Journal of Medical and oral biosciences
ISSN (Online): 3007-9551
ISSN (Print): 3007-9543

JMOB
Open Access DOAJ

IRAQI Academic Scientific Journals
Type: Research article
Publish online: 08 / 05/ 2025

The Effect of COVID -19 On Oral Cavity

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OPEN ACCESS

ARTICLE INFO
Received: 17/11/24
Revised: 20 / 01/ 2025
Accepted: 04/ 05 / 2025
Publish online: 08/ 05/ 2025

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CITATION

Marwah M. Adnan, Fudhla S. Al- Zubaydi. (2025). The Effect of Covid -19 On Oral Cavity. JMOB. 2;(2): 01-08.

https://doi.org/10.58564/jmob.93

Abstract

Viral infection can reduce the body's immunity during life, especially after COVID-19. This led to multiple health issues, resulting in a secondary infection, and may be considered a threatening disease to human beings; this disease led to changes in the nutrition habits of the patient and affected the type of healthy food used to eat. As a result, several dental problems ranged from simple to severe associated with the previous dental health of the patient before the COVID-19 infections. This study aims to determine the effect of COVID-19 on oral health in general and to recognize which of the oral tissues and structures get more damage by the viral infection. This study was done in the Iraqi Dental Health Center for Training and Dental Services using patient records between January and July 2021. Patients with oral and dental health records and a history of COVID-19 were included in the study. Those without oral and dental health records were excluded from the study. The study showed that the COVID-19 patients need dental treatment and mostly have severe intervention and treatment. Moreover, a strong relationship between oral health and general health was found, accompanied by an effect on the immune system that fights any virus or microbial infection. In conclusion, the results of the current study showed a debilitated immune system in COVID-19 patients. It significantly influenced dental and oral health and necessitated intensive dental treatment to maintain their health during the virus infection.

Keywords: Dental Health, COVID-19, Dental Treatment, Oral cavity, Filling.

Introduction

In 2019, the world faced a deadly threat from a new virus, which first appeared in Wuhan, China, and then spread rapidly all over the world, causing a lot of life loss and also leading to severe damage to public health. The population suffered from two serious challenges during the COVID-19 pandemic. First was how to deal with infected people and save their lives because those people were suffering from several problems such as difficulty breathing, eating, drinking, and loss of taste, and facing many psychological problems, especially during the period of lockdown to control viral spreading. Secondly, how to deal with oral health and teeth problems, especially in the treatment of emergency tooth condition (1–3) . The viral infection plays an important role in reducing the immune system of COVID-19 patients, lead to several health problems such as a secondary infection. COVID-19 is a life-threatening disease that disturbs the population's lifestyle,

like nutrition habits, traveling, working, and learning modules. Dental clinics were highly affected by the period of pandemic lockdown. This led to many dental problems ranging from simple to severe, according to the patient's dental health before the COVID-19 infection (4,5). Previous studies determined a strong relationship between individuals' general health, oral health, and the efficiency of their immune system in fighting any viral or microbial infection (5,6). There are many parameters used to evaluate the oral and dental health status. Moreover, applying these parameters will supply dentists with important data to combat diseases and understand oral health status during viral and bacterial diseases (7–9).

A review of the literature regarding the effect of COVID-19 on the oral cavity revealed scarce publications worldwide, especially in Iraq. Therefore, this study is designed to determine the effect of COVID-19 on oral health in general and recognize the most affected oral health and damaged structures/ tissues by SARS-CoV-2 infection.

Materials and methods

The patients of this study were selected according to simple random, non-biased sampling technique. Moreover, this method ensures that each person in the target population has the same possibility of being included in the sampling. Consequently, the selected samples displayed the population and revealed more precise results. Patients diagnosed with COVID-19 with oral and dental health records were included in this study. The exclusion criteria were patients without oral and dental records. The study was done in the Al-Iraqi dental teaching clinic from January to July 2021. The study examined 155 patients, most of them recorded positive PCR COVID-19. The total patients were 199 aged 20-65 years, comprising 75 males and 124 females. However, only 149 patients who contracted COVID-19 were referred to the teaching dental clinic outpatient for dental examination, treatment, and control.

Additionally, each patient filled out a questionnaire form including the following questions (Table.1).

Table.1: Shows the criteria of a questionnaire form

No	Criteria	Yes or No
1.	Infected with COVID-19.	
2.	Scaling and polishing	
3.	Taste loss	
4.	Ulceration in mouth	
5.	Simple filling	
6.	Endodontic treatment	
7.	Crown and bridge	
8.	Extraction	
9.	No need any treatment	
10.	Need two or more treatment	

Results

This study investigated 155 patients most of them with positive PCR COVID-19 records. A total of 199 patients aged 20–65 years. According to the gender the patients were comprised 75, and 124 for males, females respectively (Table.2). Additionally, only 149 patients were infected with covid-19 (Table.3) and admitted to dental outpatient clinic

for dental examination, treatment or control in the last 6 months and have complete oral examination records. As a result, the survey showed most COVID-19 patients needed the dental treatment with more than one dental problem.

Table.2: Shows the total number of patients and the number and percentages of male and female that included in the current study

Gender	Frequency	Percent	P-value¥
Male	75	37.7	0.001**
Female	124	62.3	
Total	199	100	

Table. 3: Shows the history of COVID-19 infection

Have previously covid-19 infection	Frequency	Percent	P-value¥
Yes	149	74.9	0.001**
No	50	25.1	
Total	199	100.0	

There is significant difference in the number of people who infected with covid_19 and those who are not infected

The result of the study showed only 74.9 % of patients need to visit the dental clinical for treatment and care after healing from COVID-19 infection (Figure.1).

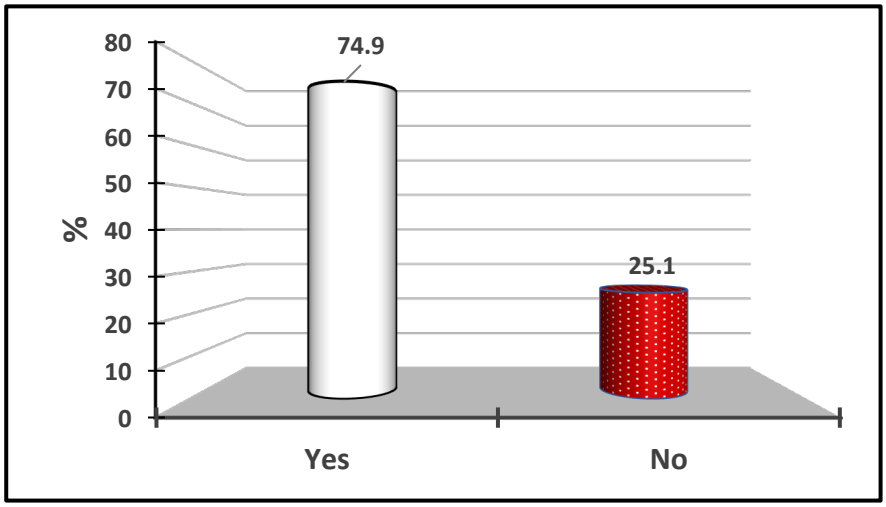


Figure. 1: Shows the number of previously infected and non-infected patients with COVID-19

According to treatment plan, the results of the current study showed variations in the percentages of treatment including 8.0%, 3.0% ,0.5%, 12.1%, 17.6%, 4.5%, 7.0%, 40.7 %, and 6.5 for scaling and polishing, Taste loss, Ulceration in mouth, simple filling, endodontic treatment, Crown and bridge, extraction of teeth, no need any treatment, and two or more treatments respectively (Table. 4, Figure.2).

Table 4: Shows the type and the frequency of the treatment module

Treatment	Frequency	Percentage
scaling and polishing	16	8.0
Taste loss	6	3.0
Ulceration in mouth	1	0.5
simple filling	24	12.1
endodontic treatment	35	17.6
Crown and bridge	9	4.5
extraction of teeth	14	7.0
no need any treatment	81	40.7
Two or more treatments	13	6.5
Total	**199**	**100**
Chi square test	**0.001****	

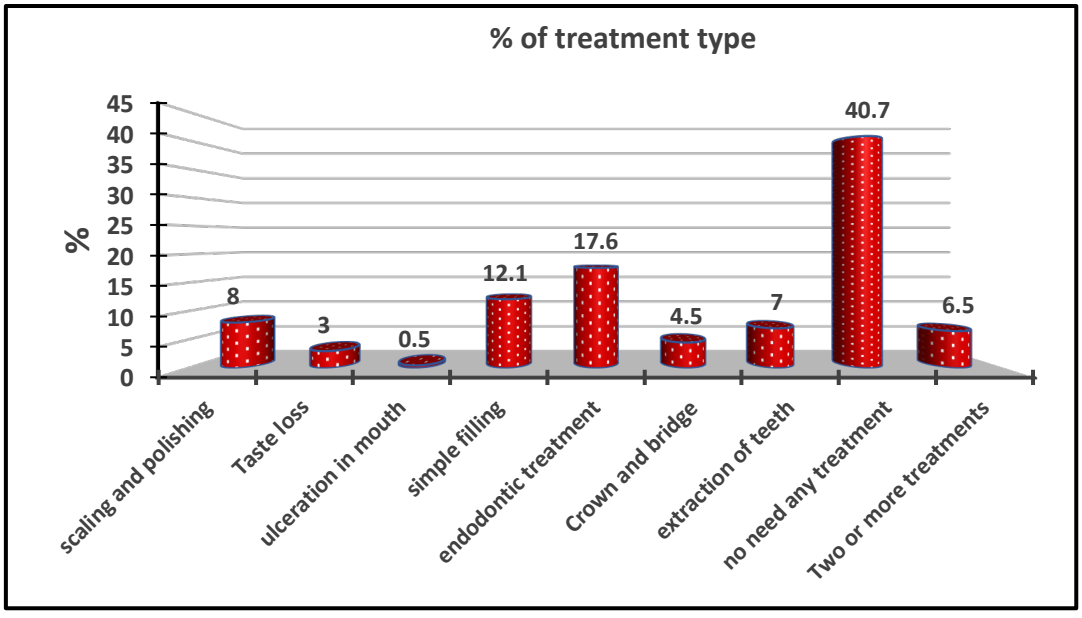
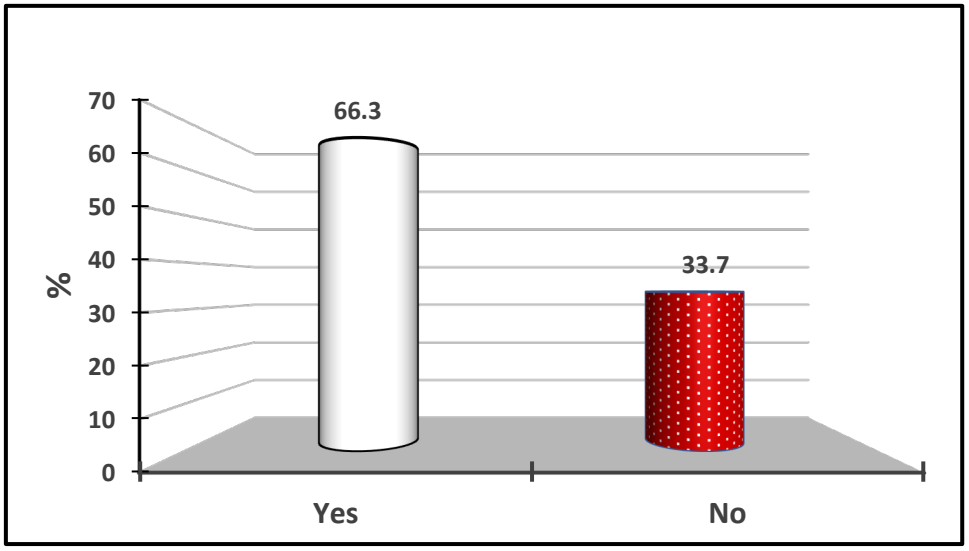


Figure.2: Shows the category of patients according to the treatment module

The results of the current study showed that 66.3 believed that loss of taste lead to reduce the rate of tooth brushing and thus lead to increase the dentist visit (Figure. 3).



Discussion

COVID-19 is a novel pandemic disease caused by SARS-Cov-2; it has significantly impacted the health population worldwide, comprising dental care amenities. Earlier and at the pandemic's peak, most dental clinics were on lockdown or restricted to only emergency cases (12–10) . Although lockdown measurements were necessary to control viral infection, they prevented routine dental checkups and treatment, besides elevating the challenge of untreated dental cases like periodontal disease and oral infection(10) .
Most patients with dental issues suffer from worsening oral health due to limited admission to professional dental clinics fear of COVID-19 infection, leading to altering of the regime and oral hygiene behaviors throughout the isolation period, such as requesting topical anesthesia to kill toothache and avoiding dentist treatment (13)
Dental caries and periodontal diseases are the most common chronic diseases caused by bacterial colonization (Biofilm) on the tooth surfaces leading to tooth loss (14). In Iraq and during the COVID-19 pandemic, like other governmental services, the majority of dental clinics were closed for several reasons, such as a lack of knowledge about how to deal with the infected patients and the fear of population and dentists from high infectivity of the virus. Later on, and after implementing the vaccination program, other methods to reduce the spread and transmission of the infection include sterile instruments in the dental units and a suitable way to protect the dentist himself against the infection (15) Consequently, the patients neglected to visit the dental centers, leading to increased dental and periodontal problems.(8,14,16)

In this study, 199 patients participated in this survey, and only 149 of them had been previously infected with COVID-19, representing 74.9% of the patients who took part in the study with different signs and symptoms of the disease and recovered after the infection. Those patients needed to visit the dental clinic for a checkup on oral hygiene condition and to evaluate the effect of the infection on the oral and dental tissue (17) .The current study found that 40.7% of the patients did not need any dental intervention or treatment. This result displayed that that patient improved their oral hygiene during the period of the viral infection and followed the instructions of the health center to reduce the risk of the infection and the morbidity rate, especially in the oral cavity, which is one

of the viral infection routes (4,18) . However, 17.6 % of the patients showed endodontic treatment. In comparison, only 12.1% needed a simple filling, and 8% needed scaling and polishing, while 0.5% suffered from ulceration in the mouth, which agrees with previous observations (19) .The loss of taste is one of the clear signs and symptoms of COVID-19 (20), and the results of the current study showed whether this symptom affects the patient's desire for brushing. It showed 66.3 % of patients thought that might affect and lead to reduced tooth brushing, which unfortunately leads to increased oral health problems and, consequently, increased visits to dental centers (20,21).

Conclusions

In conclusion, within this study's limitations, the current study's results showed the impact of COVID-19 on patient's oral health. The pandemic significantly influenced dental and oral health and the necessity for intensive dental treatment to maintain their health during the virus infection; it also highlights its impact on the immune system's ability to combat viruses and microbial infections.

Declarations

Acknowledgment

The Authors would like to acknowledge Al-Iraqia university/ College of dentistry for their helpful discussion, technical assistant and creating supportive and collaborative research environment.

Funding

None

Competing interest statement

None

Ethics statement

The authors declare that the author approved that this research follows the journal's Attach Ethic Approval guidelines as appeared on the journal's author guidelines page.

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