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Oral Health and Nutrition

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I. INTRODUCTION

WHO defines Oral health as "the state of the mouth, teeth and orofacial structures that enables individuals to perform essential functions such as eating, breathing, speaking and encompasses psychosocial dimensions such as self-confidence, well-being and he ability to socialize and work without pain, discomfort and embarrassment". The state of oral health varies with the age and plays integral part in maintaining general health of the body. There are numerous conditions that contribute to oral diseases like dental caries, periodontal conditions, oral cancer, tooth trauma, certain birth defects etc. Around 3.5 billion people gets affected by the oral diseases and are most common noncommunicable disease in the world. Oral diseases continue to put burden on the countries around the globe especially on low and middle-aged countries and this burden continues to increase with the growing population and ageing. People who belong to low socioeconomic status are more prone to get affected by the oral disease.

A balanced diet is very important to keep the body disease free including the oral cavity. It is a saying that "There is no health without oral health", which means that keeping the oral cavity healthy means keeping the overall body healthy and in turn it improves the quality of life. Tooth decay is the most commonly seen oral disease in the world. The oral cavity, also called mouth, marks its border starting from lips and ending at throat. Healthy mouth not just mean keeping the teeth disease free, but also to maintain the health of the periodontium and it supporting structures. Throughout life, teeth and oral tissues gets exposed to lot of environmental factors that can lead to unhealthy oral cavity. The most common oral diseases are caries and gums diseases which can also develop due to poor nutritious diet. The main dietary ingredient that contributes to the development of bad oral health is sugar. The average Canadian eats approx. of 40 kg of sugar each year.

WHICH EAT OR DRINK AFFECTS YOUR TEETH?

The key reason to maintain a healthy smile and healthy body is to have a proper good nutritious diet. Healthy mouth and nutrition are interrelated as proper nutrition keeps oral cavity healthy and in turn healthy oral cavity supports nutritional well-being. Choices of food we make plays an important role in preventing diseases of oral cavity. Minerals such as calcium and phosphorus play a crucial role in maintaining dental health by safeguarding and rejuvenating tooth enamel, which serves as the tough outer shield of the tooth. Interestingly, enamel stands as the toughest substance found in the human body. Consuming foods rich in calcium and other essential nutrients, such as cheese, milk, plain yogurt, calcium-fortified tofu, and almonds, can significantly support tooth health. Similarly, protein-packed foods like meat, poultry, fish, milk, and eggs serve as excellent sources of phosphorus.

In promoting a healthy smile, fruits and vegetables emerge as excellent choices owing to their high content of water and fiber, which helps to balance the sugars and cleans the teeth. Moreover, these foods promote saliva production, leads to the removal of the acids and food particles from the teeth, thereby neutralizing acid and shielding teeth from decay. Additionally, many fruits are rich in Vitamin C, A which are crucial for gums and essential for the formation of enamel respectively. Water stands out as the optimal beverage for dental health, especially when fluoridated. It plays a vital role in maintaining oral hygiene by cleansing the mouth and combating dryness. The presence of fluoride in water is essential throughout life to safeguard teeth against decay. Drinking fluoridated water is a simple yet highly effective measure in cavity prevention.

Carbonated water, also known as "sparkling" water, is generally considered a healthy choice for the teeth, according to available research. Although slightly more acidic than regular water, it is typically fine for dental health. It's commendable to substitute soda with carbonated water; however, it should not replace water containing fluoride. It's important to note that not all carbonated waters are equal. Citrus-flavored varieties may have higher acid levels, which could potentially pose a risk to tooth enamel. To mitigate this risk, it's advisable to consume these beverages in one sitting or alongside meals. Alternatively,

using a straw can help bypass direct contact with your teeth if you prefer drinking carbonated water outside of meal times. It's crucial to be aware that sparkling waters with added sugar are categorized as sugar-sweetened beverages, increasing the risk of tooth decay and other chronic health issues. Therefore, it's best to opt for plain carbonated water or those without added sugars for optimal dental health.

The dental health can be significantly impacted bysnacking habits. Plaque, a sticky film of bacteria that forms on teeth, accumulates if not removed daily. These bacteria in plaque utilize sugars from foods and beverages to produce acid, which in turn attacks tooth enamel. Even after finished eating or drinking, this "acid attack" can persist for up to 20 minutes. Consequently, snacking throughout the day or consuming sugary drinks over prolonged periods can increase the risk of tooth decay. Furthermore, excessive consumption of added sugars not only contributes to tooth decay but is also linked to various other health issues, including obesity, diabetes, and cardiovascular diseases.

MALNUTRITION AND ORAL HEALTH

Nutrition and oral health share a close relationship, as defined by the World Health Organization (WHO) “malnutrition encompasses deficiencies, excesses, or imbalances in an individual's intake of energy and/or nutrients”. This indicates that malnutrition can manifest as either over-nutrition or undernutrition. Dental issues such as pain or tooth loss can impair chewing or swallowing abilities, leading to decreased food intake or consumption of meals with lower nutritional value, consequently raising the risk of malnutrition. Deficiency of protein can lead to the development of salivary gland dysfunction and also delayed tooth eruption. Deficient levels of certain vitamins like Vitamin A can also lead to the development of impaired epithelial tissue development, tooth formation and enamel hypoplasia. Delayed eruption, loss of lamina dura, and other bone abnormalities can be seen in patients who have low levels of Vitamin D. Conversely, inadequate nutrient intake can hinder oral cavity development, exacerbate oral diseases, and impede proper healing. Nutrition plays a significant role in infection and inflammation processes. Inflammation, a vital component of the body's immune response to combat infections and injuries, can become detrimental if it becomes dysregulated. Consequently, inflammation serves as a prominent factor in numerous chronic diseases. Periodontal diseases and obesity are notable risk factors implicated in the initiation and advancement of chronic inflammation and its associated complications. Thus, the intricate interplay between nutrition and oral health underscores their reciprocal influence on each other. The safe levels of sugars a person can consume is 15 to 20 kg/person/year. If anyone consumes sugars less than or equal to this amount then he/she is less prone to develop dental caries.

With advancing research and studies shedding light on the connection between oral health and overall well-being, it's increasingly apparent that dental care extends beyond mere aesthetics and fresh breath. Emerging evidence indicates that inadequate oral health correlates with various systemic conditions, including heart disease, diabetes, pregnancy complications, and more. Conversely, maintaining optimal oral health can positively impact mental and overall health. Adopting good oral hygiene practices and scheduling regular dental check-ups, coupled with embracing a healthy lifestyle and minimizing risks such as excessive sugar consumption and smoking, are vital steps in preserving both your smile and your body's health. By prioritizing oral health alongside overall wellness, individuals can enhance their quality of life and mitigate the risk of developing systemic health issues associated with poor oral hygiene.

OBJECTIVE:

1. To assess the levels of nutrition and oral health awareness
2. To determine the relationship between nutritional status, oral practices and oral health among adult patients

II. LITERATURE REVIEW:

- Chan et al (2023) reported that oral cavity diseases and diet are interrelated with each other. The oral diseases include dental caries, periodontal diseases, even oral cancer. Improper dietary habits and poor nutritional intake leads to the increased risk of oral diseases such as dental caries, in older adults.
- Chan et al (2023) also states that poor oral health and poor nutrition increases with the age due to the physiological changes like age, medical conditions.
- Scardina & Messina (2012) reported that unhealthy diet id directly related to the risk factors of several chronic disease of the oral cavity.
- Scardina & Messina (2012) states that deficiency of proteins lead to the development of atrophy of lingual papillae, alteration in

dentinogenesis and cementogenesis, malocclusion and other oral cavity diseases.

- Mackenbach et al (2022) reported that severity of oral diseases is strongly associated with socioeconomic pattern.
- Tungare& Paranjpe (2023) states that deficiency of Vitamin C leads to delayed wound healing, dentin malformations, bleeding gums and defective collagen formation.

TECHNICAL PROGRAMME OF WORK:

This study will do cross-sectional survey design. Participants will be explained the objectives of the study and will be given right to participate or withdraw at any time during the study. The data will be collected and following information will be collected from the participants:

- Sociodemographic
- medical history
- oral health related practices
- nutritional status assessments
- oral health related nutritional knowledge
- oral health status.

Sample size will be calculated using t-test software with predetermined error of 5%. Total of 120 participants will be there for the study and there will be extra 30 participants incase any drops out of the study. All the participants will be selected based on convenient sampling technique. The participants selected from age group of 18-60 years old who had visited dental clinic for their checkup. Anyone suffering from any hereditary disease will be excluded from the study. The final participants will then be invited to fill out the questionnaire (Badrasawi et al 2020).

Research:

- Nutritional Knowledge Questionnaire: The questionnaire will be developed based on the diet, oral health and oral cavity diseases along with the nutritional knowledge.
- Nutritional and Oral Health Status Assessment: The evaluation of the participants' nutritional status involves several methods:
  - Anthropometric measurements: This included assessing body weight and height to calculate the Body Mass Index (BMI) for each participant. The World Health Organization (WHO) cutoff points will then be used to categorize the participants' nutritional status into obese, overweight, normal weight, and underweight.
  - Diet intake assessment: A Food Frequency Questionnaire (FFQ) will be utilized to evaluate the participants' dietary intake. This questionnaire likely included inquiries about the frequency of consuming various food items to gauge their dietary habits.
  - Dietary practices assessment: The questionnaire also likely includes questions about participants' nutritional practices to gather detailed information about their eating patterns and food choices.

Additionally, the participants' oral health was assessed by dentists from a selected clinic. The evaluation included:

- Overall oral health assessment
- Oral hygiene assessment: Will likely assessthe cleanliness of the participants' teeth and gums using standardized procedures, possibly including the Plaque Index.
- Gum health assessment
- Presence of calcification assessment: Check for the presence of calcification on the teeth, which may indicate issues such as tartar buildup. Assessment may have been done through visual inspection or with the aid of dental instruments.

The ratings for oral hygiene, gum health, and overall oral health were likely determined based on established criteria, possibly following procedures outlined in Carranza's Clinical Periodontology. This assessment may have included factors such as the presence of plaque, gingival inflammation, tooth mobility, and the presence of calcification. The overall oral health status may have been categorized as poor, fair, good, or excellent based on the evaluation criteria, and the presence or absence of calcification would have been noted separately (Badrasawi et al 2020).

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