

## Survey of Dental Caries, Gingivitis Prevalence, Dietary, and Oral Hygiene Habits among Patients Visiting Dental Clinic in Zawia, Libya

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### الملخص

الغرض من هذه الدراسة هو تحديد مدى انتشار تسوس الأسنان وأمراض اللثة وممارسات النظافة الغذائية والفم بين المرضى الذين يحضرون أربع عيادات أسنان في الزاوية ، ليبيا ، لتحديد مدى الحاجة إلى علاج الأسنان. تم التحقيق مع 150 شخصاً (52 رجلاً و 98 أنثى). لتحديد عادات المريض الغذائية وصحة الأسنان ، تم إجراء المقابلات باستخدام استبيان محدد مسبقاً. نظر المسح في معرفة طب الأسنان ، ومصادر المعرفة الخاصة بالأسنان ، وسلوك صحة الفم (على سبيل المثال ، التكرار اليومي لتنظيف الأسنان بالفرشاة ، واستخدام خيط تنظيف الأسنان ، وفحوصات الأسنان المنتظمة). 100 في المائة من الذكور والإناث الذين تم تقييمهم لديهم تسوس تم تشخيصه سريريًا. تم العثور على التهاب اللثة في 75 في المئة من الرجال و 66.3 في المئة من النساء الذين خضعوا للاختبار. تشير النتائج إلى أن الإناث أكثر عرضة من الذكور للإصابة بالتهاب اللثة. تم تطوير عادات نظافة الفم ، مثل تكرار تنظيف الأسنان بالفرشاة ، في 81 من أصل 98 أنثى و 44 من أصل 52 رجلاً. كانت الإناث 41 (كل يوم) أكثر عرضة من الرجال 18 لاستهلاك الحلويات / الحلوى والمشروبات الغازية (كل يوم). وفقاً للنتائج ، كان لدى جميع المرضى في العيادات الأربع انتشار كبير في تسوس الأسنان واحتياجات العلاج. نتيجة لذلك ، هناك طلب كبير على العناية بالأسنان والتدابير الوقائية. كانت عيادة الأسنان المصدر الأكثر انتشاراً لمعلومات الأسنان بين مرضى الزاوية. ليبيا وارتبطت بتحسين سلوك صحة الفم

### Abstract

*This study aims to estimate the predominance of tooth decay, periodontal disease, and dietary and oral hygiene practices among patients attending four dental clinics in Zawia, Libya, to determine the need for dental treatment. A total of 150 people were investigated (52 men and 98 females). To establish the patients' food and dental hygiene habits, interviews were done using a pre-determined questionnaire. The survey looked at dental knowledge, dental knowledge sources, and oral health behavior (e.g., daily frequency of tooth brushing, use of dental floss, and regular dental checkups). 100 percent of the males and females evaluated had caries that had been clinically diagnosed. Gingivitis was found in 75 percent of the men and 66.3 percent of the women who were tested. The findings imply that females are more likely than males to be free of gingivitis. Oral hygiene habits, such as teeth brushing frequency, were developed in 81 out of 98 females and 44 out of 52 men. 41 Females consume sweets/candy and soft drinks (every day) more than men. According to the findings, all of the patients in the four clinics had significant caries prevalence and treatment needs. As a result, there is a considerable demand for dental care and preventative measures. The dental clinic was the most prevalent source of dental information among the patients at Zawia. Libya and it was linked to better oral health behavior.*

**Keywords:** Dental caries, Dental knowledge, Gingivitis, Oral hygiene habits, Oral health behavior, A questionnaire survey, and Toothbrushes

## Introduction

Despite worldwide improvements in population oral health, problems persist in several communities across the world, particularly among uneducated people [1]. Overall health and several other oral disorders have been affected by poor oral health. Pain, difficulty eating, chewing, smiling, and communicating as a result of missing, discolored, or damaged teeth have a significant influence on people's everyday life and well-being. Oral illnesses often limit activities at school, work, and at home, resulting in the loss of millions of school and work hours each year throughout the world [2]. Visiting oral health care is not accessible in many underdeveloped nations, and these treatments are primarily offered in metropolitan areas at regional and central hospitals. Preventive and restorative dental care get very little attention [3]. Oral health personnel is in insufficient supply in many underdeveloped nations in Asia, Africa, and Latin America, and oral health treatment consists mostly of pain alleviation and emergency care.

To ease pain and discomfort in children and adults with dental decay, teeth are left untreated or removed. As a result, many poor nations are projected to see an increase in public health issues connected to tooth loss and reduced oral function [2]. Oral disorders have a significant impact on individuals and communities as a consequence of pain and suffering, impairment of function, and lower quality of life [4]. Dental caries and periodontal disorders have long been thought to be the most serious global oral health problems. Dental caries affect 60-90 percent of school-aged children and the great majority of adults in most developed countries. Until recently, the incidence of dental caries was low in most developing nations, but the rate of dental caries is currently steadily increasing. This is mostly due to rising sugar consumption and insufficient fluoride exposure [2].

Dental caries are distributed differently in different countries, as is the severity of the disease [1]. Decayed, missing, and filled teeth (DMFT) for 12-year-olds were predicted to be 1.74 in 2001 and 1.61 in 2004 globally [5]. Children have a greater rate of dental caries than adults. The measure is higher in the Americas (3.0) and Europe (2.6), but lower in Africa (1.6) and Southeast Asia (2.6). (1.7).DMFT index of 1.0 was in Bangladesh (2000), Myanmar (1993), and Nepal (2000) with 1.0 DMFT index [5].

The scientific word for tooth decay or cavities is dental caries. Bacteria of a certain sort cause it. They create acid, which eats away the tooth enamel and the dentin beneath it. The human mouth is generally home to a wide variety of germs. Plaque, a sticky film that forms on the teeth, collects them. Saliva, food particles, and other natural chemicals are also found in this plaque [11]. It develops most easily in specific locations [12]. Sugar and carbohydrates (starches) in our meals are converted to acids by bacteria. The acids dissolve minerals in the top of the tooth's hard enamel (the part you can see). Enamel wears away or creates pits. At first, they are too little to notice. They do, however, grow in size with time. The inflammatory condition that affects the mucosal epithelial tissue around the alveolar processes and the cervical region of the teeth is known as Gingivitis [13]. There are many ways to define Gingivitis based on its clinical appearance (e.g., ulcerative, hemorrhagic, necrotizing, purulent), etiology (e.g., drug-induced, hormonal, nutritional, infectious, plaque-induced), and duration (e.g., drug-induced, hormonal, nutritional, infectious, plaque-induced) (acute, chronic) [14].

A plaque-induced chronic variant is considered the most prevalent kind of gingivitis. It's a condition in which the gums (gingiva) around the teeth become inflamed. Gingivitis is known as the most common form of periodontal disease, affecting a large percentage of the population (diseases of the tissues surrounding the teeth). Periodontitis can develop as a result of chronic gingivitis, which can cause receding gums (This gingival irritation is graded according to its severity [13]. Gingivitis can range from moderate to severe, and necrotizing ulcerative gingivitis is a rare but devastating condition.

Inflammation is a complex system in which bacteria-fighting cells from the body are recruited to an infection site. Inflammation has a key role in the progression of gingivitis. This gums inflammation is what causes the bulk of the symptoms of gingivitis. Bacteria can cause gum inflammation [13]. Bacteria may be dangerous, even though they are plentiful in our bodies and often provide defensive advantages. Germs grow in the mouth because it is an ideal habitat for them. Bacteria need a warm, moist environment to thrive, as well as a constant source of food. Bacteria in the mouth would swiftly spread out of control if the immune system were not powerful enough to counteract the body's defense mechanisms.

Oral hygiene is vital for dental health since it involves brushing and flossing our teeth to prevent the formation of dental calculus, plaque, and gum disease [8]. Sustaining appropriate dental hygiene is crucial for general health and a higher quality of life for each individual [7]. Conversely, if we have poor dental hygiene, our quality of life will suffer. For example, we will experience pain and have difficulties interacting with others [20]. Practicing oral self-care is one of the strategies that may be utilized to maintain healthy individual oral hygiene. Dentists' health beliefs and attitudes will not only influence their oral hygiene practices, but they may also motivate their patients to keep their teeth clean [21]. A person's attitude and conduct can be influenced by a variety of variables [18]. Knowledge is one of the variables that influences someone's attitude and conduct [16]. Knowledge may be defined as an individual's level of comprehension of facts, information, skills, and other topics [19]. As a result, understanding oral health is critical during the training period, especially for future dentists. Apart from that, people's health behavior is influenced by their social class and educational degree [20].

Oral hygiene methods include teeth brushing, flossing, mouth rinses, and a professional cleaning to remove bacterial plaque from the tooth surfaces mechanically or chemically. Tooth brushing and other mechanical methods are seen to be the most effective ways to manage plaque, as long as the cleaning is adequate[9].complete, and done daily. It is recommended that children wash their teeth as soon as they emerge. At this age, a piece of gauze or cotton wool can be utilized. Up to the age of 5-6 years, when they are anticipated to develop the dexterity to remove plaque properly on their own, youngsters should be supported with tooth cleaning [20]. Flossing is also recommended to keep the spaces between the teeth clean. . The effectiveness of different dentifrices in eliminating plaque and imparting topical fluoride varies [10]. Antiseptic mouth rinses aid in the reduction of oral microflora. Maintaining oral health requires professional mechanical teeth cleaning at intervals customized to each individual's needs [19].

Dental care is given a low priority as a health necessity in society due to ignorance and a careless attitude toward teeth. One adult participant in a research done in a countryside community

in South Africa stated, "Most of the time, we don't bother about our teeth as long as we fill our stomach." This may be a good summary of the attitude toward oral health in poor nations. Participants in the same survey placed dental services last, below infant clinics, vaccination clinics, and minor injury clinics [17]. Individuals in a tight economy are also less concerned about their oral health. Intervention is only required in cases of severe pain or discomfort, such as swelling [5].

### Justification

The link between oral hygiene practices, dental care, and gum disorders is poorly understood. The goal of this study is to assess patients' understanding of this link and how they apply it to their dental hygiene habits. The findings of this study may be utilized to develop strategies to educate the public on the causes of dental caries and gum disease, as well as how to avoid them. This will lead to improved dental hygiene and, as a result, a decrease in the occurrence of periodontal diseases.

### Objective

1. To find out how often dental caries and gum disease are among patients who frequent four dental clinics in Zawia.
2. To investigate the link between dental caries and gum disease and oral hygiene behaviors.
3. Assessing the oral hygiene habits of patients

### Materials and methods

**Study design:** A questionnaire survey was used to conduct the research.  
**Sampling:** 150 males and females were included in the study which is a convenient sampling method.

This study was conducted In Zawia city, Libya. 150 patients from four separate dental clinics were given a survey questionnaire with multiple-choice questions. All of the patients from those four clinics filled out the identical questionnaire. Within three months, the replies from the patient population were gathered. The result is presented in bar charts and expressed in percentages for the categorical variable 150 males and females aged from 7 to up 61 (figures 1 & 2) were recruited and interviewed about their oral hygiene practices and the prevalence of dental caries and gum diseases. Data were collected utilizing an interviewer-administered questionnaire. The questionnaire was administered and filled by the interviewer according to the patients' responses. Data collected was analyzed with the aid of a computer and presented in proportions and percentages of the entire sample

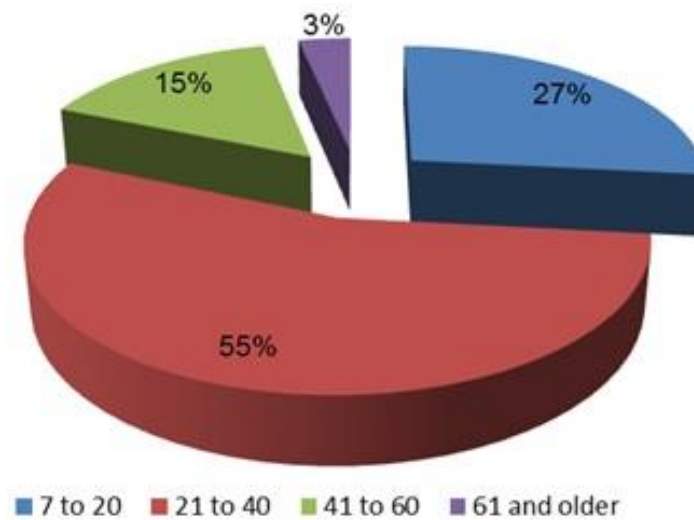


Figure 1: Distribution of patients examined according to age in four dental clinics at Zawia, Libya.

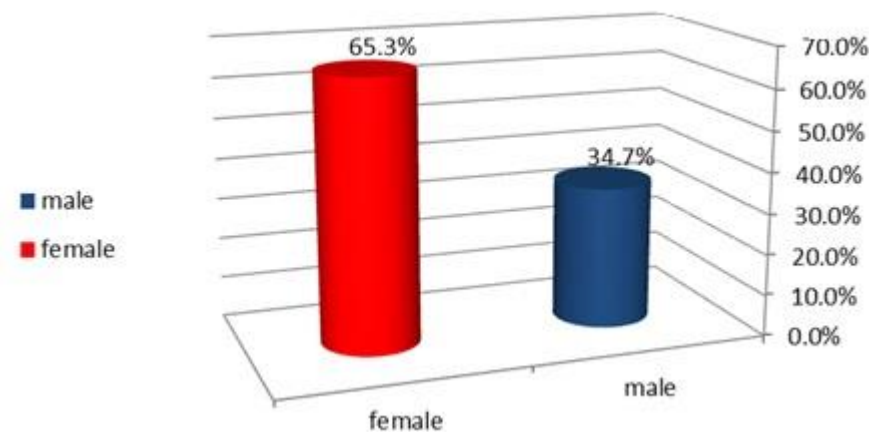


Figure 2: Distribution of patients examined according to gender in four dental clinics at Zawia- Libya

## Results

The findings of this study are given in a bar chart based on data obtained from 150 male and female patients from four separate clinics in Zawia, Libya. To maintain confidentiality we divided the samples into four groups, males, female respectively.

Table 1: Questionnaire analysis

Question	Male n = 52 (34.7%)	Female n = 98 (65.3%)
1. What do you use to clean your teeth?		
a. Toothbrush and toothpaste	44	81
b. Toothbrush, toothpaste, and floss	5	6
c. Floss only	1	6
d. Miswak only	2	5
2. How many times do you brush your teeth?		
a. Once a day	49	66
b. Twice a day	3	30
c. More than twice a day	0	2
3. How often do you change your toothbrush?		
a. Once a month	0	5
b. Once in three months	30	52
c. Once in 6 months	22	42
4. How often do you go to a dental clinic for checking your teeth?		
a. Once a year	48	90
b. Twice a year	4	7
c. More than two times a year	0	1
5. How often do you get your teeth clean by a dentist?		
a. Never	14	20
b. Once a year	25	40
c. Twice a year	13	38
6. How often do you eat sweets?		
a. Never	4	4
b. Once a week	10	9
c. Twice a week	10	19

d. Every day	18	41
e. Sometimes	10	25
7. What is the technique you used while brushing your teeth?		
a. Vertical motion	14	24
b. Vertical and horizontal motion	25	27
c. Vertical, horizontal and round motion	7	29
d. Randomly	6	18
8. How long do you take to brush your teeth?		
a. About half a minute	14	24
b. About one minute	25	27
c. About two minutes	7	29
d. More than 5 minutes	6	18
9. How do you control your mouth odor?		
a. Regular rinse with plain water	21	20
e. Rinsing with salty water	19	38
b. Using mouthwashes	12	40
10. What kind of problem do you have in your mouth?		
a. Tooth pain	15	20
b. Change in gum color	15	41
c. Gum bleeding	9	14
d. Gum swelling	12	19
e. Other	1	4
11. What kind of infection do you have in your mouth?		
a. Dental caries	52	98
b. Gingivitis	30	65

The majority of male and female patients in this research use a toothbrush and toothpaste, while others use a toothbrush, toothpaste, and dental floss, and some choose to use only dental floss. We can observe from (Table 1) that ladies from various clinics had the greatest proportion (81 percent). Patients from all four dental clinics said they cleaned their teeth once a day on

average, while the others said they brushed twice a day regularly. According to (Table 1), ladies from various dental clinics had the largest proportion (40 percent) for choice B, which is to clean their teeth once a month. Females had the second largest proportion for this question, with roughly (38 percent) choosing option c.

Females (41%) were more likely than men (18%) to consume sweets/candy and soft drinks daily (every day). (Table 1) In general, patients choose vertical and horizontal motion for brushing their teeth above the other two options, which are vertical motion and vertical, horizontal, and round motion methods. Brushing time varies across responders, according to my research, and not everyone brushes at the same time. Some people wash their teeth for half a minute, one minute, or two minutes, while others clean their teeth for more than five minutes. The majority of males and females like to brush their teeth for roughly one minute, while the least number, less than 20% for each dental clinic, and prefer to clean their teeth for more than five minutes. According to a survey question distributed to 150 dental patients, the majority of females chose to regulate their mouth odor by using mouthwashes and rinsing with saltwater. The males, on the other hand, liked to rinse with plain water and salt water frequently.

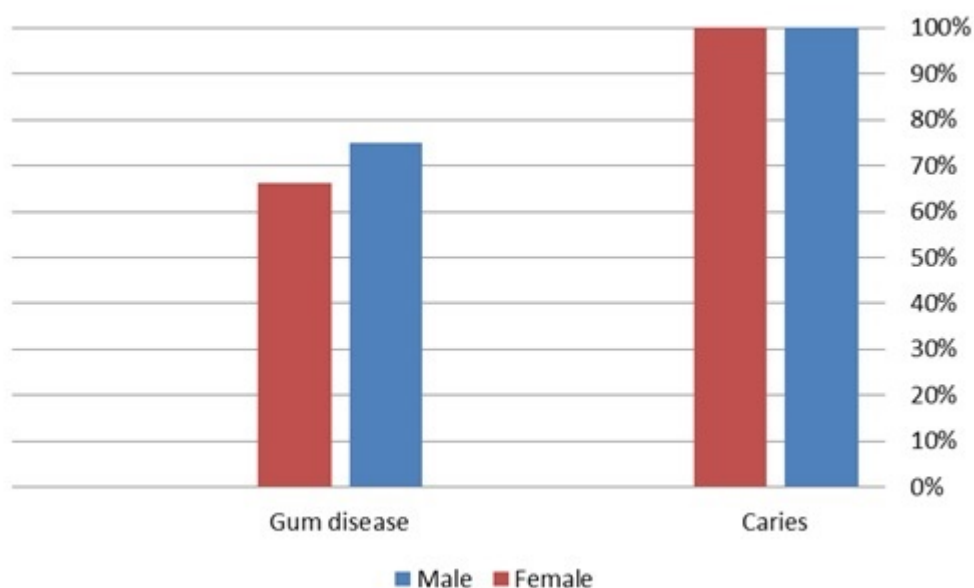


Figure 3: proportion of dental caries and gum disease by gender

In this survey, 100 percent of the males and females evaluated had caries that had been clinically diagnosed. Gingivitis was found in 75 percent of the men and 66.3 percent of the women who were tested.



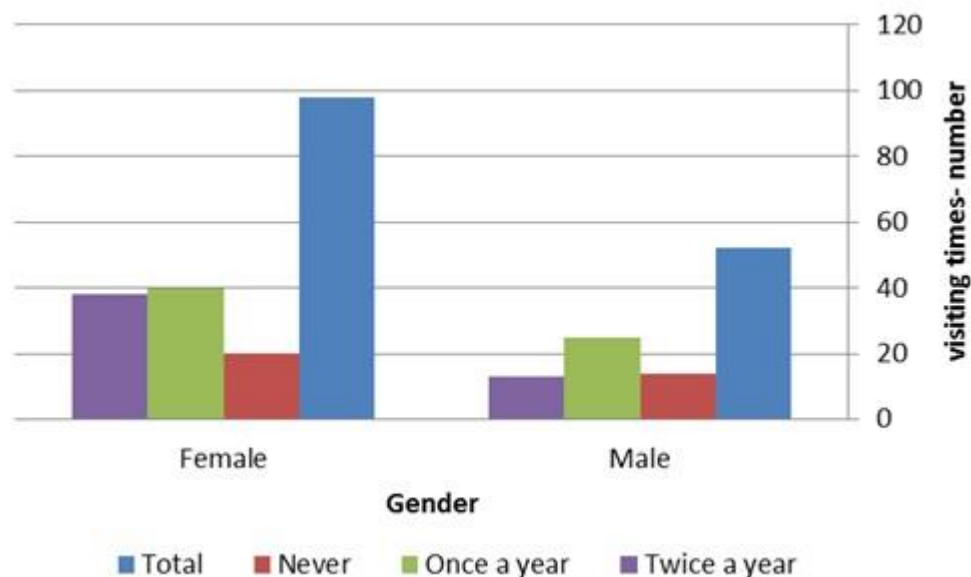


Figure 4: How often do you visit a dentist?

Based on the bar chart, the frequency of dental patients going to the dental clinic for checking their teeth is highest for females which is once a year.

### Discussion

To attain oral health advantages, toothbrushes and other oral hygiene aids should be used correctly regularly. Dental plaque is often seen on the surface of teeth and dental equipment. Plaque formation takes many hours and should be eliminated at least every 48 hours to keep our teeth free of caries and infection. Based on the influence of education on oral hygiene habits, significant disparities in the degree of oral cleanliness can be identified among dental patients from various clinics [6]. According to this study, the majority of patients rely only on the usage of a toothbrush and toothpaste to maintain their dental hygiene and these results were similar to those of earlier studies in India [6], Bangladesh [19], and Nigeria [20], but not to those obtained in Kenya [18], where only a tiny percentage of patients reported using toothpaste. Floss is only utilized by a small percentage of patients to keep their teeth clean. Because periodontal lesions are usually found in the interdental space, brushing teeth with a toothbrush and toothpaste alone, without flossing or any other interdental cleaning, is insufficient to prevent gingival disease and periodontal disease [7]. Less than a third of the participants in the current research cleaned their teeth twice a day, which was comparable to what was found in Kenya [18] but different from what was found in Qatar [17]. The responders' brushing times varied from one another. Some claim to have brushed their teeth for roughly half a minute, while others claim to have brushed for one minute or even two minutes. Only a handful of them chooses option D, which involves cleaning teeth for more than five minutes. The majority of dental patients are still unaware of the value of dental visits and the role of the dentist in preserving their oral health. Approximately half of the respondents had a negative attitude toward having their teeth checked and cleaned by a dentist. [9]. Dental caries were found to be 100% prevalent among patients. Studies from the Islamic Republic of Iran, and the United Arab Emirates contributed to this.

The occurrence of dental caries has been linked to poor oral hygiene habits among patients, the intake of a cariogenic diet, and low socioeconomic position. Females were more likely than males to have gingival bleeding when cleaning their teeth, which indicates the presence of gingival disease. The amount of gingival bleeding during tooth brushing in the current research was somewhat greater than that reported in Qatar [17]. To conclude, the majority of dental patients from all four clinics said they washed their teeth once a day using toothpaste and toothbrushes but did not floss. Following that, the vast majority of dental patients responded that they visit the dental clinic at least once a year, either for teeth cleaning or to have their teeth checked. About half of the respondents said that washing their mouth with simple water helped them regulate their mouth odor.

### Conclusion

The significant element of the practice of dentistry is the control of plaque. Every person should be aware of this element and they should have at least basic knowledge on how to prevent plaque or otherwise, their teeth will be easily got the plaque. Good plaque control will help the individual to have good health in the oral cavity. Therefore, it can prevent getting any related oral cavity diseases like periodontal and gingival disease and tooth decay.

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