

## Oral Manifestations of Malnutrition and Causes

Bashar Helail

MSc-Scotland, Post Graduate, Dip Bristol England.

**\*Corresponding Author:** Bashar Helail MSc-Scotland, Post Graduate, Dip Bristol England.

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### Abstract

**Introduction:** Malnutrition is a condition triggered by a lack of proper diet, unsuitable dietary choices, low income, or physical and mental conditions. A strong link exists between poor nutrition and oral well-being because a lack of accurate nutrients affects the gums and causes other problems related to the mouth. Likewise, weakened oral health such as incapability to chew, gum diseases, and missing teeth negatively affect the intake of nutrients. For example, chewing and consuming food on weakened teeth and swollen gums is impossible, resulting in nutritional deficiencies and other health complications.

**Objective:** To examine carefully the oral signs and symptoms of malnutrition

**Methods:** Different symptoms were analyzed

**Conclusion:** lack of a proper diet can affect the oral cavity dental structure, the periodontium, soft and hard tissue. And each is related to a deficiency of a nutrient type

**Keywords:** Oral Manifestations of Malnutrition, causes of oral manifestation malnutrition symptoms, relation between vitamin deficiency and dental/ oral structure.

### Oral Manifestations of Malnutrition and Causes

Studies by health specialists show that most people, both adults, and children, are vulnerable to the effects of malnutrition and oral diseases if they do not pay attention to their diet. In cases where patients were screened for malnourishment, the findings indicated that oral health was the common risk factor. Also, dentists in other case studies revealed that their patients lacked proper dietary schedules. Therefore, several investigations and findings indicate that several conditions in the mouth, such as periodontal diseases, ulcerative gingivitis, oral cancer, and edentulism, are all caused by various nutritional deficiencies; hence, they are signs of malnutrition.

First, poor nutrition stimulates dental caries formation and progression during the early stages of development this might be related to other dental changes such as:- the reduction in epithelial tissue development, Impaired tooth formation, enamel hypoplasia which might be related to the deficiency of Vitamin A, whereas the deficiency of Calcium and Vitamin are linked to other changes such as hypomineralisation and the absence of lamina dura which might contribute to the fast progression of dental caries.

Malnutrition is known to alter the homeostasis, which may cause the progression of diseases in the oral cavity, decrease the resistance to the biofilm, and reduce the healing rate of tissues (Kumar et al. 2013 178).

Studies show that protein energy malnutrition (PEM) could cause enamel hypoplasia, compositional fluctuations in saliva, and salivary gland hypofunction. Enamel hypoplasia is characterized by thinning of the hard protective layer of the teeth, and it results in the increased vulnerability to dental decay (Campisi et al. 2010, 620). Symptoms of this oral condition include white spots on teeth, susceptibility to sour foods and drinks, and sensitivity to very hot and cold substances. Likewise, salivary gland hypofunction, also known as dryness of the mouth, is the mechanism through which undernourishment is connected with dental caries regardless of this condition being one of the most underdiagnosed undermanaged oral health problems. Therefore, protein energy required by the body is interconnected with the oral health status of an individual.

Secondly, periodontal diseases, mainly caused by poor oral hygiene, are also a result of malnutrition, and they evolve faster in undernourished people. Individuals with poor dietetic intakes experience symptoms such as swollen and bright red- or purple-colored gums, bleeding gums, bad breath, and pus between the teeth. Deficiencies in vitamin B6 and C are associated with periodontal diseases, gingivitis, and other dental pathological progressions such as tooth wear and developmental imperfections (Najeeb et al. 2016, 530). Studies to create a correlation between periodontal health and nutrition have established that a properly balanced diet plays an important role in maintaining periodontal health. Besides, numerous vitamins and minerals are essential

in forming teeth and jaw bone structure and periodontal healing (Ardale et al. 2020, 13). However, poor nutrition and vitamin B deficiencies destroy the oral structures (Cagetti et al. 2020, 938). For example, lack of vitamin B complex affects a person by causing burning sensations in the mouth and the tongue. Other manifestations of challenges in the oral structure ensuing malnutrition include cracked lips, inflammation in the oral cavity lining, and cracks at the corners of the mouth (Jordan et al. 2016). A condition known as ariboflavinosis in the mouth is caused by a lack of vitamin B-2 (riboflavin). Likewise, this condition is displayed by swelling of the tongue, dryness of the mouth cavity, and fractured lips as well as angular cheilosis,

Bone changes such as abnormal alveolar bone patterns is due to the deficiency of several vitamins and minerals mainly calcium, Vitamin B12, Vitamin B6 and Vitamin D (Ehizele et al. 2009), as vitamin D allows the absorption of calcium and calcium is responsible for forming the mesh of collagen crystals which forms the bone, whereas the deficiency of Vitamin B6-will reduce G6PD activity in bone formation and callus development which makes bone more susceptible to osteoporosis and studies have linked between low level of vitamin B12 and bone (Dai and Koh, 2015).

Furthermore, effects of malnutrition have been experienced in oral cancer patients, and their ability to impair the functioning of the immune system has been a continuous threat in increasing the mortality rate. Oral cancer patients have deficiencies in almost all the essential nutrients required to build their body mass and weight (Kashiwazaki et al. 2017, 66). Therefore, they are faced with major weight losses, and a subsequent reduction of functioning of their oral structures since their condition discourages chewing and swallowing of food. Similarly, surveys in oral cancer treatment show that patients with poor nutritional status are more intolerable to the procedures than those with relatively good health (National Research Council, 2012.). Malnutrition due to oral cancer is a risk factor mainly for its tendencies to reduce patients' chances of survival (Bao et al. 2020, 1-8). Also, dental caries resulting from demineralization and dissolution of the hard inorganic structure of the tooth are a product of poor dietary choices (Saba et al. 2020). Although, this condition can be prevented, especially in children where it is most common by water fluoridation (Rugg-Gunn, 2013, 7). Generally proper nutritional meals and balanced diets are considered and other sanitary preventative methods of eliminating and preventing tooth decay.

Lastly, an oral manifestation of malnutrition known as total or partial edentulism is characteristic of several missing teeth, and it is caused by poor diet and pre-existing ailments. In this regard, this condition might result from unsuccessful treatment of periodontal diseases, which similarly are the proceeds of poor nutritional decisions. Although most people consider tooth loss a normal aging process, edentulism results from poor oral health and a lack of proper medical attention (Gift et al. 1998, 679). Indications of this condition are showcased by the lack of restoration of the masticatory purposes with dental prosthetic devices in patients (DéadachnahÉireann, 2013). People with edentulism and tooth loss face challenges regarding food consumption since their ability to chew is completely terminated or limited to some extent (DeBiase et al. 2003, 77). In such cases, uptake of the essential nutrients required to perform the functions of tissue formation is hindered, and in most aging adults, the situation results in sarcopenia (Azzolino et al. 2019, 2898). Loss of tissue and skeletal muscle impairs movement, leading to disability. Therefore, patients who suffer from edentulism are psychologically challenged since their self-sufficiency diminishes with loss of movement, completely changing the quality of their life.

In conclusion, there is an irrefutable correlation between oral health and malnutrition; lack of a proper diet is a limiting factor to one's oral health. Most of the problems associated with the mouth and its structures can easily be solved by taking into caution and implementation

the most appropriate dietary options and solutions available. Given that most diseases such as periodontal diseases, tooth decays, and loss onset during the early stages of teeth development, parents are more tasked to take care of their children's dental needs. However, studies that prove dental problems in adults due to age have been conducted. Also, researchers have established a difference in response to treatment procedures in cancer patients in relation to their body masses. For example, malnourished cancer patients are highly intolerant to chemotherapy than those that are well-nourished. Therefore, other solutions to malnutrition in patients whose chewing and other mouth functions have been incapacitated should be established.

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