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Exploring Connections Between Diet, Saliva Production, and Oral Health

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ABSTRACT

The purpose of this research was to explore the relationship between diet, saliva production and oral health. It has been proven that there is a significant relationship between saliva concentration and tooth decay. People who consume large amounts of sugar experience a decrease in saliva secretion, as well as thick and sticky saliva. People who have thick and sticky saliva always have poor oral hygiene and their teeth are covered with pigment (stain) or plaque. The amount of tooth decay in these people varies from moderate to severe. One of the factors that reduce saliva is an improper diet, especially a lack of vitamins, excessive consumption of sugar, all kinds of chocolate, biscuits and sweets, and insufficient daily water consumption. Usually, the body needs 2 liters of drinking water (equivalent to 8 glasses). If the decrease in saliva is low or moderate, the tissues of the mouth and teeth may have a normal appearance, but a severe decrease in the flow of saliva or a complete stoppage of the flow of saliva causes an infectious mouth and severe decay of the teeth. Dryness and cracking of the lips, ulceration of the corners of the mouth, burning of the tongue and mucosa inside the mouth, impregnation of the tongue and palate are other complications of decreased salivation.

1. Introduction

The mouth and teeth are one of the most important parts of the human body, the observance of its health and hygiene habits is directly related to the health of other parts of the body, as well as the health of the soul and psyche of a person (Manqabati, 1403: 10). Dental health is directly related to diet. In fact, diet and nutrition have a great impact on the health of dental tissues. Be careful that sugar consumption increases the risk of tooth decay. That is, foods rich in starch and sugar cause an increase in acids, which are the main cause of tooth decay and loss of enamel or the outer layer of the tooth. Improper nutrition has a great impact on the development and increase of oral and dental diseases such as periodontal, caries, etc. People, especially children and teenagers, need a balanced and nutritious diet. In this way, their teeth become resistant to decay. People who are allergic or restricted to certain foods are at risk of protein and vitamin deficiency and even tooth decay and gum disease. Foods rich in calcium such as soy and tofu drinks, yogurt, cheese, milk, almonds, canned fish, and dark leafy vegetables strengthen teeth and bones. Phosphorus in lean meat, eggs, fish, dairy products, beans, and nuts is necessary for healthy teeth (Porakbarian-Niyaz and Santi-Pour, 1403: 5).

Oral and dental hygiene has played a very colorful role on the quality of human life. There are many tools to measure oral and dental health, dental education and the role of dentists are not separate from this category. Examining the oral and dental health of the community and the role of the influencers of matters related to (that goal) is also possible by comparing it with the health indicators defined and accepted by the health centers of the world. If it is consistent with those indicators, it can be considered as the reason for the success of the educational goals, and otherwise, one should look for the problems that arise on the way to achieve it (Vahdati and Rahimi, 1403: 9).

Tooth decay occurs as a result of the sugar in the mouth being converted into acid by the bacteria in dental plaque, and this acid dissolves the enamel minerals below it. At the beginning of decay, it is created under the surface of the tooth enamel and the surface of the enamel loses some of its minerals and is seen as a white spot, which is the stage before the development of decay. This white spot is actually a danger sign and if it is noticed, there is a possibility of enamel remineralization. Factors that are effective in remineralizing enamel are changing food, using fluoride, and controlling dental plaque. Food quality is effective in oral and dental health. Foods that require more chewing cause increased salivation. They reduce caries, while soft foods have less of this property and thus have more caries. Although food items such as sugars are very effective in causing caries, but by adding some food items to caries-causing materials, their damage can be prevented to a large extent. For example, if all kinds of vegetables, oil seeds, or milk and fat are used together with sugary substances, the decay-causing property of sugars is reduced. Therefore, the aim of this research was to explore the relationship between diet, saliva production and oral health.

1.Research background

Qaysari (1403) in an article titled Minister of Health and the need to pay special attention to the oral and dental health of the Iranian people stated that the Constitution of the Islamic Republic of Iran emphasizes the importance of equal access to basic health care, including oral health care and services. The tooth is emphasized. Despite progress in other areas of health care, the oral and dental health care system has faced challenges to meet the needs of the Iranian population. These problems occur due to the imbalance of technical and managerial information between the officials of the Ministry of Health, who are mostly doctors, and the managers of the dental field. Providing incorrect information to officials leads to decisions without scientific support. Inefficient allocation of resources and monopolization of treatments in the dental profession has caused a lack of equitable access to primary oral health services. To improve the situation, measures such as creating a transparent governance structure, formulating a plan to integrate oral and dental health into the primary care system, increasing health and treatment forces in villages and improving the level of welfare in deprived areas are recommended.

Maleki (2018) in an article entitled "Review of the important components of honey and its role in oral and dental health" stated that honey is nectar and secreted substance containing sugar of plants and flowers, which is produced by honey bees. The purpose of this review is to describe the sugars, proteins, amino acids, enzymes, organic acids, vitamins, minerals, phenolic and volatile compounds in honey and the protective effect of this substance in oral care. This study examines the efficiency of honey against streptococci mutans infection, dental plaque and caries, gingivitis, bad breath, and oral cancer. Honey was useful in preventing the effects related to the treatment of head and neck cancers, such as mucositis caused by chemotherapy, dry mouth and wound

healing.
Achida and Evitt (2023) in an article titled New Effects of Saliva on Oral Health stated that maintaining the balance of oral homeostasis depends on saliva. Saliva is a rich source of biologically available and molecularly rich fluid that performs many functions in the oral cavity, including lubrication, pH buffering, and tooth mineralization. The composition and flow of saliva can be adjusted by various factors such as circadian rhythm, diet, age, drugs and disease. A working knowledge of salivary function and physiology is essential for dental health professionals.
Gandiokar et al. (2019) stated in an article titled Nutrition and Oral Health that the human body needs daily nutrition in the form of carbohydrates, proteins and minerals to maintain health. The relationship between oral health conditions, dietary habits and nutritional status and general health status is complex with many related factors. Inadequate nutrition can affect oral and dental health, including tooth decay, periodontal diseases, oral mucosal diseases, and infectious diseases. Compromised oral health can alter food choices and negatively affect food intake, leading to poor nutritional status that can lead to chronic systemic diseases. Recognizing and treating oral health and nutrition problems is important in improving health and quality of life.

2.Research method

Descriptive-analytical research method and library information collection method. Therefore, the materials that were closer to exploring the relationship between diet, saliva production and oral and dental health were selected and further analysed.

3.Research findings

The findings of the research showed that diet has an effect on oral and dental health, which are mentioned below.

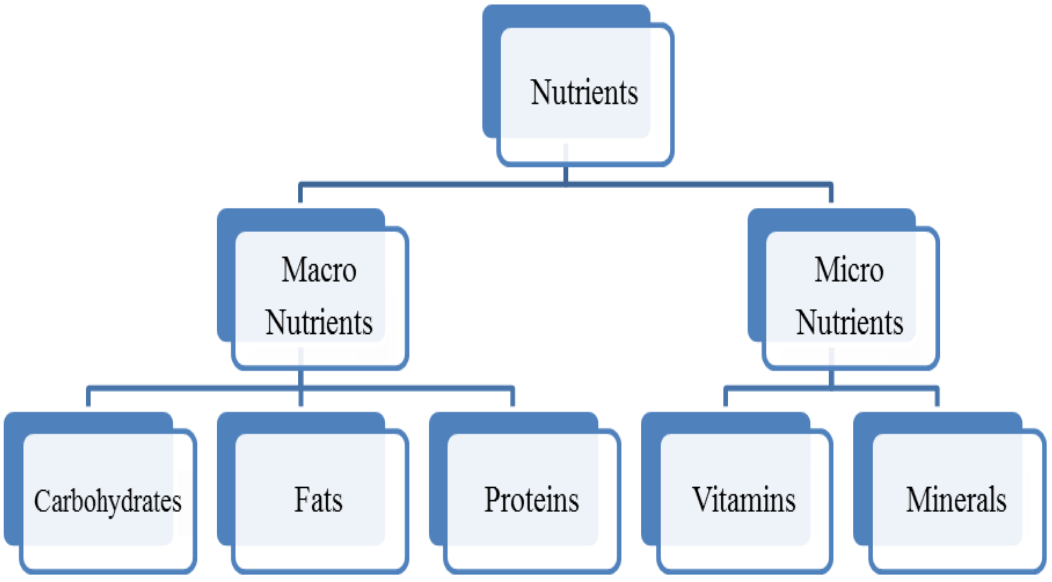

Chart 1: Classification of nutrients

-The importance of nutrition on dental health

Your body is a complex machine. The foods you choose and the amount you consume can affect your overall health as well as the health of your teeth and gums. For example, if you consume too many carbonated and sugary drinks or sugary drinks and non-nutritious snacks, you will definitely be exposed to tooth decay. Tooth decay is the most common chronic disease in childhood and occurs when plaque in the mouth comes into contact with sugar and the formed acid attacks the teeth, but the good news is that this problem is completely treatable. It is prevention. Foods containing any type of sugar can contribute to tooth decay. Therefore, to control the amount of sugar consumed, read the nutritional information and ingredients labels on food and drinks and choose the options that have the lowest amount of sugar. A dentist or nutritionist can also provide suggestions

for following a balanced diet and protecting teeth from decay and finally the effect of nutrition on teeth. Keep in mind that if your diet lacks certain nutrients, it is more difficult to resist the infection of the oral tissues. At the same time, this issue also helps with gum disease. The main cause of tooth loss in adulthood is due to severe gum disease, and many experts believe that this disease progresses faster and is potentially more severe in people with poor nutrition. This is why the role of nutrition on teeth is very important (Pedersen et al., 2018: 742).

-The effect of nutrition on tooth decay

There is no doubt that what we eat is related to tooth decay. The bacteria that live on our teeth, which we know as plaque, use the sugars in our diet as energy to produce more bacteria. Bacteria metabolize sugars, and this leads to the formation of acid, and finally the decay process begins with the softening of tooth enamel or dentin. Mainly three bacteria are involved in tooth decay:

- Streptococcus mutans bacteria
- Lactobacillus bacteria
- Streptococcus sobrinus bacteria

Since the acid enters the mouth and eventually the teeth (from bacteria that release acid or from acidic foods and drinks), it causes a drop in pH and eventually damages the tooth enamel. If the pH remains low for a long time, more damage will be done to the tooth and tooth decay will occur. Additionally, remember that saliva can help repair this decay and wash away sugars. Saliva consists of antibacterial components and can fight acid attacks with buffer compounds. The drier the mouth, the more tooth decay (Manoz-Gonzales et al., 2018: 725).

Figure 1. Tooth decay

-Nutrition and tooth erosion

Tooth erosion means the gradual loss of tooth enamel and dentine, which are chemically separated from the surface of the tooth. Low saliva flow and weak buffering capacity to deal with acidic challenges occur in people with dry mouth, and therefore tooth erosion can be an important issue. Acids can be intrinsic (from inside the body) or exogenous (from external sources). Intrinsic acids are produced by vomiting and regurgitation of blood, but exogenous acids are obtained from the diet, for example, citric acid, phosphoric acid, ascorbic acid, malic acid, tartaric acid and carbonic acids found in fruits. and fruit juices, soft drinks, some herbal teas or foods containing vinegar are found (Si et al., 2019: 289).

Figure 2. Tooth erosion

- Fluoride and caries

Fluoride is usually part of a person's natural diet. Drinking water in many areas contains fluoride, as well as most seafood, black tea, etc. Fluoride affects teeth in three ways:

1. Fluoride can become part of the tooth structure and create fluorapatite, a condition that is important against acid attacks.
2. Fluoride can repair the early stages of caries.
3. Fluoride can also affect the amount of acid released by bacteria in dental plaque and thus reduce the possibility of caries.

Considering the effect of nutrition on teeth, fluoride is considered the most effective factor in preventing tooth decay. The widespread use of this element in the last 30 years has greatly reduced tooth decay. However, no matter how widely fluoride is used, consumption of sugary substances still plays a significant role in tooth decay and can damage oral health (Qadri et al., 1403: 775).

Figure 3. Tooth enamel hypoplasia

Figure 5. Oral candidiasis

4.Conclusion

The purpose of this research was to explore the relationship between diet, saliva production and oral health. The findings showed that the effect of nutrition on teeth through a balanced diet is of great importance. In addition to the body, a diet rich in carbohydrates can also be harmful to your teeth, and those who often eat chips or snacks containing high carbohydrates and fat have more decay. Remember, balanced diets contribute to both dental health and general health.

The connection between diet and dental health is completely scientific. Just like other parts of the body, teeth and gums need different nutrients to keep them resistant to problems such as caries, gum diseases and tooth enamel erosion. This is why dentists recommend that children start healthy eating habits from an early age to prevent oral problems that may occur throughout life.

Therefore, good nutrition and healthy eating habits have a direct impact on the health of your teeth and therefore your overall health. Dentists always recommend a balanced diet full of all the necessary nutrients that will not only enable you to have healthy teeth and gums, but also to stay healthy. Your dentist does more than examine your teeth, as they are also your ally in learning about the vital connection between good nutrition and your dental health. A good combination of good nutrition and proper dental care is the key to allowing people to have a confident and healthy smile that will serve them for the rest of their lives.

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