical significance. Findings: Two thousand kids aged five to thirteen took part in this survey. The study's conclusions demonstrated that dental caries was highly

prevalent in school-age children (8 to 10 years old). The majority of respondents' mothers (86.3%) were homemakers, and the majority of respondents' fathers (56.9%) were employed. It was discovered that the educational attainment of 64.2% of the respondents' fathers and 74.05% of the respondents' mothers fell below the SSC level. A significant portion of the respondents (81.0%) washed their teeth before breakfast, and about 60% of them did so twice a day. 45.6% of the respondents reported average oral hygiene, and the majority (68.80%) had a family history of dental issues. Junk food ranked highly among the respondents' preferred foods (49.6%). Age of the respondents was shown to be statistically significant ($p < 0.001$) in connection to oral hygiene status, but not to sex, parents' educational attainment, or occupation ($p > 0.05$ for each). The respondents' oral hygiene status was found to be statistically significantly correlated with their most favorite food ($p < .001$), dental caries index ($p < 0.001$), family history of dental problems ($p < 0.05$), frequency of tooth brushing ($p < 0.05$), and time of tooth brushing ($p < 0.01$). In conclusion: In Bangladesh's Rajshahi area, school-age children had a greater prevalence of dental caries. [45]

04.

Title: Prevalence of Dental Caries among 10-17 Years Old Children of a Selected School
Narayanganj, Dhaka

Author: Dr. Alvee Rahman^{1*}, Dr. Fatema Tabassum Anam², Saima Nur³ Published:
07.01.2023

Abstract:

Introduction: Worldwide, 60–90% of children suffer from dental caries, making it the most prevalent and frequent condition. Because dental caries subsequently causes delayed language development, eating disorders, edentulism, and tooth pain and discomfort. Since 80% of kids attend lower secondary school, it would be beneficial to have preventative dental health treatments available in schools to keep kids healthy and prepared to learn about oral illnesses.

The purpose of this study was to determine the prevalence of dental caries in students aged 10 to 17 enrolled in a particular Narayanganj school.

Methods: On February 6, 2016, a cross-sectional study of a descriptive nature was carried out at Follah Pilot High School in Narayanganj, Dhaka.

Result: 252 kids in all finished the study. Out of the 252 individuals in total, 58 were boys and 194 were girls, according to our study. 53.97% of people had dental cavities overall, with 27.20% of boys and 72.79% of girls affected. In 2000, the Global Goals for Oral Health were created, with the aim of bringing the 12-year-old SiC index down to less than 3 DMFT globally by 2015. The youngsters in the age group (10–17) had a mean DMFT value of 0.7. Also, we discovered that the maxillary caries rate is 32.35%, whereas the mandibular caries rate is 67.65%. The maxillary caries rate for boys is 45.94%, whereas it is only 28.12% for girls. Additionally, when it comes to girls, the

In conclusion, the prevalence of dental caries is lower in Bangladesh's rural areas than it is in its metropolitan ones. We also found it to be satisfactory in this study. However, as rural regions continue to expand, so does the consumption of fast food and chocolate, which will eventually lead to a rise in the occurrence of dental cavities if oral hygiene education is not included in school curricula. [46]

05.

Title: Sucrose and dental caries: a review of the evidence

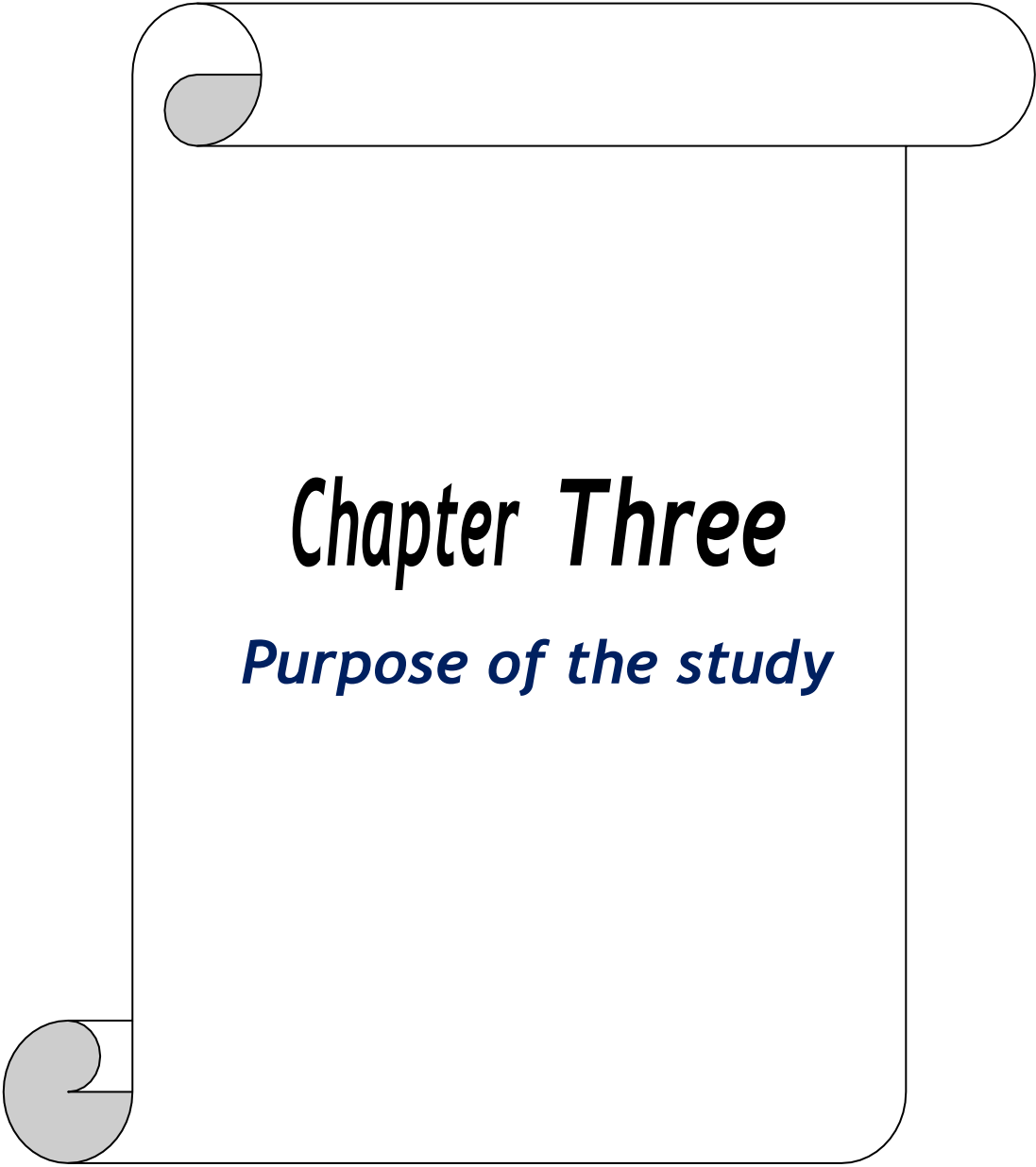
Author: C. A. Anderson, M. E. J. Curzon, C. Van Loveren, C. Tatsi and M. S. Duggal

Abstract:

The purpose of this study was to perform a review of the literature in order to evaluate the connection between dental caries and the quantity and pattern of sugar consumption. The literature was searched for epidemiological publications about any connection between sweets and dental caries published since 1856 using both manual and electronic approaches (MEDLINE, EMBASE). In 1856–1840, there was superficial hand searching; in 1940–1966, there was extensive hand searching; and in 1966–2007, there was electronic searching. Cochran style standards were used as a basis for selection criteria, although they were not the only ones.

The investigations were divided into four categories: A, which met all requirements; B1, which was relevant and met 19 out of 23 criteria; B2, which was relevant but only met 12 to 18 of the selection criteria; and C, which included all other articles. Ninety-five papers

fulfilled all or most of the twelve chosen criteria. Out of 31 papers, just one received an A. Additionally, about 65 were deleted as B2 and the remaining ones as C. Numerous study designs were used; of those that were rated as A or B1, 23 ecological cross-sectional, 7 cohort, and 2 case control studies were included. The summary findings indicated that six research demonstrated a positive, significant association between the quantity of sugar consumed and dental caries, while 19 out of 31 studies observed a significant relationship between the frequency of sugar usage and dental caries. The remaining research shows that there is a somewhat substantial correlation between sugar frequency and dental caries rather than a relationship between sugar quantity. [47]



Chapter Three

Purpose of the study

3. Purpose of the study

Depending on the particular objectives of the survey, a dental caries (tooth decay) survey may have several purposes. Nonetheless, the following are some typical goals of dental caries research:

- ✓ **To Identify the Casus.**
- ✓ **To find out the diagnostics procedure.**
- ✓ **To observe the complication.**
- ✓ **Find out the prevalence.**

Comprehending prevalence and risk factors: A survey may aim to ascertain the frequency of dental caries within a certain demographic or area and pinpoint the elements that foster its advancement. This may facilitate more effective targeting of therapies and preventative actions.

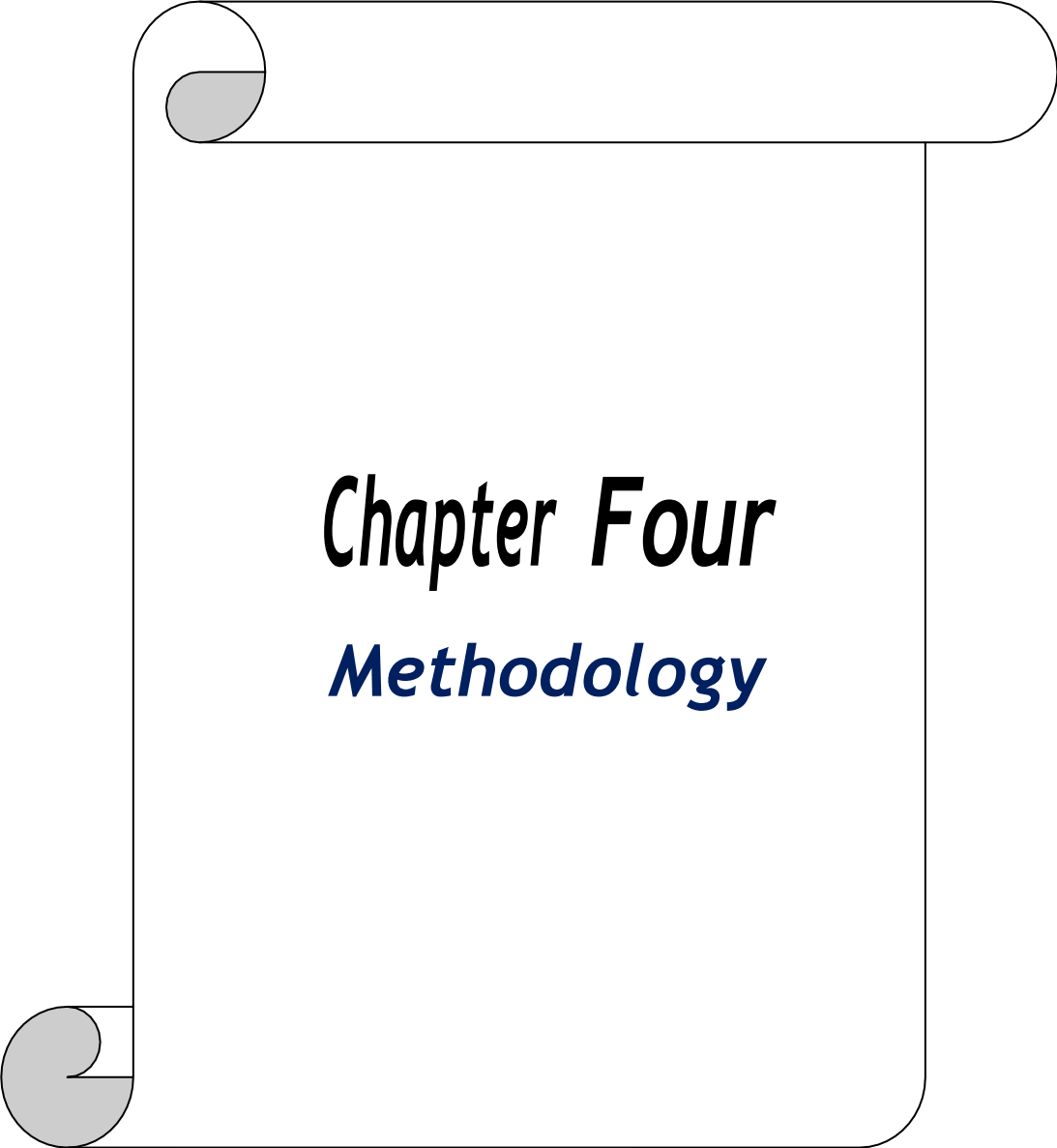
Assessing oral health status: In order to inform public health policies and oral health programs, surveys on dental caries frequently seek to evaluate the oral health condition of people or groups, including the severity and distribution of caries lesions.

Assessing interventions and treatments: Research may be done to determine which interventions and treatments are most useful in controlling and preventing dental caries. This can entail assessing the effectiveness of behavioral therapies, dental sealants, and fluoride supplements.

Examining behavioral and socioeconomic aspects: A survey may look at the oral hygiene routine, food, socioeconomic status, and availability of dental care as well as other behavioral and socioeconomic factors that affect dental caries risk.

Creating preventative strategies: Dental caries surveys can help with the creation of policies and programs meant to lower the frequency and severity of tooth decay. This could entail regulatory changes pertaining to sugar intake or water fluoridation, as well as community-based interventions and educational initiatives.

The overall goals of survey dental caries are to further our knowledge of this widespread oral health issue, pinpoint practical preventative and therapeutic approaches, and eventually improve people's oral health and general well-being.



Chapter Four

Methodology

4. Methodology

4.1 Introduction:

There is a review at the beginning of the questionnaire, followed by 34 pertinent questions. In this study, 221 patient workers participated.

4.2 Location:

Sapporo Dental College and Hospital, Dhaka served as the site of this investigation.

The location is in Bangladesh's Plot no 24. Sector 8, Uttara
Dhaka 1230, Dhaka.

4.3. Research Design:

I'm doing this survey to find out what people think about Dental carries and how it affects their life. The was a completely physical-based cross-sectional study This investigation was conducted during the patient's visit to the doctor's office. It took around one months to complete the study.

4.4 Questions

01. Name?

02. Age?

- a) 7–10
- b) 11–14
- c) Others

03. Sex?

- a) Male
- b) Female
- c) Prefer not to say

04. Religion?

- a) Muslim
- b) Hindu
- c) Christian
- d) Others

07. Consumption of sweet food?

- a) Yes
- b) No

08. Frequency of consumption?

- a) Daily
- b) 2-3*days
- c) Once a week

09. Bottle food childhood?

- a) Yes
- b) No

10. Drink soft drinks?

- a) Yes
- b) No

11. Teeth brush habit?

- a) Yes
- b) No

12. Frequency of bushing?

- a) Twice/day
- b) Once/day
- c) Sometime

13. Material use to clean?

- a) Tooth brush
- b) Local chew stick

14. Toothpaste use?

- a) Yes
- b) No

15. Parent insistence?

- a) Yes
- b) No

16. Dental aches?

- a) Yes
- b) No

17. School health education?

- a) Yes
- b) No

18. Habit mouth wash?

- a) Yes
- b) No

19. Experience of having caries. Did they have any symptoms? What's that?

- a) Visible holes in the teeth
- b) Toothache or tooth pain
- c) Sensitivity to hot, cold
- d) Tooth sensitivity to pressure or touch
- e) Pain or discomfort when brushing teeth
- f) Bad breath or an unpleasant taste in the mouth
- g) Black spot on tooth
- h) Cavity present
- i) Visible holes in the teeth
- j) Sensitivity to hot, cold
- k) Toothache or tooth pain
- l) Tooth sensitivity to pressure or touch
- m) Pain or discomfort when brushing teeth
- n) Bad breath or an unpleasant taste in the mouth
- o) Black spot on tooth
- p) pocket

20. What do they think it looks like?

21. Did it stop them doing anything?

- a) Yes
- b) No

22. Going to the dental hospital, what was that for?

23. Have you experienced any pain or discomfort due to dental caries?

- a) Yes
- b) No

24. Have dental caries affected your ability to eat, speak, or carry out daily activities?

- a) Yes
- b) No

25. How often do you visit a dentist for check-ups or treatment?

26. Do you have any chronic health conditions (e.g., diabetes, autoimmune diseases) that may affect your oral health?

- a) Yes
- b) No

27. What medicines do you take for dental caries?

28. Has it required any type of medical surgery?

- a) Yes
- b) No

29. Did it completely clear up after treatment or did it come back?

- a) Yes
- b) No

30. Have you undergone any medical treatments or surgeries that may have impacted your oral health?

- a) Yes
- b) No

31. Do you follow any specific dietary practices that promote oral health (e.g., avoiding sugary foods, consuming dairy products)?

- a) Yes
- b) No

32. What do you perceive as the most effective ways to prevent dental caries?

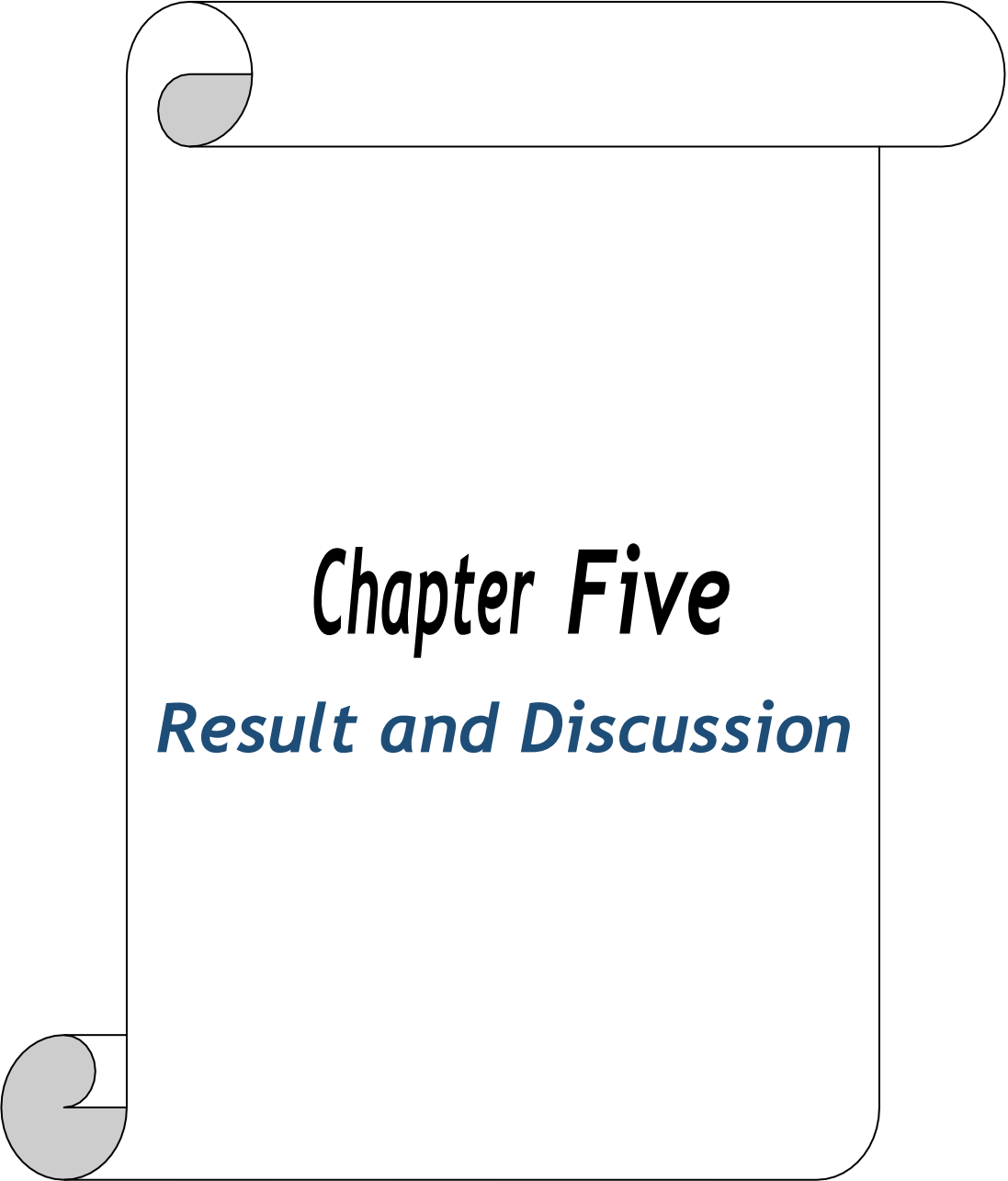
- a) Brushing Twice a Day
- b) Limiting Sugary and Acidic Foods
- c) Using Fluoride Products
- d) Wash with water sometimes
- e) Regular Dental Check-Ups
- f) Regular Dental Check-Ups

33. Do you face any barriers to accessing dental care services (e.g., cost, transportation, availability)?

- a) Yes
- b) No

34. Are you satisfied with the quality of dental care services provided at this hospital?

- a) Yes
- b) No



Chapter Five

Result and Discussion

5. Result & Discussion

The Sapporo Dental College and Hospital in Dhaka conducted this analysis of patterns in the prescription of dental care. 221 patient prescriptions were looked over for the purposes of this study.

5.1 Gender

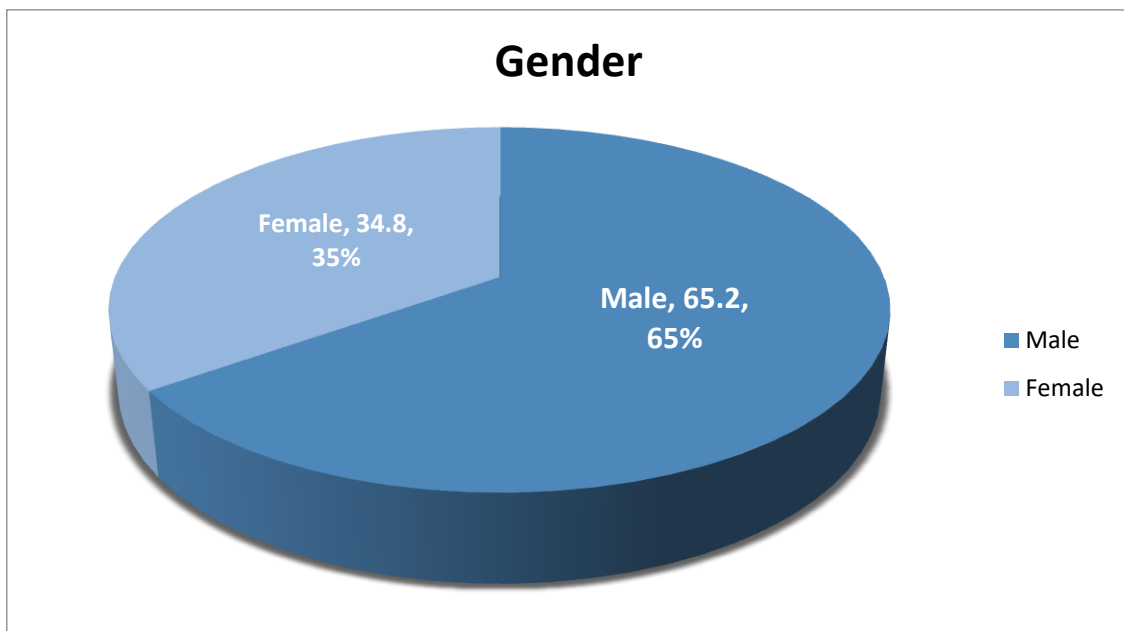


Figure: 5.1 Pie chart of gender

The bulk of the data in this inquiry came from 65% of the patients who were male; the remaining 35% were female. Most of the people are man.

5.2 Age

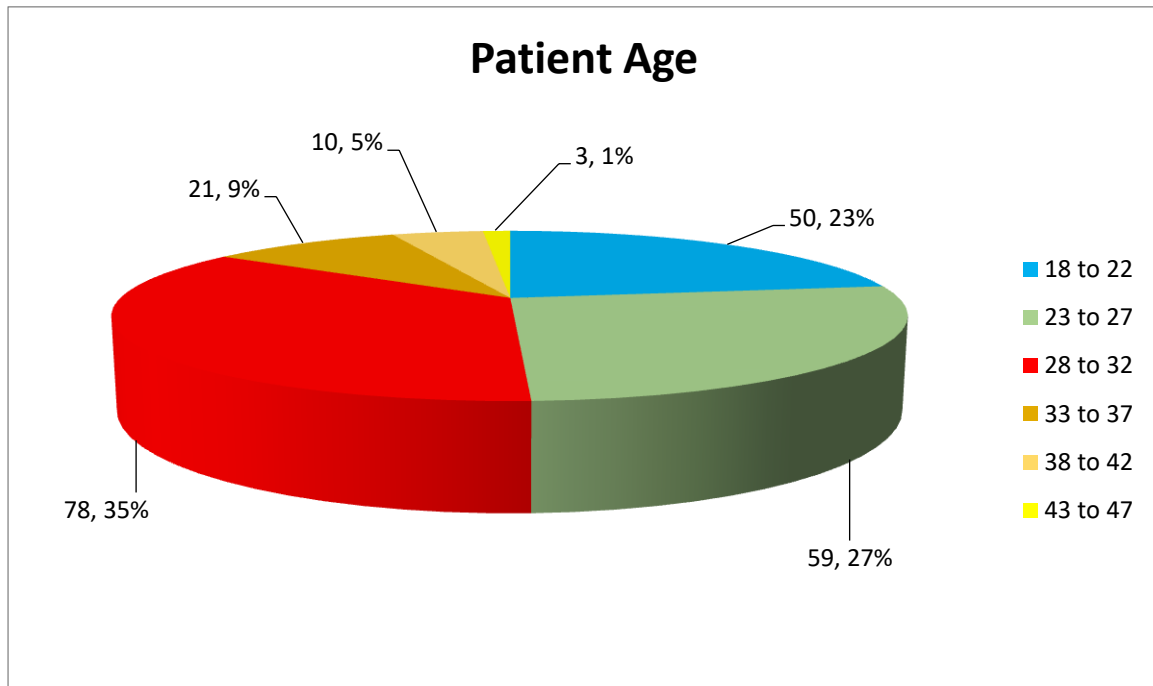


Figure:5.2 Column Chart of Age

This study looked at how age variations affect the dental carrier problem. The age group spanning from 28 to 32 had the most percentages (35), while the age group spanning from 43 to 47 had the lowest percentage (1%).

5.3 Religion:

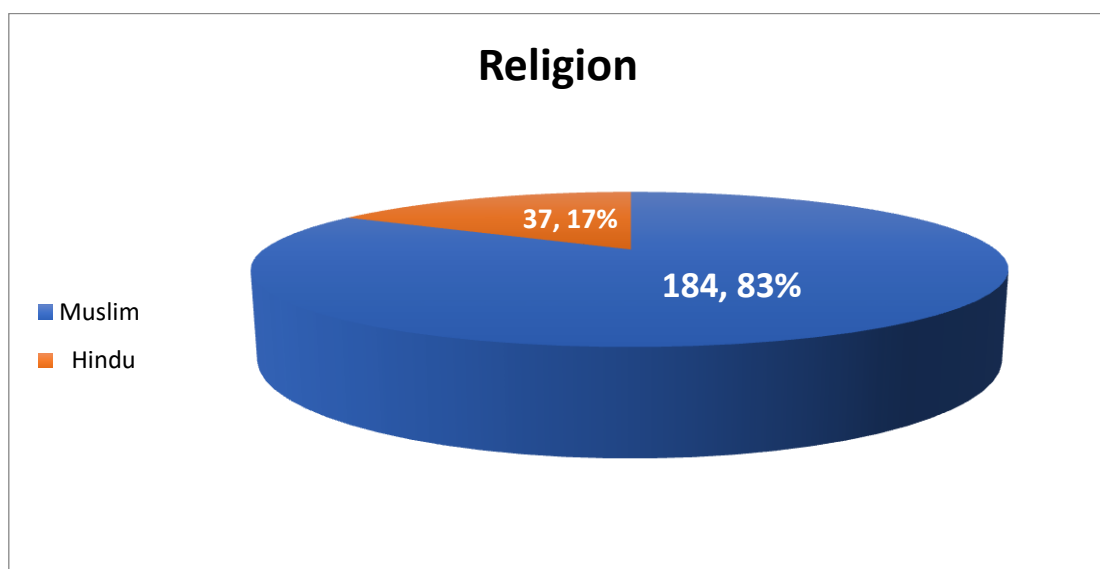


Figure5.3: Column chart of Religion

Out of total 221 patients, 184 are Muslims. 83% and 37 are Hindus. 17%. Most patients are Muslim.

5.4 Consumption of sweet food

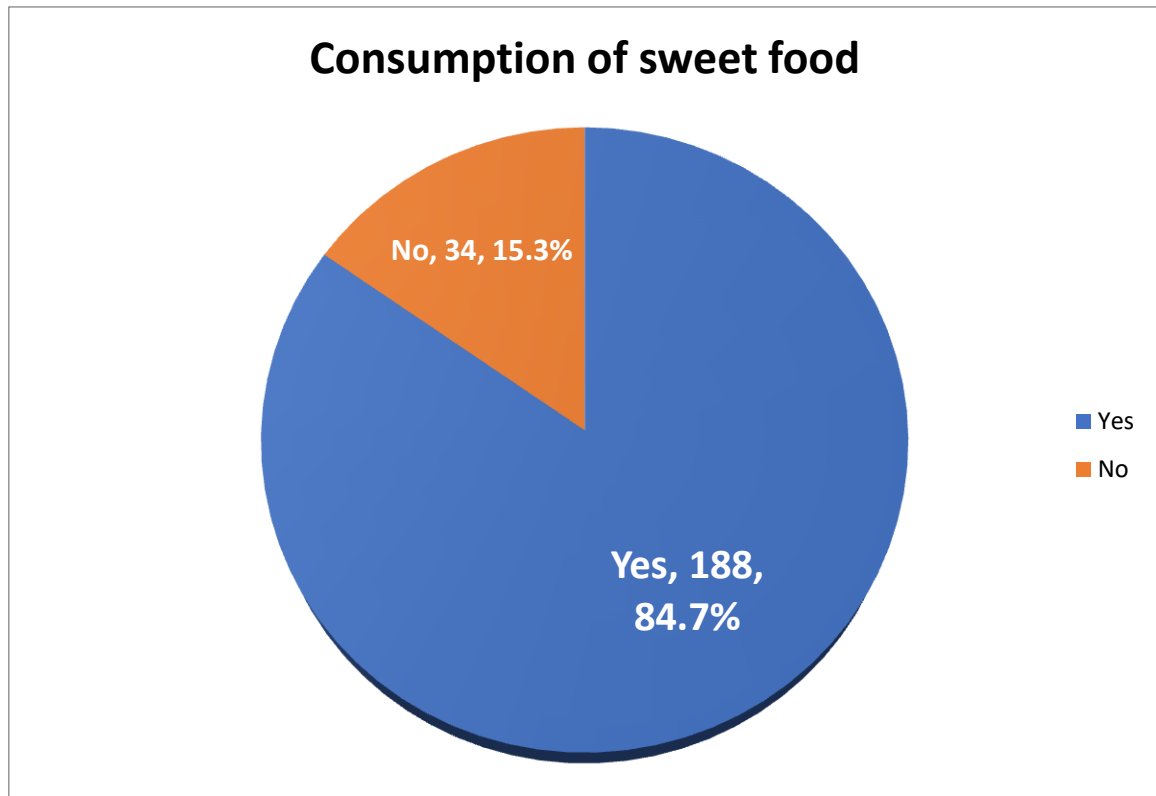


Figure5.4: Pie chart of Consumption of sweet food

Out of 21 patients, 188, 84.7% people eat sweet foods and 15.3% people i.e. 34 people do not eat sweet food. So I can say that people who consume sugary food have more dental problems.

5.5 Frequency of consumption sweet food

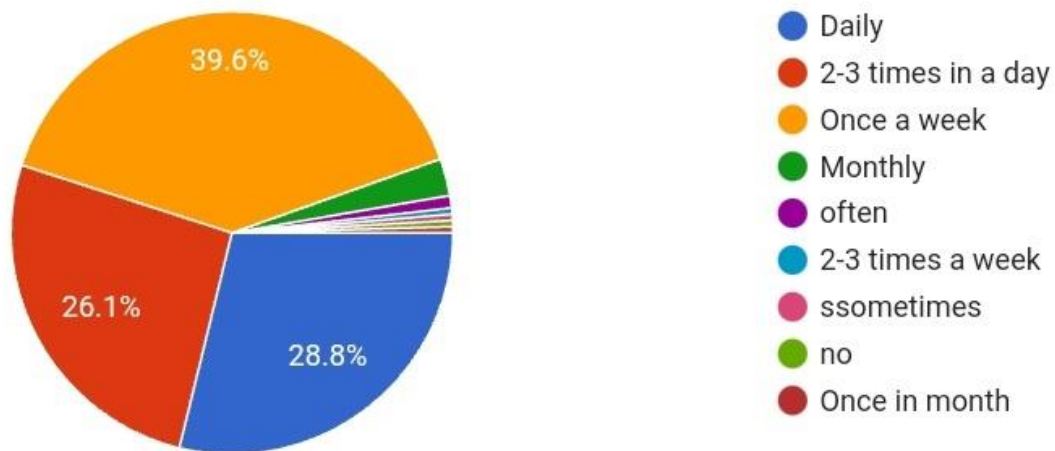


Figure5.5: Pie chart of Frequency of Consumption sweet food

Find that most people eat sweets at least once a week with 39.6% and the rest almost always. Which is one of the causes of tooth loss.

5.6 Take Bottle food childhood

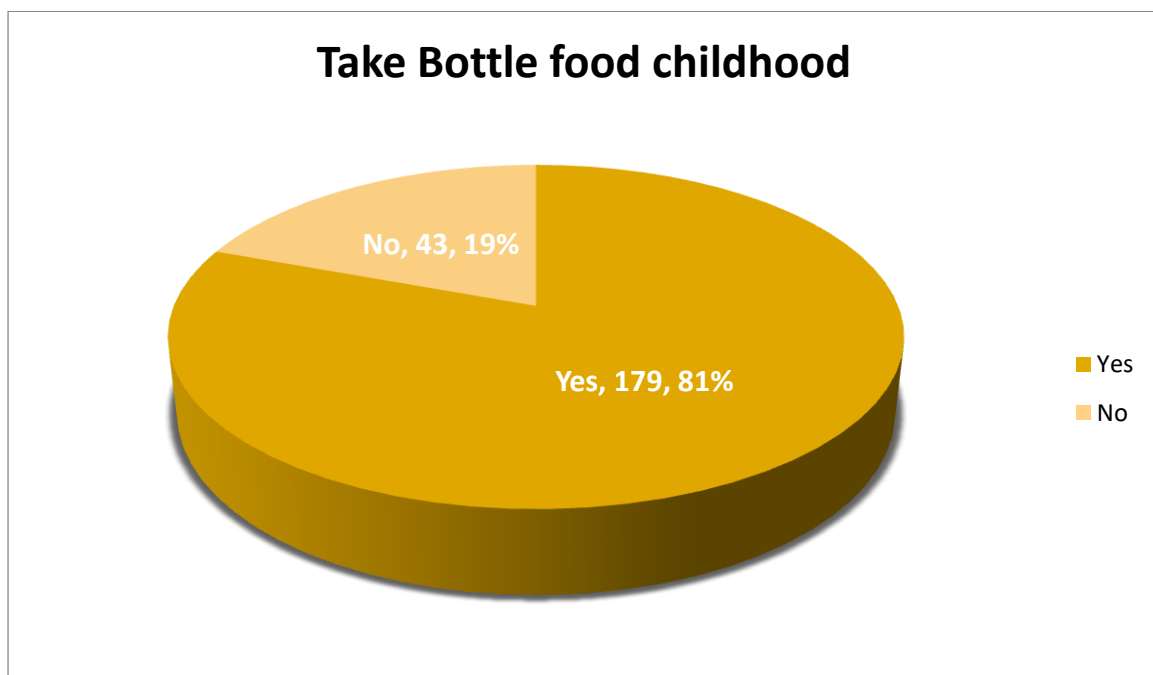


Figure5.6: Pie chart of Bottle Food Childhood

Surprisingly, out of 221 people, 179 people have been drinking bottled water since childhood. Still drinking bottled drinks regularly or occasionally is one of the main causes of tooth loss.

5.7 Take soft drinks

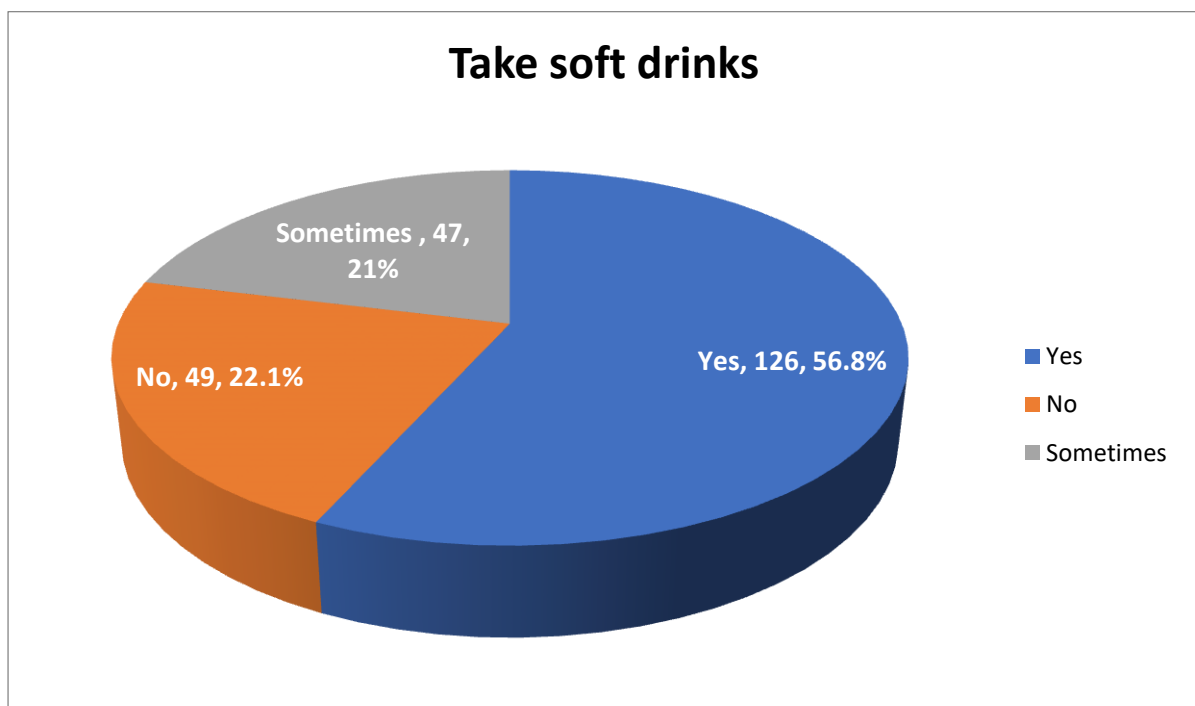


Figure5.7: Pie chart of Take Soft Drinks

126 patient (56.8%) take soft drinks, 49, 22.1% didn't take soft drinks, 47 patient sometimes take soft drinks. The number of people drinking soft drinks is high. It contains sugar which is one of the reasons for dental problems.

5.8 Teeth brush habit

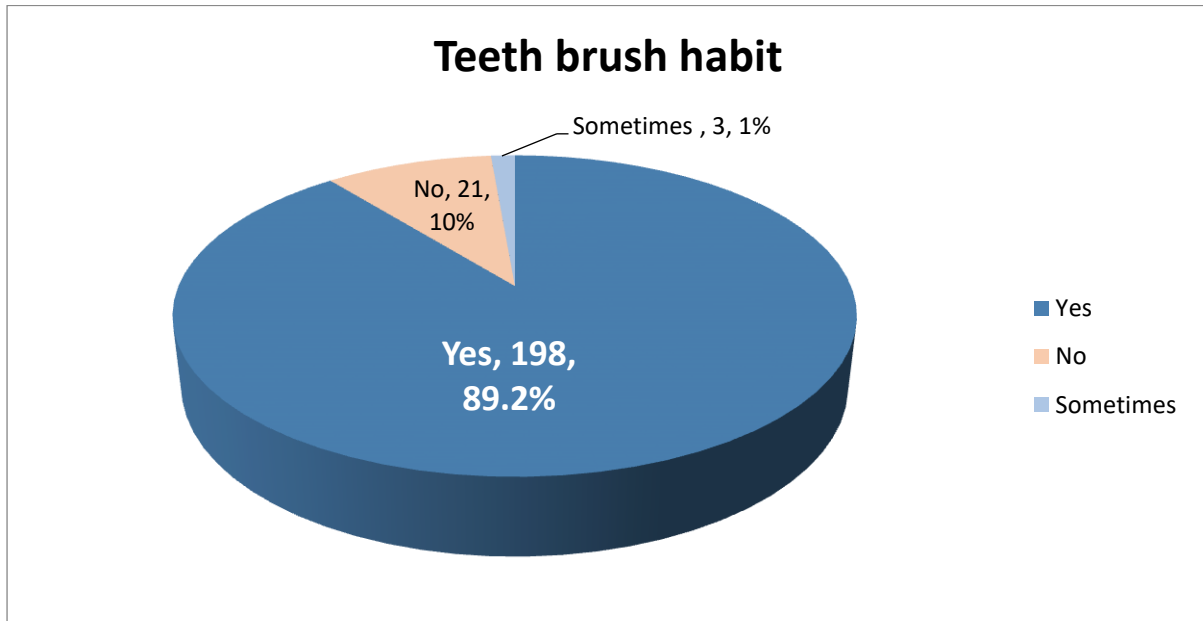


Figure5.8: Pie chart of Teeth brush habit

198 people brush regularly, 21 people do not and three people do it occasionally. The ratio of which is 89.2, 10 and 1.4. Everyone is very conscious and they brush regularly for their dental health.

5.9 Frequency of brushing Teeth

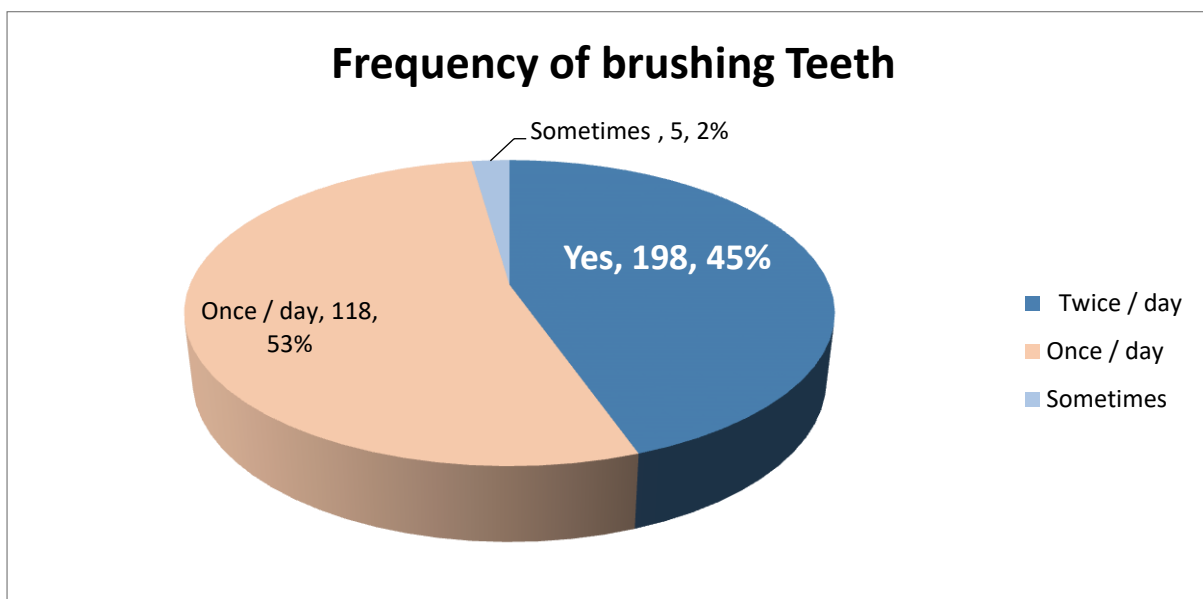


Figure5.9: Pie chart of Frequency of brushing Teeth

Most people brush once a day which is 53%, 118 people. Some people brush twice a day that is 45%, 198 people. Some people brush infrequently with very little. Most people do the amount of brushing that should be done to maintain regular dental health.

5.10 Material use to clean teeth

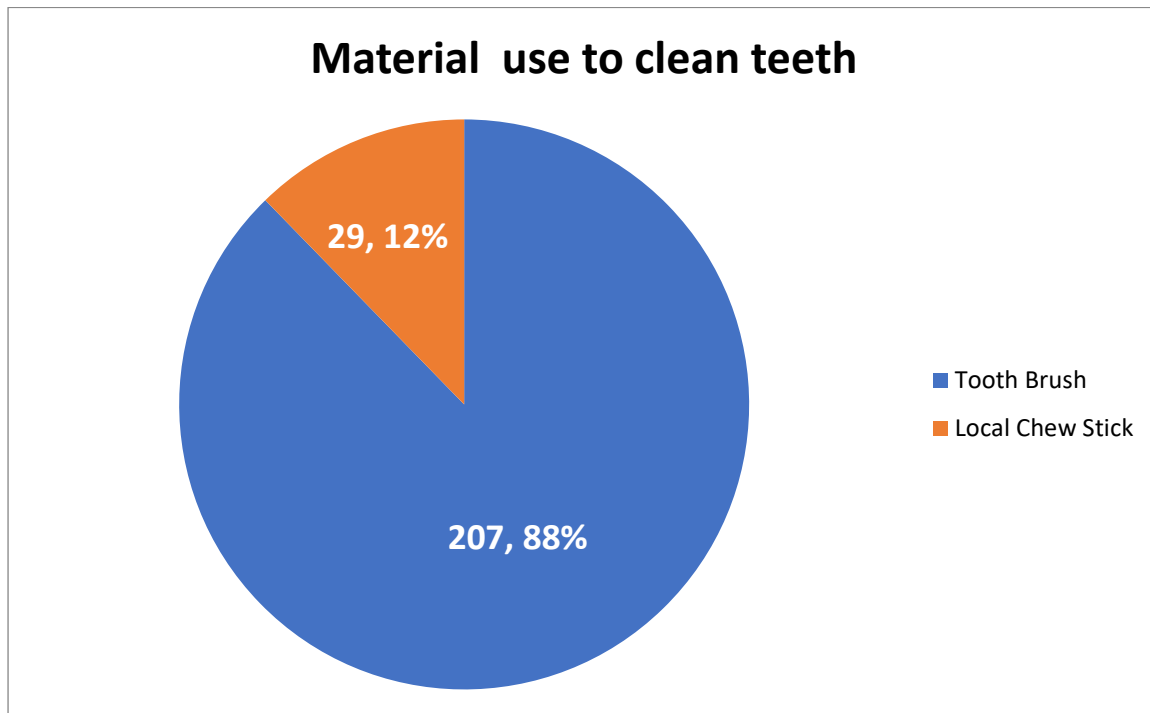


Figure5.10: Chart of Material use to clean teeth

207 people brush regularly using a toothbrush. Which amounts to 207 people or 88%. Others clean their teeth in other ways. The amount is 12 percent ie 29 people

5.11 Toothpaste Use

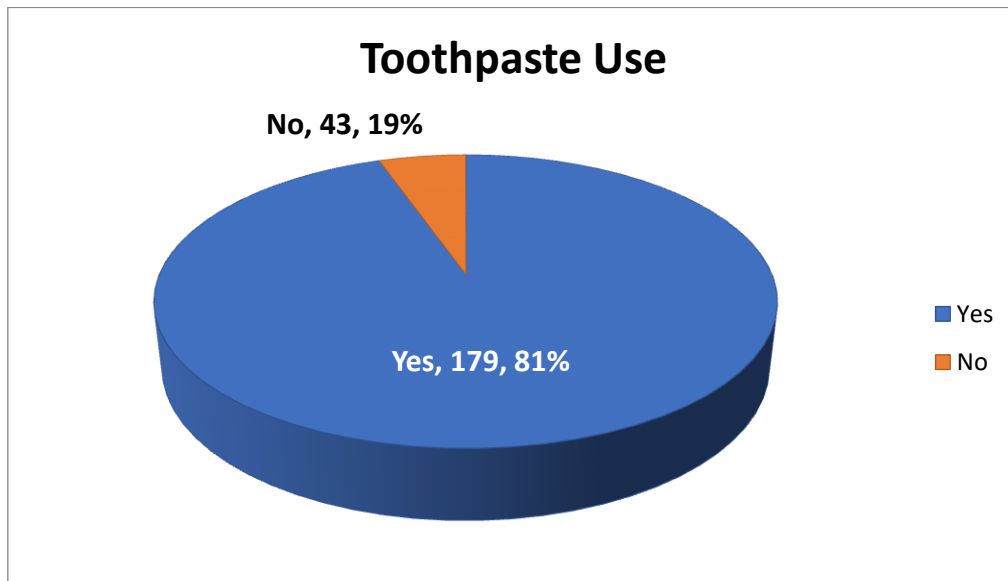


Figure5.11: Pie chart of Toothpaste use

179 people using a toothpaste. Which amounts to 179 people or 81%. Others clean their teeth in other ways. The amount is 19 percent ie 43 people

5.12 Parents insistence to clean the teeth

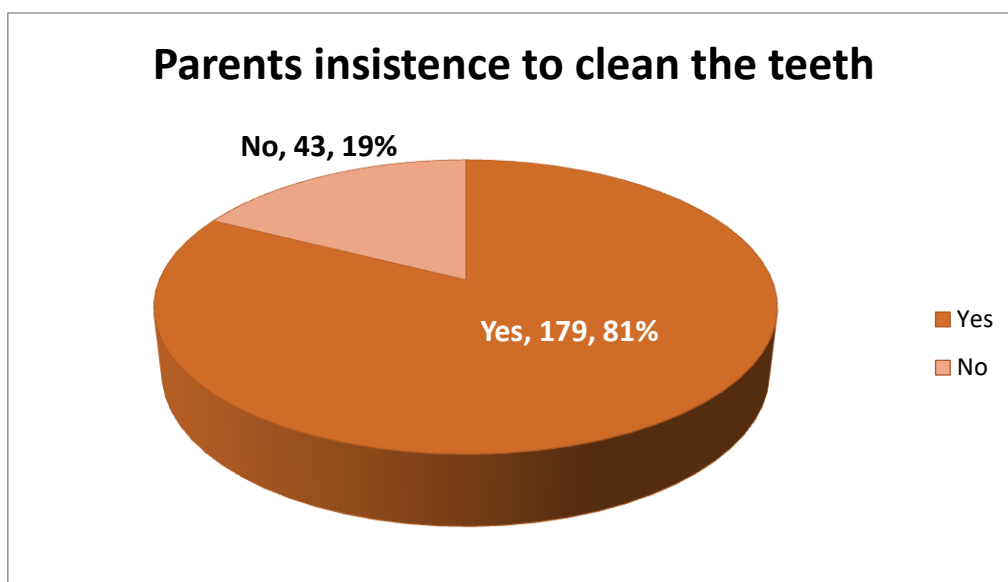


Figure5.12: Pie chart of Parents insistence to clean the teeth

Find that focusing on dental care from an early age. In that case parents play an important role. In most cases, we have seen that parents play an important role. 81% of people were directly encouraged by their parents to take care of them.

5.13 School health education about Dental Carries

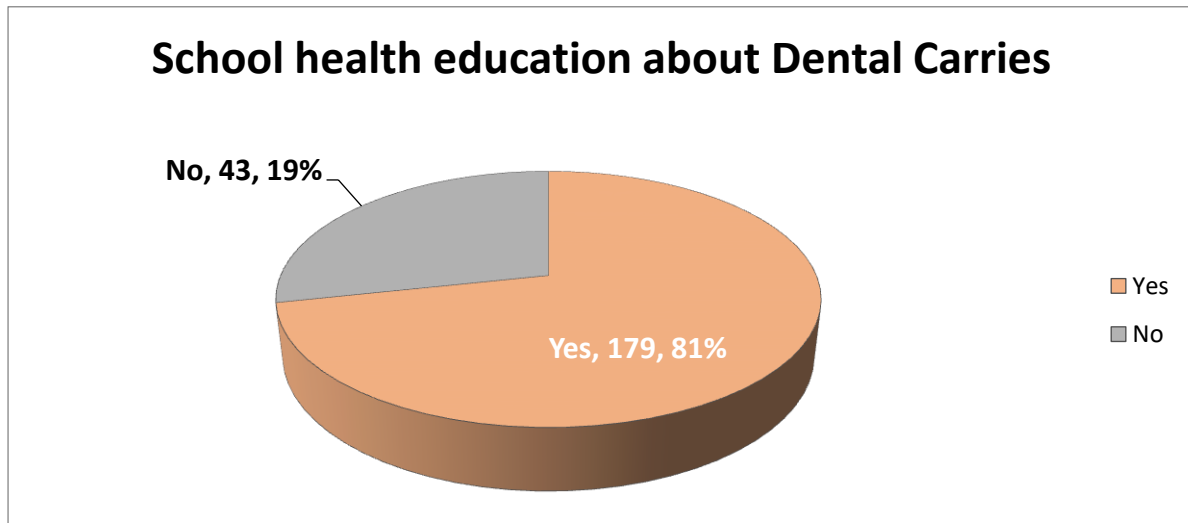


Figure5.13: School health education about Dental Carries

In most cases, I have noticed that dental health protection is taught to people in school. 19 percent i.e. 43 people are away from this type of management. But the majority of 179 people i.e. 81 percent people received necessary guidance about dental health protection from school.

5.14 Habit to use mouth wash

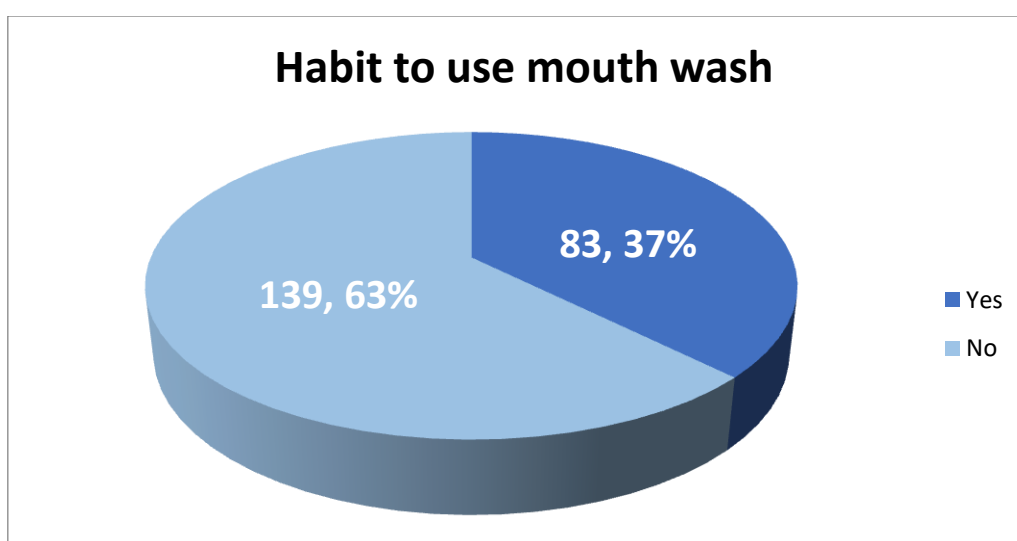


Figure5.14: Habit to use mouth wash

I found that most people are aware of dental health but do not use mouthwash. The highest number is 139 people or 63 percent. Some people 83 or 37 % use mouth wash.

5.15 Experience of having caries, symptoms

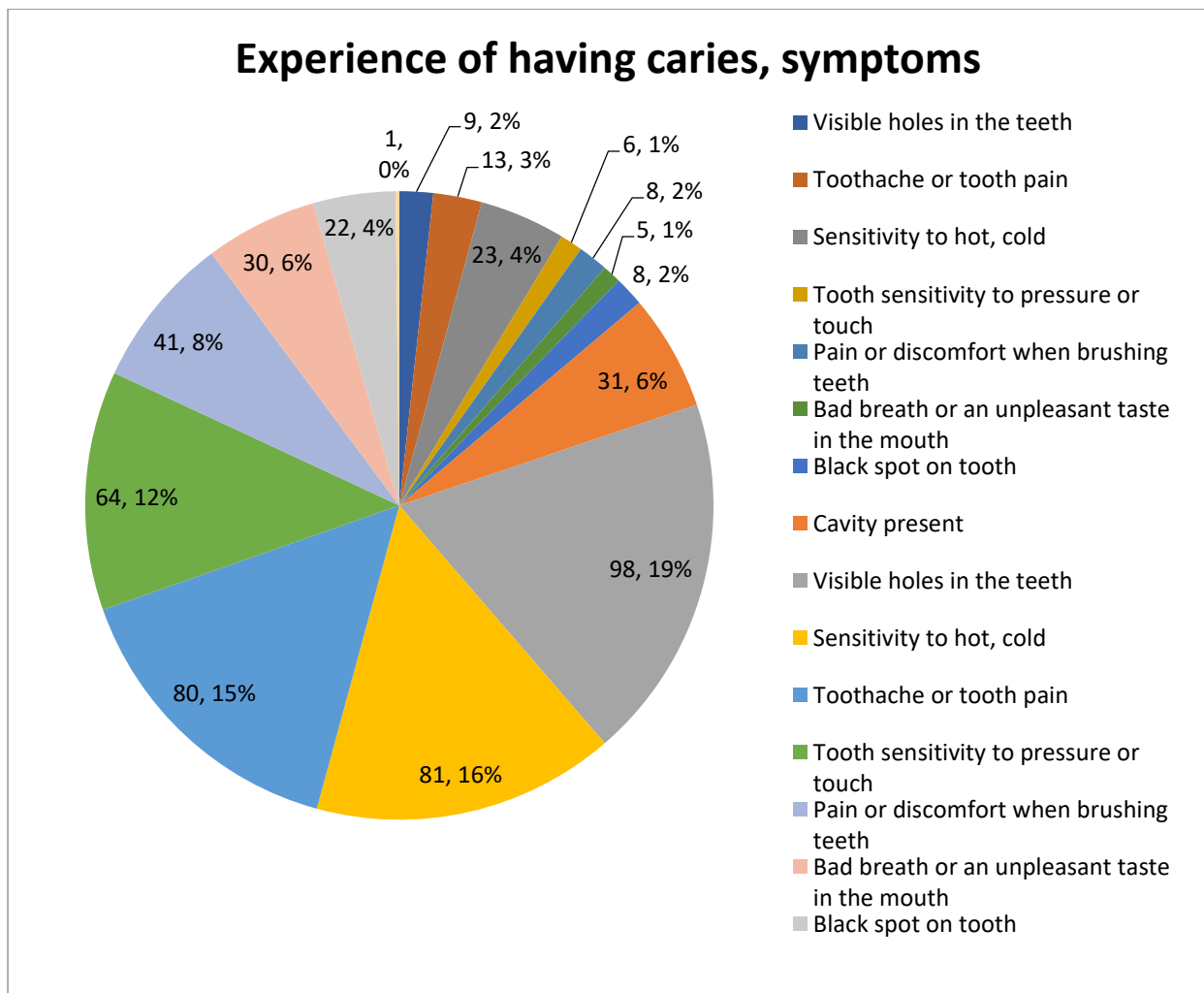


Figure5.15: Experience of having caries, symptoms

A variety of symptoms of dental problems have been realized by me talking to patients. There were various symptoms like tooth decay, tooth pain, bleeding from teeth, black spots on teeth, Bad breath or an unpleasant taste in the mouth, But the most I found was that about Visible holes in the teeth 98 people, Toothache or tooth pain 80 people. Tooth sensitivity to pressure or touch 64 people, Pain or discomfort when brushing teeth 41 people

5.16 They think Dental Caries looks like

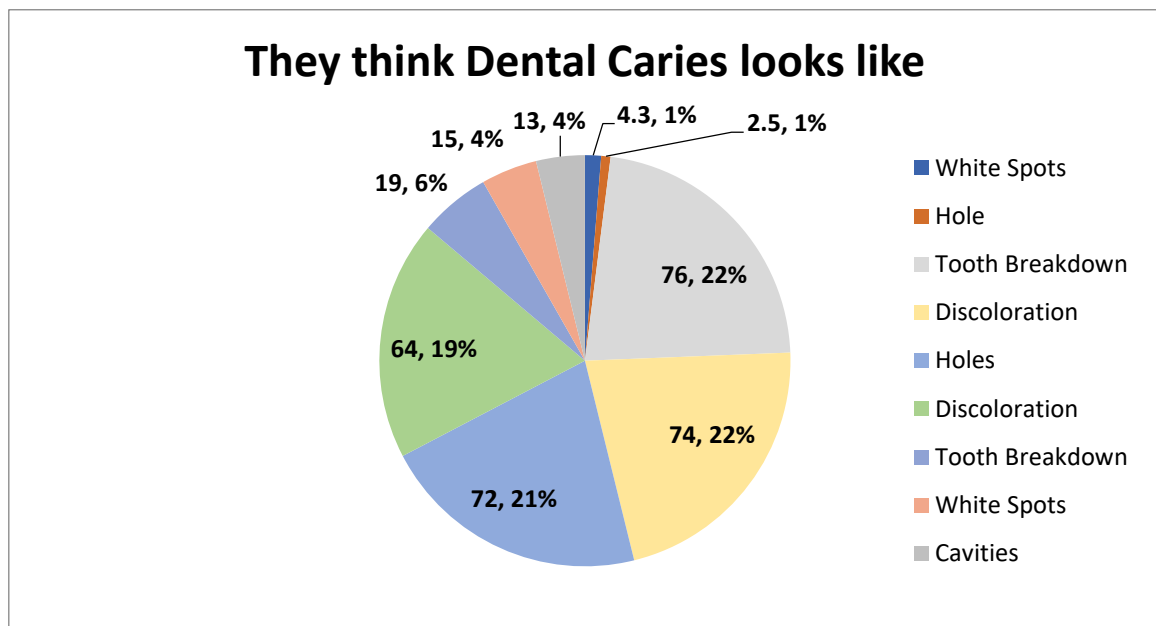


Figure5.16: They think Dental Caries looks like

Most people who suffer from dental problems do not really know what this dental disease looks like. They think of white spots, cavities, broken teeth, discoloration of teeth, but most of the time what they think of is cavities 74(28.8%) and tooth decay(72,26.6%)

5.17 Did they stop them doing anything to stop the dental Caries

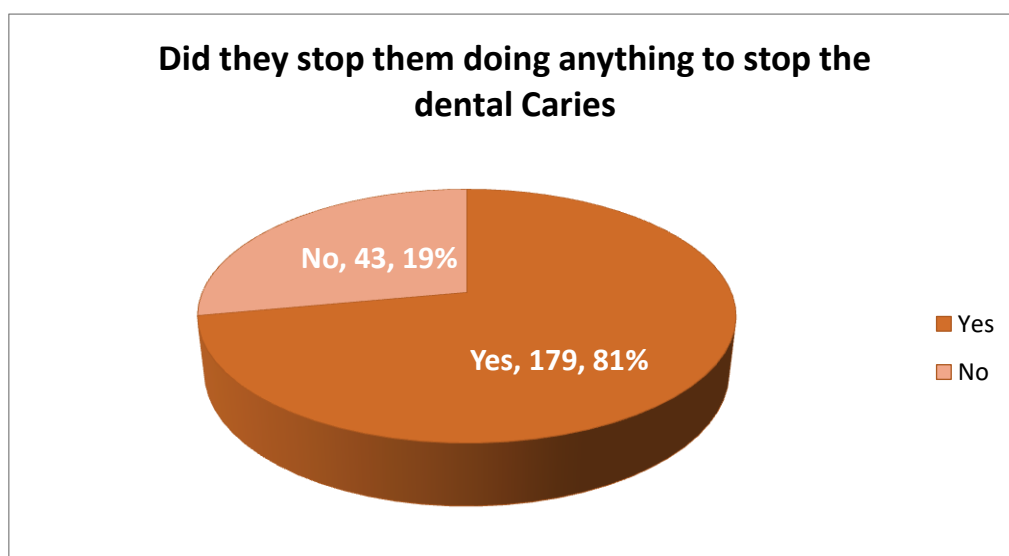


Figure5.17: Did they stop them doing anything to stop the dental Caries

People who suffer from dental problems take steps to stop it in the first place. About 179 people 81 percent have taken shelter of Dr. The remaining 43 people are 19% of people did nothing at first to cure it.

5.18 Experienced any pain or discomfort due to dental caries

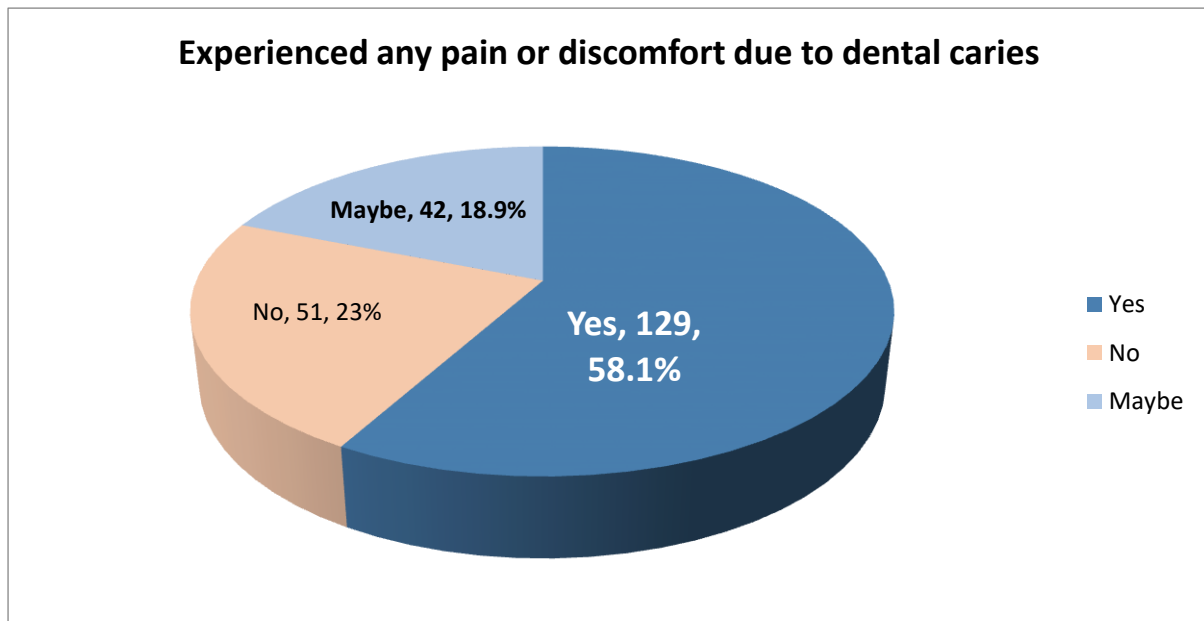


Figure5.18: Experienced any pain or discomfort due to dental caries

Those who suffer from dental problems mostly feel mouth pain and nausea which is 129 people or 58.1 percent. And 51 people do not feel pain in mouth. 42 people think they may or sometimes feel pain.

5.19 Dental, caries affected ability to eat speak, or carry out daily activities

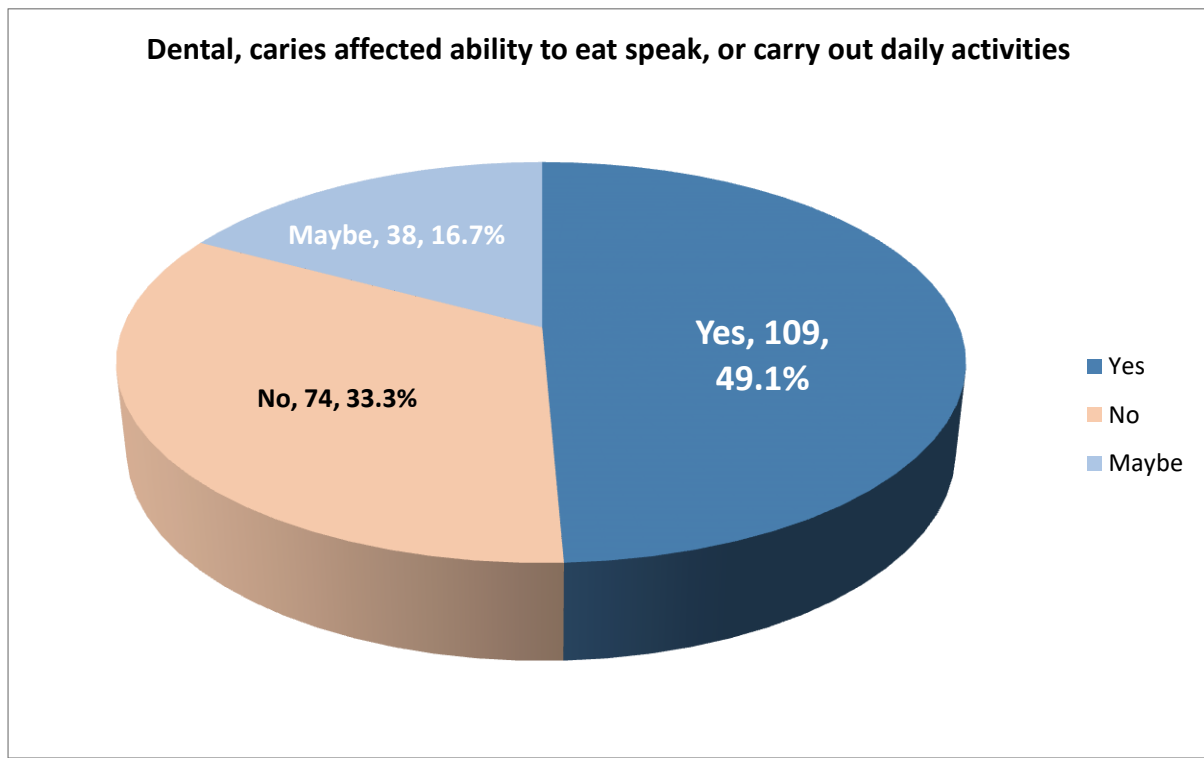


Figure5.19: Dental, caries affected ability to eat speak, or carry out daily activities

During dental problems, in most cases, about 109 people i.e. 49.1 percent people are suffering from various problems such as problems in speaking, problems in daily living. On the other hand 74 people i.e. 33.3 percent people did not face any problem. 38 people i.e. 16.7 percent people have faced problems occasionally.

5.20 They have any chronic health conditions (e.g., diabetes, autoimmune diseases)

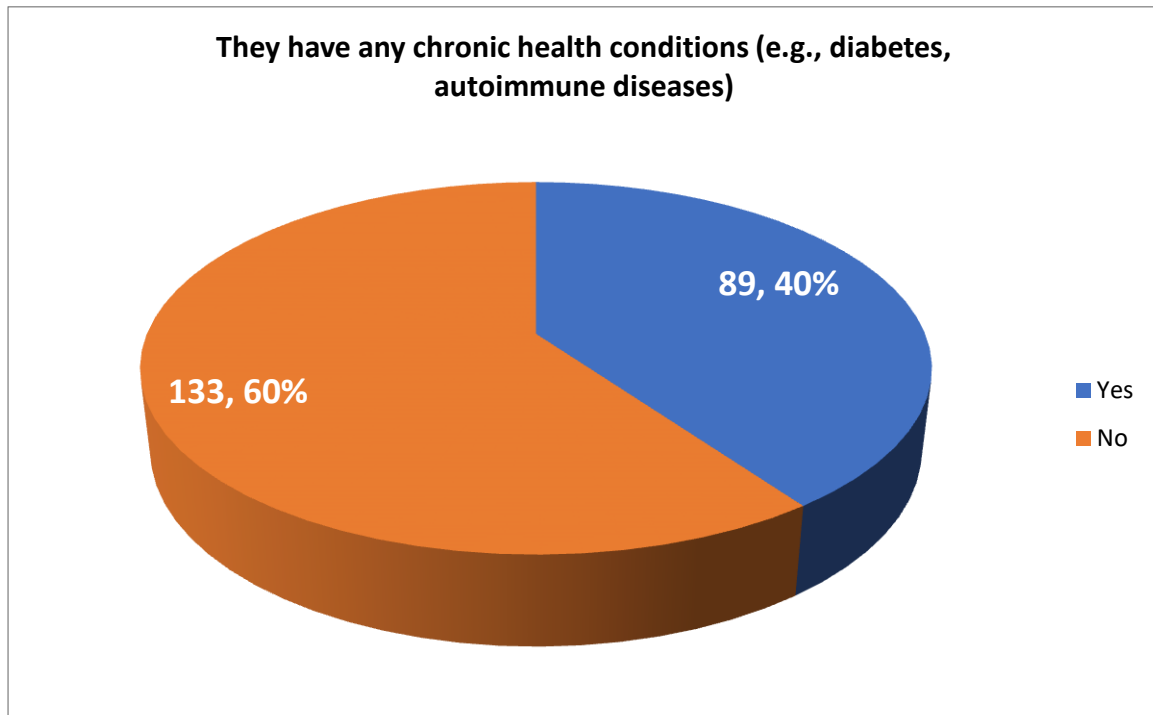


Figure5.20: Chronic health conditions

In most cases, other chronic diseases such as diabetes, auto immune diseases have no direct effect on their problems. 60% of people are not suffering from such diseases but still they are suffering from dental problems. Their number is 133 people. On the other hand 89 people are suffering from dental problems and such diseases at the same time which is 40%

5.21 Type of medicines they take for dental caries

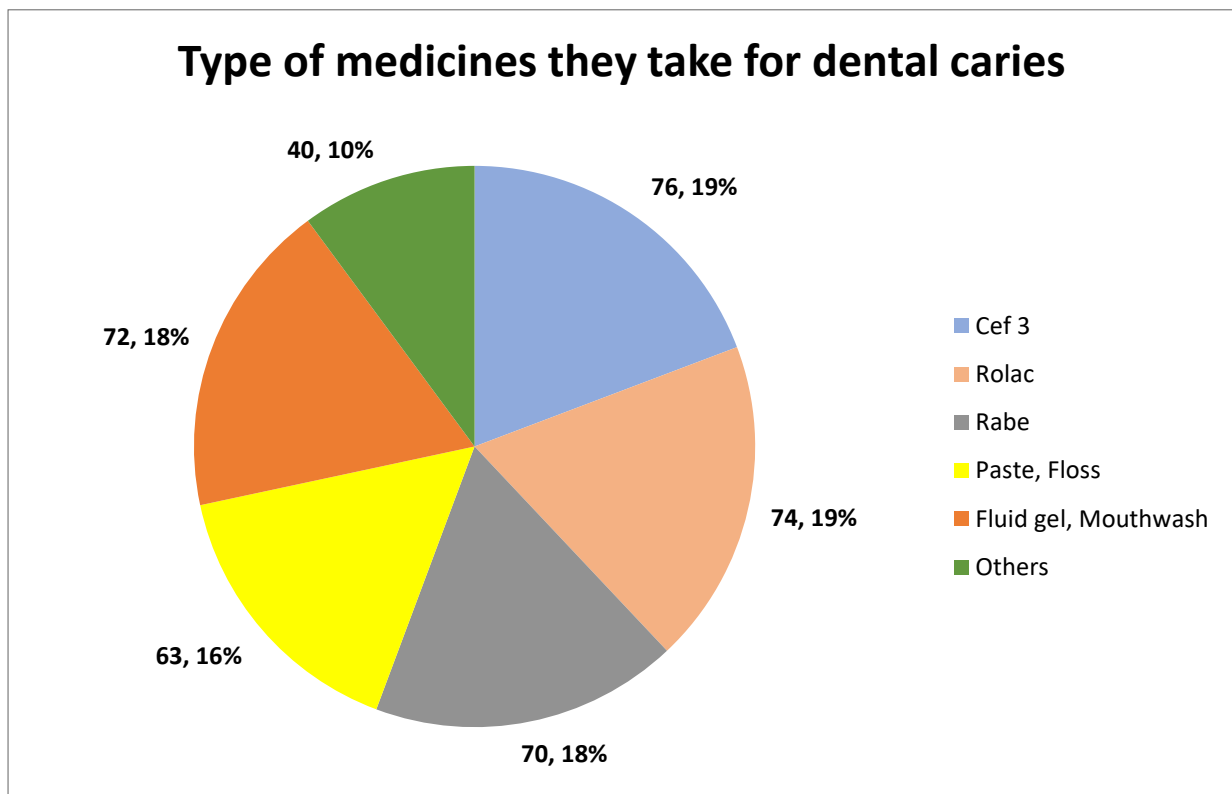


Figure5.21: Type of medicines they take for dental caries

Most patients are taking this type of medicine. Cef 3 (76, 19%). Rolac (74, 19%). Rabe (70, 18%)

5.22 Required any type of medical surgery

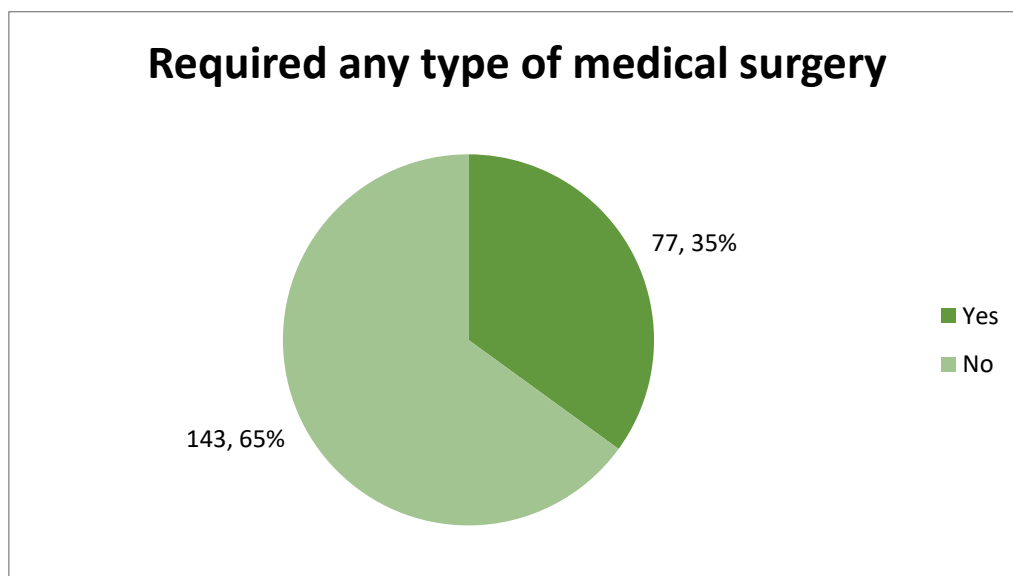


Figure5.22: Required any type of medical surgery

In most cases I have seen dental treatment does not require any type of surgery. 143 people i.e. 65% people recovered without any kind of operation. Only 35% of people needed surgery to recover.

5.23 Did it completely clear up after treatment or did it come back

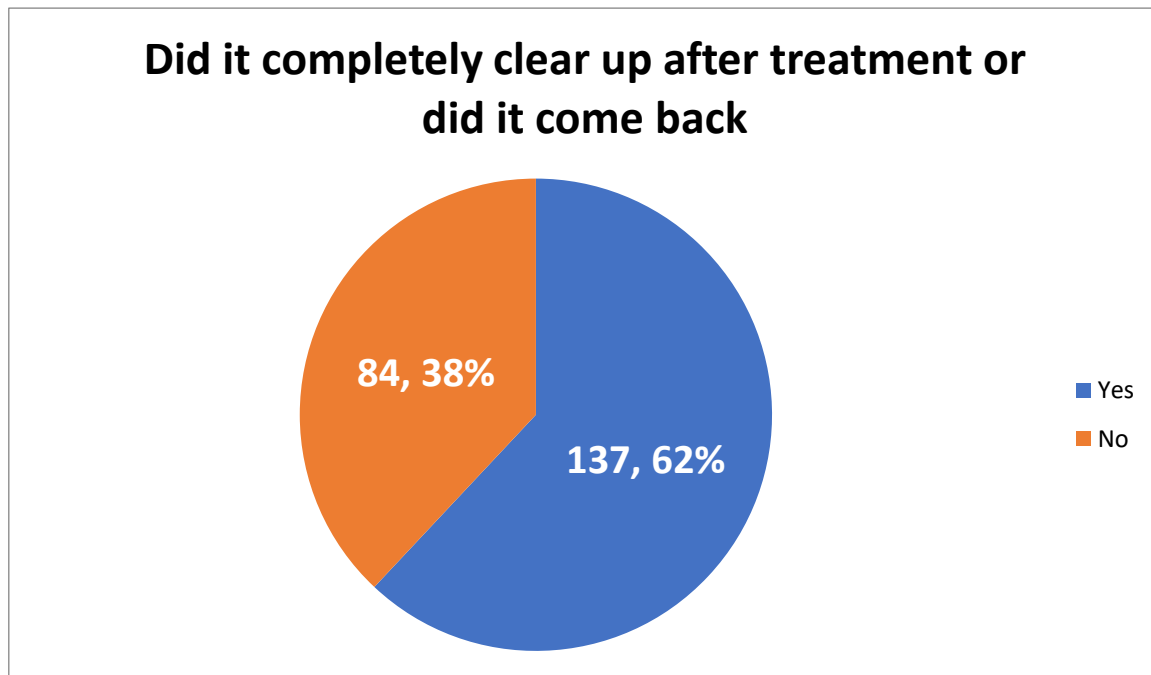


Figure5.23: clear up after treatment or did it come back

62% of people recovered completely after one dental treatment, requiring no further treatment. 38% of people had subsequent treatment or follow-up.

5.24 Undergone any medical treatments or surgeries that may have impacted oral health

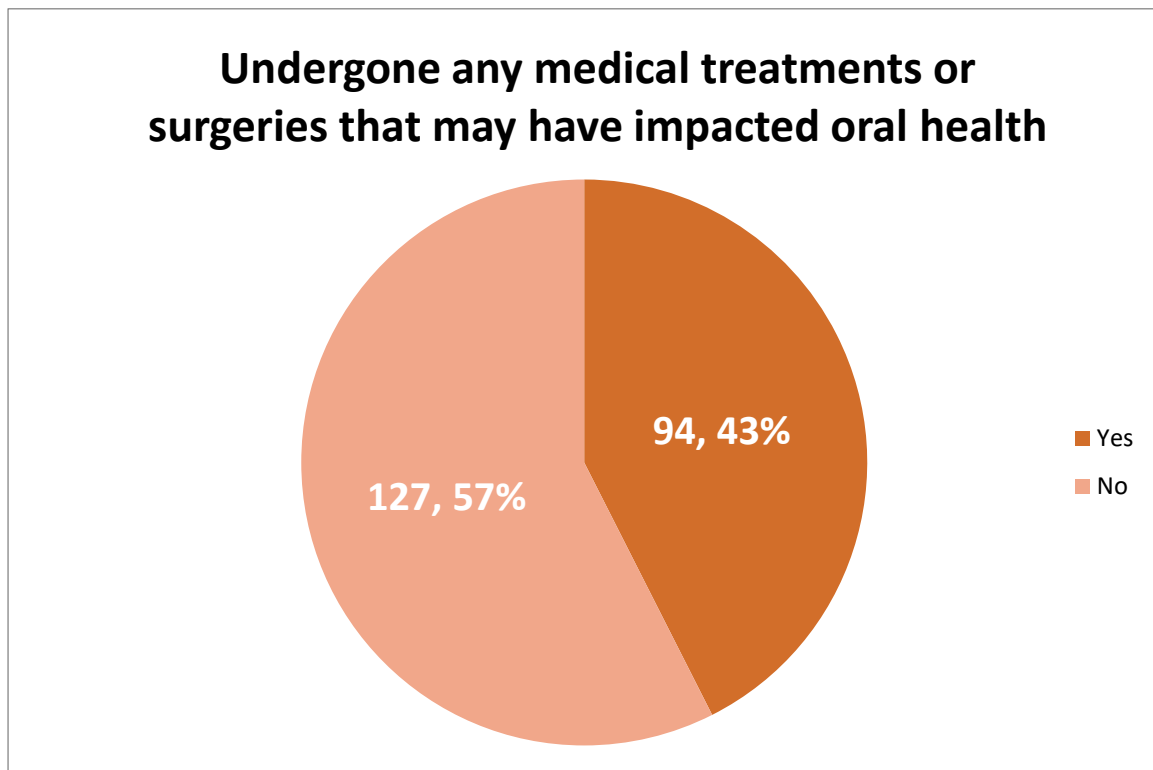


Figure5.24: Undergone any medical treatments or surgeries that may have impacted oral health

In most cases I have seen dental caries have not been encountered for any previous facial operations. 94 people i.e. 43% developed dental caries after oral surgery. But 127 people who had oral surgery did not experience any dental problems.

5.25 Follow any specific dietary practices that promote oral health (e.g., avoiding sugary foods, consuming dairy products)

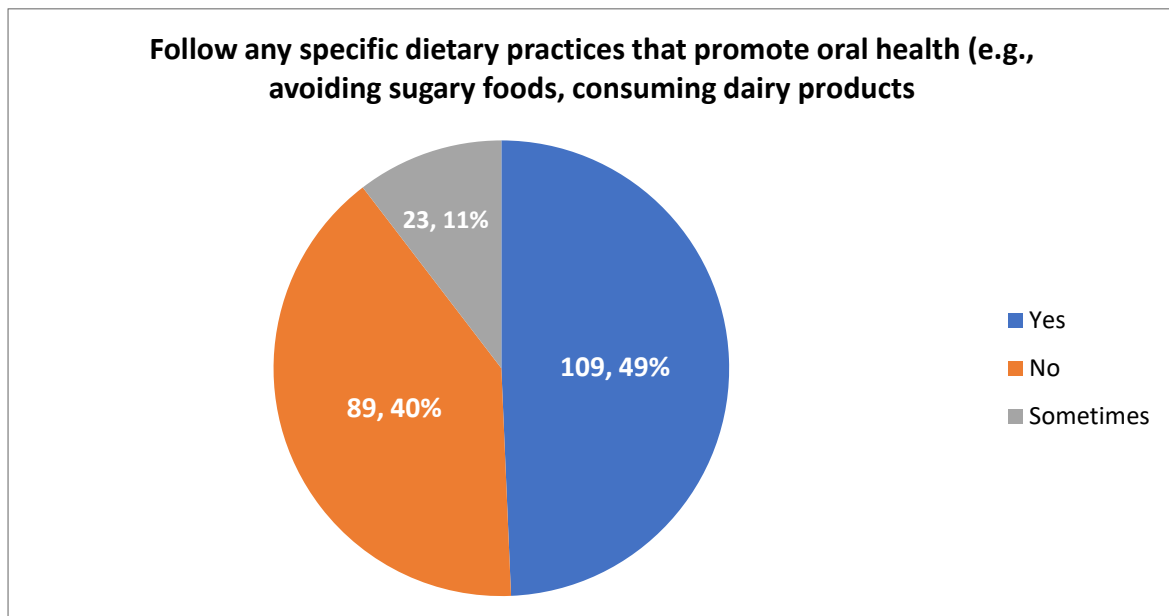
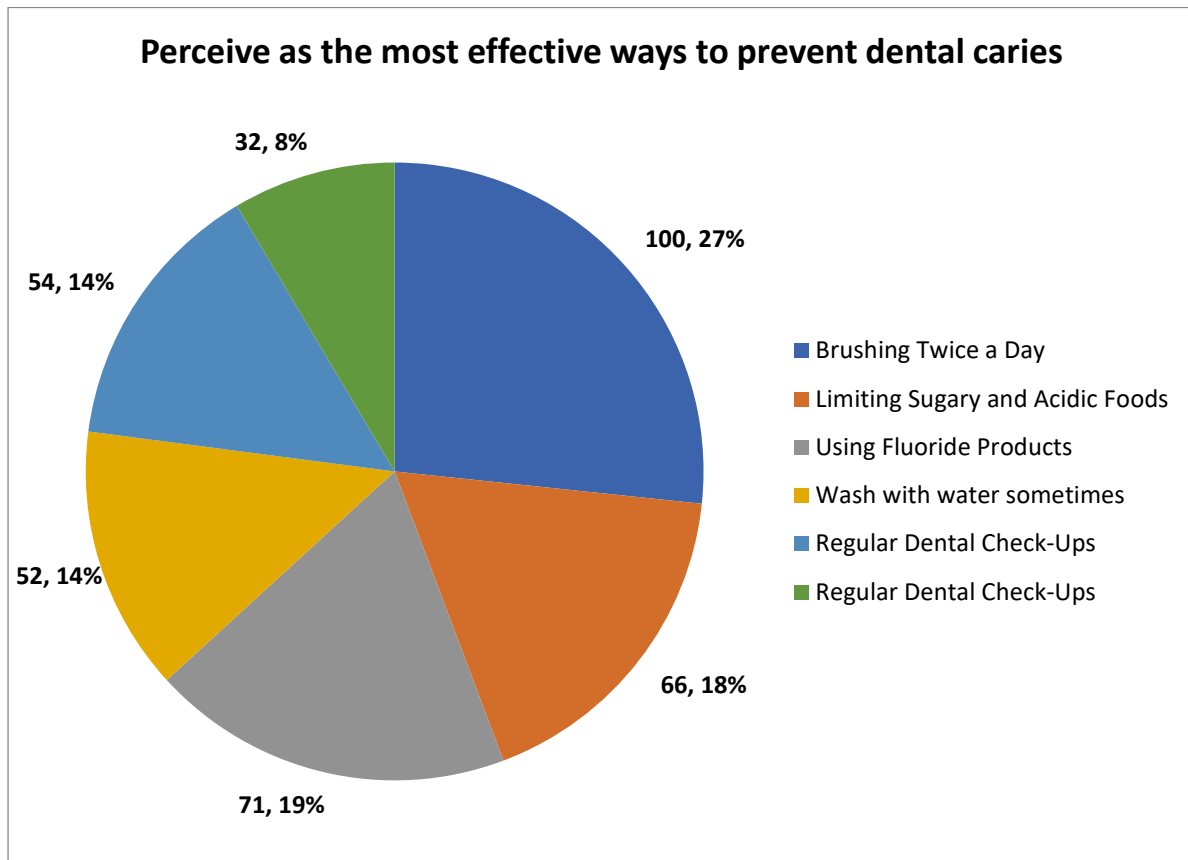


Figure5.25: Follow any specific dietary practices that promote oral health (e.g., avoiding sugary foods, consuming dairy products)

I have seen about 109 people i.e. 49% people are aware of their diet for dental health, they eat mixed food less, drink dairy food in moderation. The remaining 40% i.e. 89 people do not follow any kind of dietary habits. They eat normal food. But 11% of people, about 23, are occasionally food conscious when they suffer from their problems

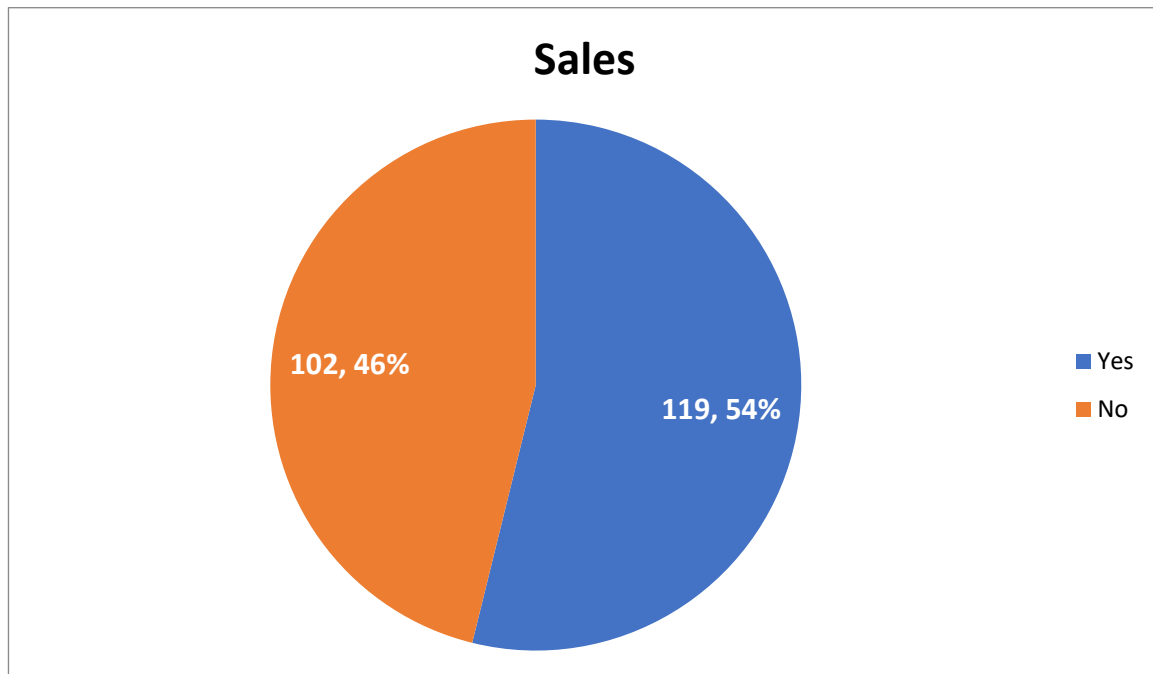
5.26 Perceive as the most effective ways to prevent dental caries



Figur5.26: Perceive as the most effective ways to prevent dental caries

After treatment, 100% of people feel that regular brushing twice a day solves many dental problems. About 66 people, i.e. 39 percent of the people, think that eating moderately sweet foods can reduce dental problems. 23% of people think that regular brushing with water can reduce dental problems in many areas. 18.4 percent of people think regular dental checkups will improve their health

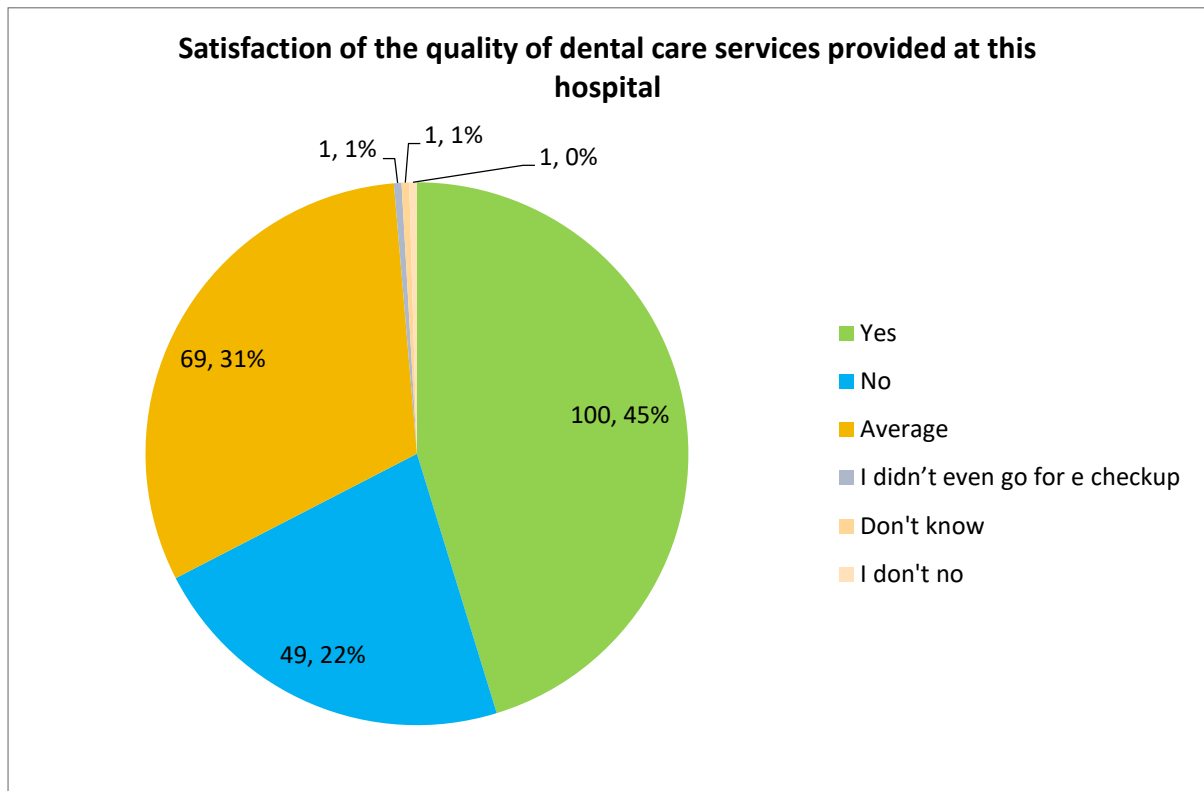
5.27 Face any barriers to accessing dental care services (e.g., cost, transportation, availability)



Figur5.27: Face any barriers to accessing dental care services

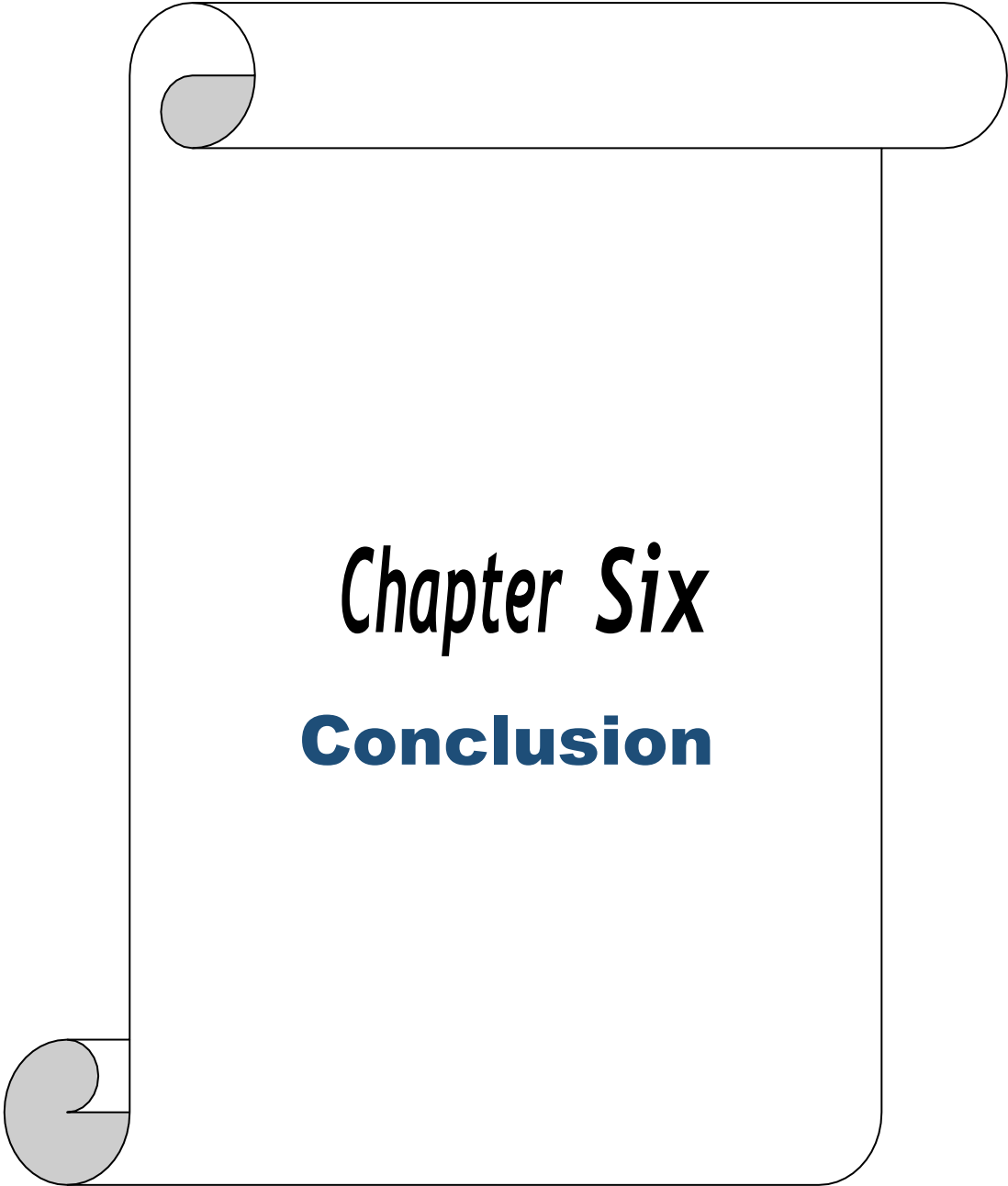
54 percent of people did not face any kind of obstacle in taking dental caries treatment. But some people faced obstacles in seeking treatment for about 46% of dental problems.

5.28 Satisfaction of the quality of dental care services provided at this hospital



Figur5.28: Satisfaction of the quality of dental care services provided at this hospital

45 percent people are satisfied and 22 percent people are not satisfied after taking dental caries treatment while 31.1 percent people have mixed comments. Many people think that dental treatment is a long-term procedure, quite expensive, and finding the right doctor is also a challenge.

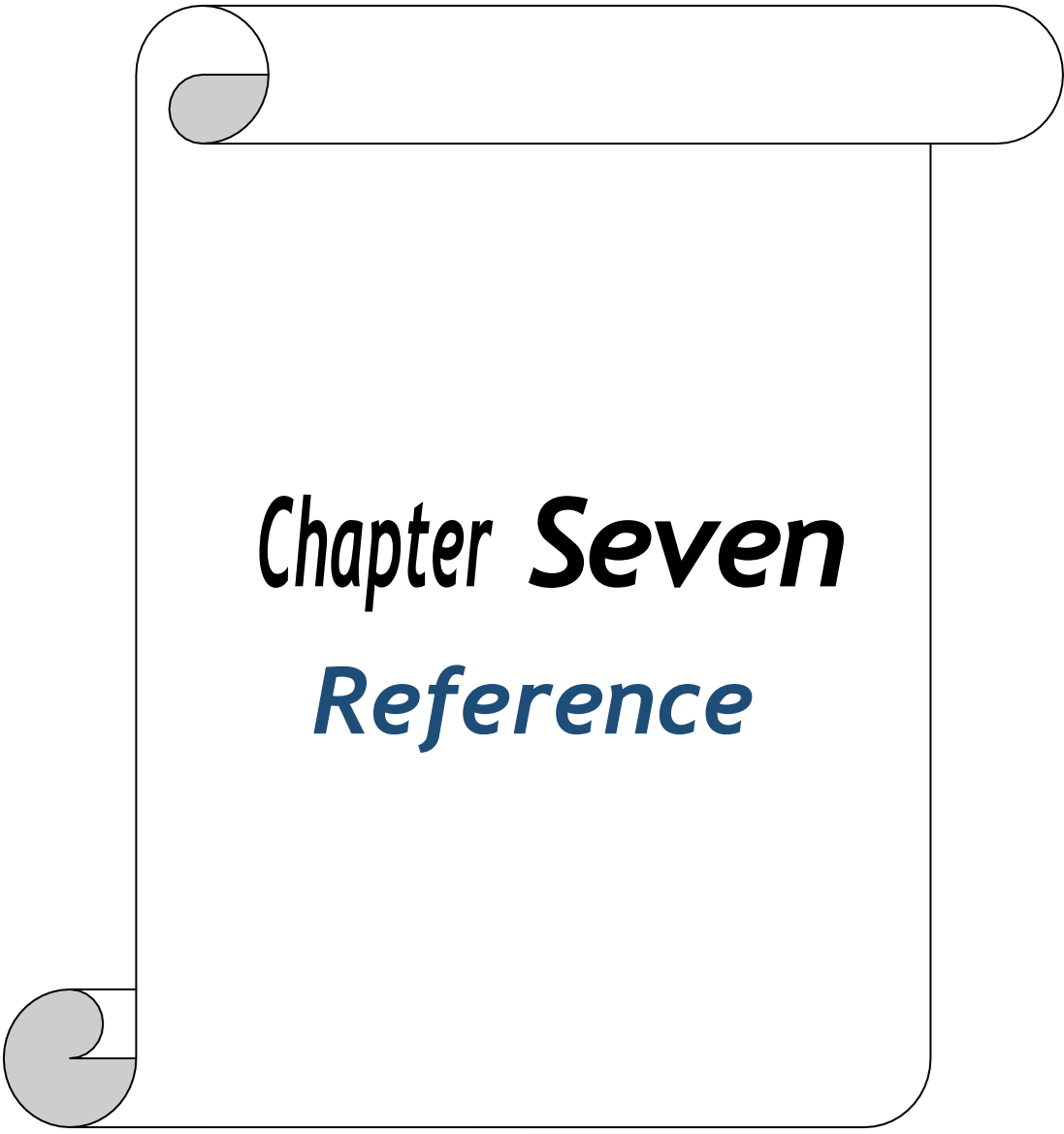


Chapter Six

Conclusion

6. Conclusion

The primary focus of this study is dental carriers from a clinical standpoint, which may be essential for Bangladesh's effective and safe medicine delivery system. More boys than girls were found to be impacted. This study included a thorough examination of the local pharmaceutical market and the frequency of dental carriers. The majority of patients with dental carriers are men between the ages of 20 and 30, according to this study. This study also revealed that, should oral hygiene education not be included in school curricula, intake of chocolate and fast food will likely increase the prevalence of caries in the near future. It is also advisable to counsel parents to make sure their children are properly brushed while being closely watched. Children's dental health is something that parents should be mindful of. Regular parent-teacher conferences should be held to inform parents about the value of proper hygiene habits in preventing illness. The daily activities of the school and community should include oral health education. Thus, it is important to highlight and applaud the growing number of "Dental Public Health Awareness Programs," such as those organized by the "Tooth Fairy Foundation."



Chapter Seven

Reference

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