



Relationship between bruxism and orofacial dysfunction and psychosocial problems developed by the SARS-CoV-2 pandemic: a literature review

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Abstract

In 2019, the world was struck by a viral pathology that affected not only people's physiological health but their mental health. The coronavirus directly affects the respiratory system of an infected individual, causing serious breathing problems that have led to many deaths. However, not only respiratory complications were a consequence of COVID-19, but the development of psychological illnesses was quite common, a result of the drastic change in life that people had to go through and face the fear of uncertainty. This directly affected people's oral health, causing problems such as temporomandibular disorders (TMD) and bruxism to occur more frequently in people. This work aims to carry out a literature review, of articles taken from online databases, such as PubMed, Scielo, and Google Academic, to analyze the increase in cases of occlusion problems generated in the pandemic as a result of stress, anxiety, and depression. developed by people during the pandemic, in addition to showing diagnosis and treatment carried out by dental surgeons on the front line of contamination (the oral cavity).

Keywords: Pandemic. COVID-19. Temporomandibular dysfunction. Bruxism.

Introduction

At the end of 2019, in Wuhan, China, the World Health Organization (WHO) was informed of the emergence of a new type of pneumonia that had unknown causes. A new viral agent from the coronavirus family, severe acute respiratory syndrome coronavirus 2

(SARS-CoV-2), was identified as causing the onset of this respiratory disease [1]. As the days went by, the virus spread across the world in devastating proportions, reaching several countries and becoming a major challenge for public health.

The World Health Organization (WHO) announced the outbreak of COVID-19 in March 2020 [2]. The changes that were imposed on daily life, to try to slow the spread of the virus, such as quarantine, social distancing and interruptions in daily activities may have led to problems with people's mental health [3]. The COVID-19 pandemic has caused significant suffering to millions of people around the world. The most common psychosocial responses to the pandemic are stress, anxiety, and depression [4]. Problems arising from the temporomandibular joint, causing dysfunction of this anatomical structure, and bruxism are extremely associated with psychosocial factors, such as those previously reported [5-7].

Bruxism is a parafunctional muscular activity of the masticatory system, where the chewing muscles clench and grind the jaw teeth with the jaw teeth (centric and eccentric bruxism). During sleep, rhythmic muscle contractions occur, with a contraction force greater than natural, which causes teeth grinding, noise, and friction that are not reproduced during periods of consciousness, according to the International Classification of Sleep Disorders (ICSD) [8].

Bruxism can cause muscular changes in the head and face region. Symptoms such as fatigue of the masticatory muscles and increased tension, where the lateral pterygoid, masseter, and temporal muscles are

one of the most affected. Myalgia, myositis, asymmetric muscular activity, increased muscle tone, spasms, formation of paintriggering zones, lack of muscular coordination, contracture, change in the normal rest period, contraction prolonged overstretching, and increase in electrical activity may also occur. Fatigue is the most frequent consequence, incapacitating the muscle from resisting sustained effort, without signs of pain and discomfort becoming apparent [9].

In this scenario, temporomandibular dysfunction (TMD) is a condition of restriction of mandibular movements, hyperesthesia, and pain in the chewing, head, and neck muscles, which cause headaches and sounds in the temporomandibular joint (TMJ). Females are generally more affected, in people between 20 and 40 years of age [9]. It is a disease with multifactorial etiology, where anatomical, neuromuscular, occlusal, and psychological problems can lead to joint and muscular dysfunction [10]. In a survey carried out, it was possible to observe that the SARS-CoV-2 pandemic had high rates of anxiety (49.6%) and depression (38.9%) during the period of quarantine and social isolation, and consequently, it increased in cases of TMD and bruxism in the population [11].

Considering the high rates of psychosocial disorders (stress, anxiety, and depression) that were seen during the pandemic, this study aimed, through a literature review based on articles obtained from an online database, to verify the influence that pathologies of emotional origin, caused by COVID-19, have had on the increase in cases of bruxism and temporomandibular disorders in people.

Methods

For this article, a bibliographical survey was carried out in the online databases, PubMed, Scielo, and Google Scholar, using the keywords "bruxism", "COVID-19 pandemic", "Temporomandibular dysfunction", "psychosocial factors", "anxiety", "depression" and "stress", allowing all the words that contained the fragments to be identified, facilitating the selection and choice of publications that fit the study's inclusion criteria for subsequent analysis, thus searching for texts that related health problems. psychic origin triggered by the moment experienced in the SARS-CoV-2 pandemic, with occlusal diseases and the work of the dentist in treating these pathologies of oral origin.

The publication date of the selected articles was from the beginning of 2019 to 2021, the active period of the pandemic. Furthermore, inclusion criteria included complete works available for reading, review articles on the topic, systematic reviews, clinical trials, and case reports. The criteria for exclusion, in turn, were

duplicate works, monographs, dissertations, abstracts, theses, course completion works, and publications that did not directly address the research topic.

Results and Discussion

Bruxism consists of the habit of clenching or grinding your teeth and is common in around 15% of the population. A survey carried out by the American Dental Association (ADA) reports that 95% of the North American population has teeth-grinding habits at some point in their lives [12]. In the past, it was believed that bruxism was directly linked to morphological factors, such as the anatomy of the facial bone structures and occlusal characteristics. However, new research shows that teeth grinding and clenching have multifactorial causes, going beyond morphological characteristics, but also psychosocial characteristics and genetic factors. Psychosocial causes are linked to the development of depressive conditions, stress, anxiety, and the inability to express feelings of anger and fear, making individuals more likely to become witches [13].

There are no conclusive studies on genetic factors, showing that bruxism can be an inherited condition, but the family environment is more or less stressful favors its development, in addition to studies showing that children of bruxing parents tend to develop this condition more easily than children of parents who do not have bruxism [12]. The set of dysfunctional conditions, which present pain, involving the masticatory muscles, temporomandibular joints, and associated elements, is called temporomandibular dysfunction (TMD) [14]. Regional pain, joint noises, and movement limitations are the most common and prevalent characteristics of TMD [15].

With a multifactorial and complex etiology, TMD can occur in association with biological, environmental, emotional, social, and cognitive factors. The main causes are trauma, occlusion, stress, anxiety, general emotional condition, stimulation of deep pain, and parafunctional activities. Less frequent causes can be associated with TMD and cause pain, such as chronic headaches, fibromyalgia, and autoimmune disorders, such as rheumatoid arthritis and Sjögren's Syndrome [16].

The prevalence of TMD cases in men is three to nine times lower than in women, and about age, people between 20 and 40 years old are more affected [17]. An evaluation carried out showed the influence of stress and anxiety in cases of TMD, in individuals who presented a clinical case, 88.9% were female and 51.4% were students [18]. A study carried out with dentistry students in Riyadh, Saudi Arabia, evaluated the prevalence of TMD and its association with anxiety and

depression in the student body, with 49.5% having TMD and 30.8% showing signs of anxiety, the female public is also most affected [19].

A relationship can be made with the strong prevalence of TMD in females, due to the physiological association of women, where they become more sensitive in moments of physical and psychological tension, which can hinder the stability of the TMJ [20]. The risk of anxiety in women is 3.01 times higher compared to men, showing a possible justification for TMD cases affecting women more [21]. In addition, it was found that diseases such as depression, and anxiety, in addition to daily conditions such as stress, were greater in women during the COVID-19 pandemic, showing that women are more likely to develop TMD, caused by the stress suffered during the COVID-19 pandemic period [22].

Some studies show that females were the most psychologically affected during the SARS-Cov-2 pandemic [21]. Others found that the incidence of psychologically affected men and women during the pandemic period was equivalent, where the stress levels of both were similar [23]. A variety of studies have reported the association between symptoms triggered by TMD and psychosocial factors, both at the onset of the pathology and in its progression. Anxiety and depression play a fundamental etiological role in triggering parafunctional habits, in addition to increasing their frequency and intensity.

These parafunctional habits overload the masticatory muscles, due to their hyperactivity, and the temporomandibular joint, resulting in the emergence of TMD symptoms. Therefore, when correlating the etiology of diseases (bruxism and TMD) that affect the stomatognathic system as a whole (muscles, joints, and dental occlusion), parafunctional habits overload the entire functional structure of the head and neck and lead to TMJ joint overload [22].

Correlating the etiology of temporomandibular disorder and its incidence, high levels of stress and anxiety are its biggest cause during graduation, as this promotes high levels of muscular tension in students, fluctuations in the emotional state, and the progression of musculoskeletal disorders. Thus, a range of studies have revealed the relationship between depression and anxiety with the development of temporomandibular joint dysfunction [24].

The SARS-Cov-2 virus is the etiological agent responsible for causing the COVID-19 disease, a contagious pathology that was first identified in the city of Wuhan, China in December 2019 [15]. It is transmitted through droplets of saliva, which can be expelled through coughing, sneezing, or coming into contact with infected surfaces. This disease was

declared a pandemic in March 2020 by the World Health Organization (WHO), following a worldwide outbreak and the high rate of spread of COVID-19 [25].

The emergence of numerous oral health problems is a result of the SARS-Cov-2 pandemic. Oral problems have two types of classification. The primary classification, where oral health problems are directly linked to the COVID-19 virus, and the secondary classification, where problems in the oral cavity and adjacent structures are related to stress and anxiety resulting from the pandemic [26]. Numerous oral diseases can originate from psychological disorders, which consequently lead to sensory and functional disorders in the stomatognathic system [27].

Several studies were carried out to evaluate the psychological impact and some psychosocial aspects that people had at the beginning of the COVID-19 pandemic. In one of the studies, a third of the people interviewed reported moderate to severe anxiety and the psychological impact as moderate to severe [21]. Another study observed the fluctuation in people's behavior and mental health during the evolution of the pandemic, where the highest values were found after the peak of cases and the decline in values after the reduction in cases of the disease [28].

The student body at universities has also been affected by the pandemic. In a study with university students, it was shown that stress and depression levels during the COVID-19 pandemic had a considerable increase when compared to other common periods, that is, before the spread of SARS-Cov-2 around the world [29]. In addition to students, healthcare professionals have shown an increase in cases of anxiety during the coronavirus pandemic [14]. Looking at the general population, the prevalence of anxiety cases during the COVID-19 pandemic was 31.9% [30]. Among patients infected with the coronavirus, 34.7% had anxiety [31]. Furthermore, studies show that stress increases the frequency and intensity of cases of TMD and bruxism, as a result of an increase in parafunctional habits that increase neural electrical stimuli beyond what is common in the masticatory muscles and cause overload in the temporomandibular joints. It was also shown that the hormone cortisol, released in moments of stress and tension, increased in moments of greater muscular activity and severity of TMD, where it was detected by electromyography, salivary cortisol, level of temporomandibular disorder activity, and muscular activity [22].

In another analysis, it was found that patients with bruxism presented anxiety to a greater degree than patients who did not have signs of bruxism [32]. Converging, research carried out regarding psychosocial problems and parafunctional habits that cause TMD and

bruxism, anxiety, and stress are identified as factors causing oral joint and occlusal problems [33]. As well as morphological factors related to the bone anatomy of the orofacial region and occlusal discrepancies, were those that had less relevance in the etiology of bruxism [34,35].

Conclusion

Given the data observed and studied in this article, problems of occlusal and oral joint origin, such as bruxism and TMD, are directly linked to psychosocial factors developed in the COVID-19 pandemic, such as stress, anxiety, and depression. It was also shown that the moment the world went through with the spread of the virus, changing lifestyle habits caused direct problems in people's mental health. More review studies, meta-analyses, and clinical studies on the type of prevalence, distribution, and possible etiologies related to the oral problems addressed, and the coronavirus pandemic should be carried out, to seek greater knowledge about this, new treatment strategies and facilitate the diagnosis of patients with these conditions.

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