



## Dental implants: major considerations in the COVID-19 pandemic

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### Abstract

**Introduction:** The COVID-19 pandemic is a global health crisis and the dissemination of COVID-19 has presented significant challenges for dentistry. The risk of nosocomial transmission meant that routine dental care was temporarily suspended in several countries. In this sense, several measures have been proposed by national and international guidelines to minimize the risk of infection. Thus, dental care during the pandemic is challenging due to the high risk of infection.

**Objective:** The present study performed a concise systematic review of dental implants in the context of the COVID-19 pandemic, to highlight the main challenges and guideline-based safety strategies.

**Methods:** This was followed by a systematic literature review model, according to the PRISMA rules. The research was carried out from July 2021 to October 2021 and developed based on Google Scholar, Scopus, PubMed, Scielo, and Cochrane Library. The quality of the studies was based on the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument. **Results and Conclusion:** After the selectivity of articles and literary findings, 127 studies were analyzed, with only 15 medium and high-quality studies selected, according to GRADE rules, and with risks of bias that do not compromise scientific development, based on the Cochrane instrument. To help protect patients from acquiring COVID-19 from a dental office nosocomial infection, many state or local governments have classified dental treatments as non-essential. Dentists were instructed to perform only procedures designated as emergencies. In this sense, dentistry is making great strides in improving oral health through the prevention of dental diseases, especially during the COVID-19 pandemic. The detected

relationship between the stage of dental damage and the severity and prognosis of viral disease was considered significant.

**Keywords:** Dental implants. Implants. Dental care. Pandemic. COVID-19. Guidelines.

### Introduction

The COVID-19 pandemic is a global health crisis and the dissemination of COVID-19 has presented significant challenges for dentistry. Articles published by dental journals explored issues such as the management of clinical practices during the outbreak, infection control in the dental environment, signs, and symptoms of COVID-19 affecting the oral cavity [1].

In this context, more than 5 million dental implants are placed annually in the United States, however, this number has decreased due to the COVID-19 pandemic [2]. The risk of nosocomial transmission meant that routine dental care was temporarily suspended in several countries. In this sense, several measures have been proposed by national and international guidelines to minimize the risk of infection. Another approach to collecting evidence was to carry out expert surveys, which allow for fast, high-quality data collection. Given the urgent need for credible recommendations, research gaps could be filled by asking the opinion of international frontline experts [3].

Also, dental care during the pandemic is challenging due to the high risk of infection. In this regard, certain dental appointments cannot be postponed, only eligible precautions must be implemented quickly to ensure safety. To date, there are few controlled clinical trials of COVID-19 in dentistry. Furthermore, the transmission risk for non-aerosol procedures in dental offices was

considered low or neutral by approximately 55% of specialists, while for aerosol-generating procedures, the vast majority (93%) agreed that the risk was high [4].

In this scenario of infections and the COVID-19 pandemic, there are huge concerns in dental implant procedures, which need to be performed for several reasons, mainly to improve the quality of life of patients. In this sense, the lack of bone in the alveolar crest represents a major problem in aesthetic recovery in patients who have suffered from dentoalveolar traumas, traumatic extractions, pathologies of congenital tooth absence involving the maxilla and mandible, and the possibility of deformity [5]. In this context, tooth loss negatively affects the quality of life, compromising aesthetic functions, chewing, and speech [6-10].

Therefore, the present study performed a concise systematic review of dental implants in the context of the COVID-19 pandemic, to highlight the main challenges and guideline-based safety strategies.

## Methods

### Study Design

This was followed by a systematic literature review model, according to the PRISMA rules (Available in: <http://www.prisma-statement.org/>).

### Data sources and research strategy

The search strategies for this review were based on the descriptors: "Dental Implant. Implant. Dental care. Pandemic. COVID-19. Guidelines". The research was carried out from July 2021 to October 2021 and developed based on Google Scholar, Scopus, PubMed, Scielo, and Cochrane Library. Also, a combination of the keywords with the Booleans "OR", "AND", and the operator "NOT" were used to target the scientific articles of interest.

### Study quality and risk of bias

The quality of the studies was based on the GRADE instrument, with guidelines, randomized controlled clinical studies, prospective controlled clinical studies, and studies of systematic review and meta-analysis listed as the studies with the greatest scientific evidence. The risk of bias was analyzed according to the Cochrane instrument.

## Results and Discussion

After the selectivity of articles and literary findings through the following descriptors dental implant, implant, dental care, pandemic, COVID-19, and

guidelines, 127 studies were analyzed, with only 15 medium and high-quality studies selected, according to GRADE rules, and with risks of bias that do not compromise scientific development, based on the Cochrane instrument (**Figure 1**).

After analyzing the main studies and guidelines on the safety of dental procedures in the COVID-19 pandemic, it was found that to help protect patients from acquiring COVID-19 from a dental office nosocomial infection, many state or local governments have classified dental treatments as non-essential. Dentists were instructed to perform only procedures designated as emergencies. In this sense, dentistry is making great strides in improving oral health through the prevention of dental emergencies [1,2].

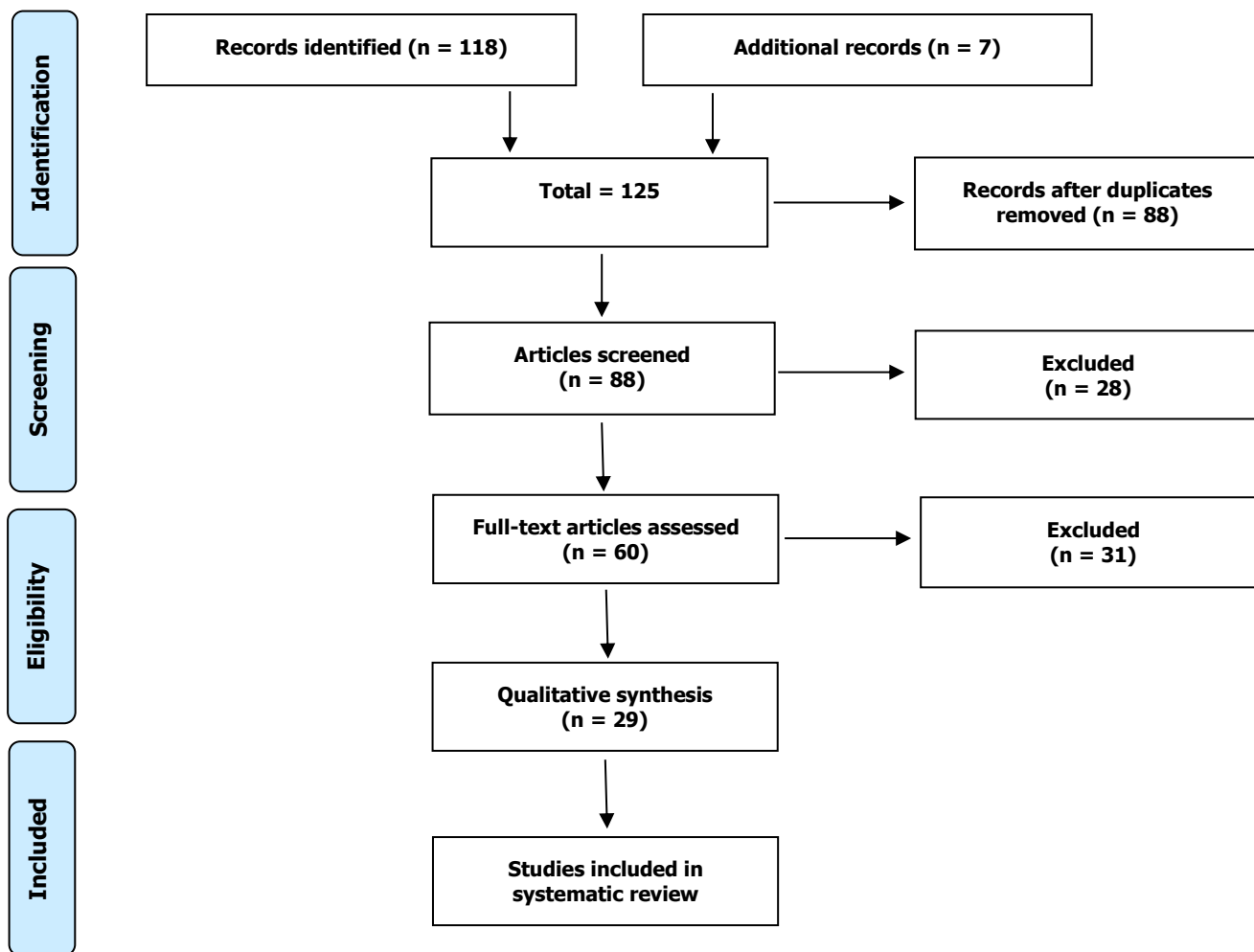
In this regard, one study reported consensus statements based on two analyzes that summarize European guidelines and expert opinion on the control and prevention of infections in dentistry during the pandemic. The dynamics of the pandemic had an impact on rapidly published and frequently updated national guidelines in Europe. As the guidelines were not based on solid evidence, they were supplemented by expert opinion. Dental care must be guaranteed during the pandemic, except with confirmation of COVID-19. Proper infection control protocols should be strictly followed [11].

Furthermore, a study revealed the relationship between the Stage of Dental Damage (DD Stg) and the severity of the disease COVID-19. The study included 137 patients (20-65 years) based on oral examination records and panoramic radiographs of 1,516 COVID-19 patients diagnosed using real-time PCR testing. Thus, patients on DD Stg 3 had significantly higher age and mortality. The values of chronic disease, number of dental caries and hospitalization for COVID-19 were higher in DD Stg 2 and 3 than in DD Stg 0 and 1. Hospitalization for COVID-19 was higher in DD Stg 3 than in DD Stg 2. Missing teeth were larger in DD Stg 3 than in other stages. Symptoms associated with COVID-19 were significantly lower in DD Stg 0 than in DD Stg 1, 2, and 3. Therefore, the detected relationship between the DD stage and the severity and prognosis of viral diseases, such as COVID-19, was considered significant [12].

In this regard, the American Academy of Implant Dentistry (AAID) discusses how COVID-19 impacts dental care, presents guidelines for dentistry in general and treatments related to dental implants. Thus, the AAID points to the issues listed in **Table 1** [13].

Furthermore, European guidelines and expert opinion showed on the control and prevention of infections in dentistry during the pandemic. The

Figure 1. Flow chart.



dynamics of the pandemic had an impact on rapidly published and frequently updated national guidelines in Europe. As the guidelines were not based on solid evidence, they were supplemented by expert opinion on the control and prevention of infections in dentistry. Dental care must be guaranteed during the pandemic, but in case of suspicion or confirmation of COVID-19 disease, treatment should be postponed, if possible [11].

**Table 1.** Issues about dental care in the COVID-19 pandemic [13].

What constitutes a dental implant-related emergency?
How should patients be screened and screened?
What personal protective equipment is needed?
How should operators be equipped?
What equipment should be used?
What, when, and how can procedures be performed?

Also, remote screening and patient-related measures were recommended as the most effective in reducing the transmission of SARS-CoV-2. The type of personal protective equipment provided by the dental

team must be appropriate for the procedure and the risk of infection. It is important to continuously update dental guidelines, considering the evolution of the pandemic and new scientific evidence available. Thus, a study evaluated the opinion of European experts on the control and prevention of infections in dentistry during the second wave of the pandemic. A total of 26 experts participated in the survey. The overall risk of transmission in dental settings was scored lower compared to the initial survey, although the risk associated with aerosol-generating procedures (AGP) was still high. The use of PPE was less frequently recommended for non-AGP, while most experts still recommended FFP2/ FFP3 masks (80.8%), face shields or goggles (88.5%), lab coats (61.5 %), and caps (57.7%) for AGP. Most specialists also considered the mouthwash to be relevant (73.1%) and reported using it before treatment (76.9%). No uniform opinion was found regarding the relevance of the COVID-19 test for staff and patients [14].

Besides, a study gathered experiences and recommendations from frontline clinical experts on critical aspects of providing dental care during the

pandemic. The risk of SARS-CoV-2 transmission in dental settings for aerosol-generating procedures was considered high. For non-aerosol procedures and aerosol generators, more than 80% of experts recommended face shields and caps for each treatment. For aerosol generation procedures, additional measures (FFP2/FFP3 masks and aprons) were suggested by the vast majority of experts. Therefore, limiting aerosol-generating procedures together with the use of adequate personal protective equipment was considered crucial to protect dental health professionals and patients [15].

## Conclusion

Dentistry is making great strides in improving oral health through the prevention of dental diseases, especially during the COVID-19 pandemic. The detected relationship between the stage of dental damage and the severity and prognosis of viral disease was considered significant.

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## Data sharing statement

No additional data are available.

## Conflict of interest

The authors declare no conflict of interest.

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