



## Psychophysiological and Oral Impact of The Covid-19 Health Crisis

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| Article History                                                           | Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| Received: 06 June 2023<br>Revised: 05 Sept 2023<br>Accepted: 11 Sept 2023 | <b>Aim:</b> The infectious disease known as COVID-19, caused by the SARS-CoV-2 virus, has had a diverse impact on the population, affecting each person individually. <b>Material and method:</b> As a measure to curb its rapid spread, a mandatory quarantine was implemented involving the isolation of both carriers and non-carriers of the disease. This situation has triggered negative psychological and oral responses, generating disorders such as stress, depression and anxiety, which are characterized by alterations in cognition, emotional regulation and behavior. <b>Statistics and Result:</b> In addition, oral manifestations such as bruxism, periodontal disease and other lesions have been observed. The purpose of this literature review is to investigate the possible relationship between the oral and psychophysical state of people due to the isolation caused by the pandemic and COVID-19 disease. |
| CC License<br>CC-BY-NC-SA 4.0                                             | <b>Keywords:</b> Frontal sinus, sex determination, radiograph, Maxillary sinus, pyriform aperture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### 1. Introduction

The COVID 19 pandemic has created a global public health and mental health crisis, as a result of the speed of its contagion, a mandatory quarantine was decreed that isolated carriers and non-carriers of the disease. SARS-COV-2 brought negative physical, psycho-mental and oral results of individuals (Morón, 2021).

The subject is a social being who needs coexistence with others to develop their skills and abilities, if they are subjected to confinement against their will, they tend to change their way of thinking and acting based on what they are living, triggering their mood in mental pathologies such as anxiety, stress and depression, the characteristics of which can significantly affect our oral health and stomatognathic system.

In recent years, much research has directed its efforts toward the study of mental illness. Anxiety is an active normal emotion and function that facilitates the individual's ability to respond, but when its intensity, frequency or duration is altered, it poses a threat to the normal function of the organism.

The time of crisis due to the COVID-19 pandemic has resulted in an outcome of emotions that increase stress in the population, this state is characterized by the presence of physical and psychological alterations ranging from tension, frustration, nervousness and among others, which appear due to situations in which the human being does not have an adequate coping mechanism.

Depression is a mood disorder that is characterized by the presence of a set of symptoms that last for a certain time (3 weeks or more) among its main symptoms are deep sadness, unwillingness to perform activities that were previously enjoyed, apathy, insomnia, lack of appetite and difficulty in developing in the main areas on a personal level, social, family, academic and work.

At the oral level, the most frequent manifestations associated with COVID-19 correspond to the presence of periodontal disease, this disease is a very common condition, which begins with inflammation of the gingiva. If this inflammation is not treated, it progresses to irreversible damage to the gingiva, alveolar bone and periodontal ligament, and consequently the loss of the tooth.

Bruxism, characterized by tooth tightening and grinding, is considered a phenomenon regulated by the central nervous system, frequently occurs during sleep. In addition, it is influenced by psychosocial and postural factors, which indicates that oromandibular parafunctions, temporomandibular disorders, malocclusion, high levels of anxiety and stress, among others, could influence the occurrence of bruxism (Firman et al., 2015; Medina, 2021; Castro, 2021).

The objective of this literature review is to investigate a probable relationship between the psychomental and oral state of people due to isolation due to the Covid-19 pandemic and disease.

Relationship between psychomental state and oral manifestations resulting from isolation and COVID-19

The relationship between oral pathologies and the impact on mental health caused by the pandemic has generated multiple research questions for the authors, who vary in ideologies and verifications through studies carried out in different populations.

At present, various oral lesions have ambiguous etiology, but according to the literature, it has been established that their causes carry components that are inherent to the human psyche and indirectly affect the oral health of a person.

The oral cavity is home to various diseases of local and systemic origin, in this place, damages of controversial etiology develop, which are multifactorial in nature, in which psychological factors constitute an important variable to consider. Oral edema disease, recurrent aphthous stomatitis and burning mouth syndrome are considered worthy of investigation as psychiatric diseases caused as a result of the sequelae of having participated in isolation by COVID-19.

According to the referenced literature, the effect of stress on periodontal disease, and the scientific evidence of the psychological state has been described as a risk factor for sporadic periodontitis and other pathologies caused by it such as bruxism.

Patients who report suffering from stress are also linked to bruxism, which is the habit of grinding teeth together. Being subjected to situations that demand a high level of attention causes neuromuscular reactions in the patient that in the oral cavity are reflected as the wear of a portion of the dental structure by the constant contact between antagonistic teeth.

Thus, it is considered as a problem that has manifested itself with great discomfort, since many dentists have seen in their consultations more broken teeth than normal because of these psychosocial problems generated by the COVID-19 pandemic (Parra, 2019).

The deterioration of the psycho-emotional state resulting from the pandemic has been related to the presence of oral diseases such as: lesions in the oral mucosa since it could be the first scenario infected with SARS-CoV-2, as well as infections of the salivary glands such as Mumps that according to the literature has reported common symptoms in the different reports, which involve pain in the auricular region, unilaterally followed by facial and / or cervical swelling progressive retromandibular or preauricular, associated with inflammation of the parotid and submandibular glands without erythema, induration and fluctuation accompanied in some cases by trismus.

About the condition known as COVID tongue, specialists indicate that the coronavirus tongue has unique characteristics with lesions at the level of the mouth, the tongue wide, erythematous, without the taste buds. This condition of the tongue and mucosa of the mouth gives itching and burning sensation on the tongue. Oral manifestations may occur between 4 days before the onset of respiratory

symptoms and up to 12 weeks after the onset of symptoms. It is not very specific, but it was observed that it is more frequent in relation to the decrease of smell and taste.

Other manifestations such as the presence of erythematous lesions, ulcers – blisters, but after recovery from the disease, with association with skin lesions that required antifungal therapy, suggesting that these skin lesions were fungal.

In addition, it is important to mention if such reactions in oral cavity are the result of effects by medications used during the treatment of COVID-19, such as: viral enanthema, and rashes, necrotizing ulcerative gingivitis, dry mouth, prominent lingual papillae, and chapped lips. Therefore, in the last two years it has been considered of wide and current interest, since its prevalence is still unknown and uncertainty remains whether these oral manifestations correspond to a clinical pattern of SARS-CoV-2 infection, systemic consequences, possible coinfection, suppression of the immune system or as adverse reactions to pharmacological treatments (Flores & Sanchez, 2021; Enríquez, 2021; 22).

Oral lesions could be due to many other factors, such as stress caused by restrictions on social life during the pandemic lockdown, lack of oral hygiene, work pressure or the herpes simplex virus, a complete anamnesis being essential to get to know the true etiology of the lesion, since there is a risk of developing opportunistic infections, as well as adverse reactions due to a susceptible oral mucosa.

While the SARS-CoV-2 genome was detected in saliva in most patients with this disease and in some cases, it was only detected in saliva, with no evidence for its presence in the nasopharynx, we must be cautious when associating COVID-19 with oral ulcers, as there are many viruses that could affect the oral cavity with ulcers.

In addition, the emotional stress associated with home quarantine, confinement and infection of dear friends and family also endangers health and complicates the picture, so more studies are needed to determine if oral manifestations are common in patients affected by SARS-CoV-2 infection or if the emotional distress of the situation itself could trigger such injuries.

## **2. Materials And Methods**

An exhaustive bibliographic review was carried out that included the search and selection of articles published in high-impact journals, following the established criteria and in accordance with the objectives of the research.

For the selection of articles, inclusion and exclusion criteria were applied. Inclusion criteria included articles in full-text format, written in Spanish and published between 2015 and 2021. In addition, priority was given to case reports, literature reviews and systematic reviews that addressed oral manifestations, mental manifestations and their relationship with the SARS-CoV-2 disease, since these aspects were of interest for research.

On the other hand, exclusion criteria were applied to discard those articles that did not meet the inclusion criteria or that were not directly related to the topic of interest. Review publications, letters from the editor, paediatric articles and any articles that were not directly related to the research topic were excluded.

The search and selection of articles was carried out systematically and thorough analyses were carried out to ensure the quality and relevance of the selected studies. The literature review focused on obtaining updated and relevant information on oral manifestations, mental manifestations and their relationship with SARS-CoV-2 disease, in order to support the findings and conclusions of the research.

An exhaustive bibliographic review was carried out that followed inclusion and exclusion criteria for the selection of articles. Priority was given to high-impact studies that addressed oral manifestations, mental manifestations and their relationship with SARS-CoV-2 disease. This literature review provides a solid base of scientific evidence to support the research findings and conclusions.

To carry out an effective search, a specific strategy was implemented in the PubMed, Google Scholar and Scielo databases. The search strategy was designed to retrieve relevant articles that addressed the psycho-mental and oral aspects associated with COVID-19 disease.

The search strategy was based on the combination of key terms and subject headings (Mesh) to optimize the retrieval of relevant articles. The main terms used were "Covid 19" and "Mental Health". These terms were selected because of their relevance to psychological aspects related to COVID-19 disease.

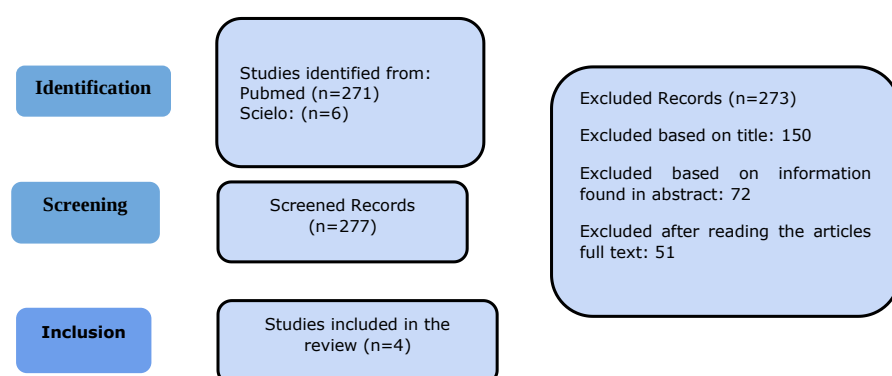
In addition to the main terms, additional keywords were used to broaden the search and cover different related aspects. These keywords included terms such as "COVID-19," "stress," "depression," "anxiety," "oral manifestations," "periodontitis," and "bruxism." These keywords were selected to capture specific aspects related to the psycho-mental and oral effects of COVID-19 disease.

The search strategy was applied in the databases PubMed, Google Scholar and Scielo, which are recognized for their wide scope and coverage in the field of medical and scientific research.

By implementing this exhaustive and well-defined search strategy, it was possible to obtain a wide range of articles related to the psycho-mental and oral aspects associated with COVID-19 disease. This selection of articles provides a solid base of scientific evidence to support the research findings and conclusions.

In summary, a specific search strategy was implemented in the PubMed, Google Scholar and Scielo databases, using a combination of key terms and subject headings (Mesh) to obtain relevant articles on the psycho-mental and oral aspects associated with the COVID-19 disease. This strategy allowed an effective search and a broad collection of relevant scientific literature.

### 3. Results and Discussion



**Figure 1** Flowchart of the present review

**Table 1: Main results of the review**

| Authors | Year of publication | Findings                                                            |
|---------|---------------------|---------------------------------------------------------------------|
| César   | 2021                | The stress and anxiety associated with the pandemic can lead to the |

|                                                                                              |      |                                                                                                                                                         |
|----------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Augusto Padilla Avalos, Consuelo Marroquín Soto (4)                                          |      | development of oral diseases such as: lesions in the oral mucosa, temporomandibular disorder, bruxism and periodontal disease.                          |
| Michelle Moron Araújo (5)                                                                    | 2021 | COVID-19 has been developing problems of great consequence affecting general health, including mental and oral health.                                  |
| María Eugenia Nemeth Kohanszky, Carolina Paz Matus Abásolo, Rolando Rafael Carrasco Soto (6) | 2020 | The presence of oral ulcers could mean a coronavirus infection or in turn secondary manifestations to the systemic and mental condition of the patient. |
| Inalef Barrios, Eliza Tafat, Grez Bravo, Claudia Fuentes Palma.                              | 2021 | The COVID-19 pandemic has affected people's quality of life, triggering a deterioration in mental health.                                               |

In the article by Padilla et al. (2021) it is evident that the deterioration of the psycho-emotional state resulting from the pandemic has been related to the presence of oral diseases such as: lesions in the oral mucosa, temporomandibular disorder, bruxism and periodontal disease. Indeed, psychological factors such as stress and anxiety associated with the pandemic can lead to the appearance of mucosal and/or dental conditions with an increased risk of developing, worsening and perpetuating their signs and symptoms.

This COVID-19 pandemic for Morón-Araujo, (2021) has had a great impact on both physical health and the mental health and well-being of societies that have been seriously affected by this crisis. The change of life due to this pandemic has generated consequences not only socioeconomic but also fear of the disease, its contagion and spread, which have had a strong impact on the mental health of the world population.

Bruxism generated by anxiety and stress have been a problem in oral health in this pandemic and has manifested itself as in dental wear and fractures, mobility, conditions in the periodontal ligament among others. Also noting that many dentists have seen in their consultations more broken teeth than normal because of these psychosocial problems generated by the pandemic.

For Nemeth et al. (2020) the impact of COVID-19 on oral health is mainly determined by the patient's immune system, the pharmacotherapy they receive and by the pathogenesis of the virus, however, the most reported intraoral findings in individuals correspond to recurrent oral ulcers that could be an inaugural symptom of the virus, but, As these findings are still recent in the literature, it

is unclear whether they are due to coronavirus infection or if they are secondary manifestations to the patient's systemic and psychological condition.

Barrios et al. (2019), their studies showed a high prevalence of depression 57.9%, anxiety of 15.15% and stress ranging from 5.2 to 90.4% in the general population, psychological disorders maintain a high prevalence and even higher during the COVID-19 pandemic and are closely related to the appearance of immune-based oral lesions, Although there is no current evidence on the increase of these specific lesions, it is expected that their prevalence has also increased during this period.

In addition, it is intended to raise awareness and give way to future research on psychological disorders and oral injuries, since both alterations maintain a high prevalence in the population when a new situation occurs that affects the entire community sustainably.

This literature review highlights the importance of examining in detail the psychophysiological and oral impact derived from the COVID-19 health crisis. The pandemic has had significant effects on the mental health of the population, and a notable increase in psychological disorders, such as anxiety, depression and stress, has been observed. These disorders can have repercussions on people's oral health, which has been studied in reference articles.

Several studies have shown a strong association between psychological disorders and oral and dental manifestations. For example, a direct relationship between anxiety and stress has been observed with the development of bruxism, a disorder characterized by teeth grinding and jaw clenching. Bruxism can lead to tooth wear, tooth sensitivity, temporomandibular joint (TMJ) pain, and sleep disturbances (American, 2020; Seligman, 2018). In addition, it has been shown that depression is associated with an increased risk of periodontal disease and tooth loss. Underlying mechanisms include changes in oral care habits, such as a decrease in oral hygiene, and an increased prevalence of risky behaviors, such as smoking and an unhealthy diet (Kessler, 2010; Li, 2017; Caicedo, 2021).

It is important to note that the relationship between psychological disorders and oral manifestations is bidirectional and complex. On the one hand, psychological disorders can increase the predisposition to develop oral diseases due to the decrease in motivation and ability to maintain good oral hygiene. In addition, stress and anxiety can lead to risky behaviors, such as excessive consumption of unhealthy foods and drinks, smoking, and alcohol consumption, which have a negative impact on oral health (Peruzzo, 2007; Pinto, 2020). On the other hand, oral manifestations can aggravate psychological disorders by causing pain, physical discomfort and alterations in aesthetic appearance. These effects can affect people's self-esteem and mental health, generating a vicious cycle that aggravates both psychological disorders and oral conditions (Slade, 2015; Bernabe, 2017).

In this context, dental health professionals play a crucial role in the comprehensive approach to patients during the COVID-19 crisis. In addition to providing appropriate dental treatments, they must consider patients' mental health and provide psychological support. This involves educating patients about the importance of maintaining good oral health, even in situations of stress and anxiety, and providing strategies for the management of associated psychological disorders, such as referral to mental health specialists and the use of relaxation and stress management techniques. Likewise, an interdisciplinary collaboration between dental health professionals and mental health specialists is suggested to effectively address the needs of patients, thus improving the quality of life and integral well-being of people affected by the COVID-19 health crisis.

The present review highlights the relevance of future research in this field to better understand the underlying mechanisms of the relationship between psychological disorders and oral manifestations, as well as to develop more effective prevention and management approaches. The implementation of oral health and mental health promotion programs, together with comprehensive care by health professionals, can contribute to mitigating the negative impact on oral health and psychological well-being of the population affected by the COVID-19 crisis.

#### **4. Conclusion**

The oral manifestations product of contracting or not the disease of SARS-CoV-2, is a topic of current interest so its relationship is still being studied since the spread of contagion is still latent and new characteristics will continue to appear, but something we are sure of is that social isolation, the



concern generated by the state of health and more factors have repercussions on the mental state of people generating behaviors that before the pandemic did not present it. That is, the main cause for oral manifestations to appear or not will depend on the degree of mental involvement of the person participating in the isolation by Covid-19 and the survival situations during this time, regardless of whether it was a positive or negative case of the disease.

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