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## Risk factors associated with tooth wear: A scoping review

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### Abstract

**Introduction:** Nowadays it is more frequent that patients present occlusal wear of the dental organs, in such a way that they lose dental pieces in the same way affecting their mastication and their self-confidence.

**Objective:** To analyze these factors such as sociodemographic, eating habits, vicious habits, psychological factors and symptoms that contribute to generalized occlusal wear.

**Methodology:** A literature review was carried out in PubMed, Scopus and Google Scholar databases using the keywords: tooth wear, eating habits, sociodemographic, oral habits, psychological factors, and Boolean parameters AND, OR and NOT.

**Results:** The sociodemographic factor does have a crucial effect on dental wear, since the habit of oral hygiene significantly affects males, but not only males, but also the lifestyle of the population has an influence. Diet is the factor that most affects dental wear because many foods contain chemicals and acids that demineralize tooth enamel. When presenting a vicious problem they have to present many problems in their oral health and one of them is also wear of their dental organs since alcohol, drugs can induce to have problems of the gastrointestinal tract. Stress and depression are psychologically important factors since the stress of work, loss of a family member not only affects systemically but also in the oral cavity, resulting in occlusal wear and even fracture. Dental wear, temporomandibular disorders, headaches and sleep disturbances are symptoms that bruxers may present.

**Conclusion:** Multiple associated factors were found to influence the occlusal wear of the dental organs. Addressing this wear requires a comprehensive approach that goes beyond the expertise of a single specialist.

**Keywords:** "Tooth wear", "sociodemographic", "eating habits", "oral habits", "psychological Factors"

### 1. Introduction

Tooth surface loss or tooth wear is an irreversible loss of the hard structure of teeth caused by factors other than those responsible for dental caries [1]. It is also a complex multifactorial process related to the loss of tooth tissue, due to chemical or mechanical processes, by abrasion, wear and erosion [2]; without plaque or bacteria and has been a growing phenomenon in the general population worldwide [3]. Dental enamel is known to be the hardest outer layer of a human tooth, it is subjected to occlusal forces throughout life during different oral functions, such as speaking, chewing, and due to this continuous stress, wear causes the loss of this protective shell [4]. Restoration of excessively worn dentition is a challenging treatment procedure which requires an efficient diagnosis and treatment plan [5]. Several factors contributing to tooth wear have been highlighted in studies. These factors are classified into nine domains: sociodemographic factors, medical history, alcohol consumption habits, dietary habits, oral hygiene habits, dental factors, bruxism and temporomandibular disorders, behavioral factors and stress [6]. Additionally, the degree of wear is another important diagnostic factor as it can help assess an individual's developmental age [7]. Restoration is not

only relevant to adequately assess the risks, benefits, costs, reasonable alternatives and likely prognosis of the proposed treatments, but also to elaborate the expected impact of the intervention on the patient's oral health-related quality of life<sup>[8]</sup> since it is diagnosis, disease control and prevention are the precursors to successful definitive restorative treatment of pathologic tooth wear<sup>[9]</sup>. The most common complaints are dissatisfaction with dental appearance and a negative impact on the experience of oral health-related quality of life<sup>[10]</sup>. Analyzing the literature it is observed that there is no adequate review about factors that contribute to generalized occlusal wear in patient with depression and alcoholism therefore the aim of this work is to analyze these factors such as sociodemographic, dietary habits, vicious habits, psychological factors and symptoms that contribute to generalized occlusal wear.

## 2. Materials and methods

Articles on the subject published through the PubMed, Scopus and Google Scholar databases were analyzed, with emphasis on the last 5 years. The quality of the articles was evaluated using guidelines, i.e., identification, review, choice and inclusion. The quality of the reviews was assessed using the measurement tool for evaluating systematic reviews. The search was performed using Boolean logical operators AND, OR and NOT; with the keywords: "tooth wear" related to "eating habits", "sociodemographic", "oral habits", "psychological factors". The keywords were used individually, as well as each of them related to each other.

## 3. Results & Discussion

### 3.1 Sociodemographic factors

Dental preoccupation was frequent among pregnant women, being significantly related to negative dental experiences, pain or discomfort, as well as reasons and time since the last visit to the dentist<sup>[11]</sup>. In one study, sociodemographic factors such as age, gender and race of the child increased the risk of dental caries in certain groups of the child population. It was highlighted that male children were significantly associated with decayed teeth and lack of dental fluoride treatment, on which there is limited information in the literature<sup>[12]</sup>. Although bruxism is common, it has been revealed that gender and psychosocial factors are mainly linked to its origin<sup>[13]</sup>.

Parental education influences several health outcomes, including the oral health and well-being of their children. It is crucial that parents understand the importance of their children's oral health and take steps to ensure the best possible care<sup>[14]</sup>. In addition, limitations related to aging and tooth wear vary among individuals due to factors such as age, diet, environment, and gender<sup>[15]</sup>. Tissue loss on the occlusal surface of teeth is often associated with lifestyles, habits and physical properties of the food consumed, including preparation techniques<sup>[16]</sup>.

In an analysis of risk factors, family factor, age, gender, extracurricular study time, oral hygiene habit, bruxism, unilateral chewing and acidic diet were found to be related to the prevalence of erosive tooth wear<sup>[17]</sup>.

Socioeconomic factors significantly affect tooth wear. This is because they influence oral hygiene habits and lifestyle choices, both of which can contribute to tooth wear.

### 3.2 Eating habits

Frequent consumption of erosive products is common, which raises the risk of dental wear, especially in children<sup>[18]</sup>.

Among young adults, frequent daily consumption of exotic fruits or fruit juices with dietary acid has a prevalence of wear of 73%, according to one study<sup>[19]</sup>. The severity of tooth wear is affected worldwide by dietary habits, lifestyle, abrasion, and bruxism<sup>[20]</sup>. One study suggests that dental damage in carnivores reflects changes in diet and feeding habits, particularly in large carnivores associated with increased consumption of bones or very hard foods such as ice<sup>[21]</sup>.

Tooth loss is linked to suboptimal nutrient intake and increased risk of malnutrition<sup>[22]</sup>. Adults with an omnivorous diet have been observed to have an increased risk of periodontal problems and dental caries, while vegetarians/vegans may face an increased risk of dental erosion<sup>[23]</sup>. A study reveals that consumption of potato chips and cereal products increases dental caries, while dental erosion is associated with consumption of fruits, vegetables, meat, fish and alcoholic beverages. In addition, consumption of sugar, sweets and alcoholic beverages is associated with a higher rate of caries and bleeding on probing<sup>[24]</sup>.

Variation in the size and shape of molar crowns in primates plays a key role in the adaptation of species to their environment. In general, consumption of herbaceous foods is associated with increased dentin and enamel wear<sup>[25]</sup>. Tooth wear represents a relevant oral health problem, especially at younger ages, although continuous acid exposures may contribute to tooth wear<sup>[26]</sup>.

Diet is the factor that most affects dental wear because many foods contain chemicals and acids that demineralize the tooth enamel, so as long as a low-sugar diet is not followed, periodontal disease, dental caries and wear cannot be treated to help the population.

### 3.3 Oral Habits

Significant warning signs and manifestations of reported oral health care habits, such as the use of interdental aids and harmful habits (nail biting, bruxism), may be related to certain aspects of lifestyle. These periodontal signs include factors such as perceived stress, smoking, participation in maintenance sports and alcohol consumption<sup>[27]</sup>.

In one investigation it was observed that distilled alcoholic beverages caused a significant reduction in hardness and roughness, as well as an increase in erosion, including all bulk filler resin compounds<sup>[28]</sup>. Superficial erosive disease of the stomach, commonly associated with risky alcohol consumption, manifests through gastric acidity and the detrimental impact of alcohol on the gastric mucosa<sup>[29]</sup>. Alcohol use disorders have a negative impact on both the overall health of the individual and the lives of their family and friends, being the least treated mental illness with serious public health implications<sup>[30]</sup>.

Problematic alcohol use has detrimental effects on the health, functioning, and long-term prospects of young people, with traumatic events being a possible driver of problematic alcohol use<sup>[31]</sup>. Although heavy alcohol consumption can induce pathological changes, including carcinogenesis in the digestive tract from the mouth to the large intestine, the underlying mechanisms are not yet fully understood<sup>[32]</sup>. Although control of alcohol consumption is an attractive treatment goal for many individuals with alcohol use disorder, the availability of treatment methods that support this control goal is limited<sup>[33]</sup>.

People who present a vicious problem are likely to have many oral health problems and one of them is also dental organ decay since alcohol, drugs can induce gastrointestinal tract problems and therefore their acidity will only demineralize

the enamel.

Hard tissue losses in teeth caused by frequent acid exposure, such as in situations of recurrent vomiting without mechanical stress implications, are also classified as dental erosion<sup>[34]</sup>. Erosive tooth wear constitutes the classic paradigm of the interaction between environment and genetics. This process involves exposure to acids, generally derived from the diet or gastric contents of the individual, and presents variation among different individuals and populations, indicating that it is influenced by more than one gene, each with individual effects of small magnitude<sup>[35]</sup>. Regular consumption of acidic beverages such as beer, red wine and white wine may increase the risk of dental erosion<sup>[36]</sup>.

Oral habits refer to acquired behaviors that have become almost or fully automatic<sup>[37]</sup>. Bruxism is a repetitive chewing muscle activity characterized by clenching or grinding of the teeth, and/or jaw clenching or thrusting, and can be classified as sleep bruxism or awake bruxism<sup>[38]</sup>. It is essential to consider the teeth not in isolation, but as part of the articulatory system, which includes the teeth, temporomandibular joints, and interrelated muscles<sup>[39]</sup>. Sleep bruxism (SB) has been linked to biopsychosocial factors, and its assessment encompasses self-report, clinical assessment, polysomnography, and self-report in relation to other sleep disorders, as well as demographic, psychological, and lifestyle factors in the general adult population<sup>[40]</sup>. SB is defined as an oral behavior involving intense repetitive muscle activity of the jaw muscle during sleep, leading to grinding and clenching of the teeth, and can evolve into a disorder<sup>[41]</sup>.

One investigation revealed that most respondents reported that between 1% and 3% of their patients had bruxism, and the diagnosis is mainly made by non-instrumental methods. Facial pain and dental wear are the main clinical consequences associated with bruxism<sup>[42]</sup>. High levels of oral behavior and OBC scores were found to be related to chronic temporomandibular disorders (TMD) and painful disorders, with sleep bruxism being the strongest predictor of TMD pain. Another contributing factor is age and marital status<sup>[43]</sup>. Bruxism is a movement disorder of uncertain origin, where, in addition to local peripheral and central psychological factors, the influence of certain drugs is suspected<sup>[44]</sup>.

Bruxism, or teeth grinding, can also cause dental wear. This wear is most often associated with age, but it can also be caused by the acidity of food and beverages, which can lead to erosion.

### 3.4 Psychological Factors

Post-traumatic stress disorder, major depression and anxiety are non-communicable high-pressure conditions that are associated with years of life lived with disability<sup>[45]</sup>. Depression is associated with increased global disease burden and increased mortality risk in Western populations<sup>[46]</sup>. Occlusal loading stress plays a role in the development and progression of enamel lesions. Regardless of the mechanism of development, demineralization occurs, being one of the most common demineralization diseases in the body<sup>[47]</sup>.

Stress and depression are psychologically important factors since the stress of work, loss of a family member not only affects systemically but also in the oral cavity, resulting in occlusal wear and even fracture.

Bruxism and certain headache conditions often manifest together, although there is no strong evidence to support a common pathophysiological mechanism<sup>[48]</sup>. Bruxism is characterized by a varied combination of signs and symptoms, such as dental wear and fractures, dental impressions in soft

tissues, temporomandibular disorders, headaches, as well as behavioral and sleep disorders<sup>[49]</sup>. Patients with episodic migraine often report poor sleep and are at increased risk for some sleep disorders, such as insomnia, sleep-related bruxism, and restless legs syndrome<sup>[50]</sup>.

Bruxism frequently results in temporomandibular joint pain, masticatory muscle pain, mechanical wear of teeth, prosthodontic complications and cracked teeth. However, there is still not enough information to establish and support a standardized approach to its treatment<sup>[51]</sup>. The incidence of chronic root fractures due to fatigue is 0.76%, occurring mainly in elderly males, in worn posterior teeth and in teeth without restoration<sup>[52]</sup>.

Tooth wear, temporomandibular disorders, headaches and sleep disturbances are symptoms that bruxers may present.

## 4. Conclusions

In conclusion, various socioeconomic factors, oral hygiene habits, diet, dental caries, bruxism and emotional conditions such as stress and depression have a significant influence on dental wear and its consequences. These factors emphasize the need for a comprehensive approach to oral health, considering both behavioral and emotional aspects in order to provide effective treatment and improve the quality of life of the population.

## 5. Conflict of Interest

Not available

## 6. Financial Support

Not available

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