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# Impact of Covid-19 on the incidence and severity of odontogenic infections in Fiji islands: a multicenter hospital-based retrospective study

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## Abstract

**Background** Severe odontogenic infections (OIs), often associated with untreated dental caries, can lead to life-threatening complications. In Fiji, dental caries is highly prevalent, and during the COVID-19 pandemic, limited access to dental care may contributed to the progression of untreated lesions, potentially resulting in an increased number of severe OI cases. However, there is a lack of evidence from Fiji on this issue. Therefore, this study aimed to assess the impact of the COVID-19 pandemic on the presentation of patients with OIs.

**Methods** A retrospective, multicenter hospital-based study was conducted in Fiji, involving 260 participants who presented with odontogenic infections (OIs) during two time periods: pre-COVID-19 (March 2019 to February 2020) and during COVID-19 (March 2020 to February 2021). Collected variables included patient demographics, clinical presentation, etiological factors, and admission status. Data were analyzed using SPSS, with descriptive statistics and association tests conducted at a significance level of 0.05.

**Results** No statistically significant difference in the overall number of patients presenting with OIs was observed during the COVID-19 period. A higher proportion of cases occurred in patients under 30 years of age (62.8%), among the i-Taukei ethnic group (69.2%), and those residing in urban areas (48.1%), with a nearly equal distribution between males and females. The majority of cases were managed as outpatients (60.4%). Most infections involved a single fascial space and presented with a single clinical sign or symptom (76.9%). Dental caries was identified as the most common cause of infection (90.4%). While CWM Hospital and Lautoka Hospital reported a reduction in patient numbers (9.7% and 25%, respectively), Labasa Hospital recorded a significant increase in cases (34.7%, $p < 0.001$).

**Conclusion** There was no evidence of a change in the prevalence, admission rates, or severity of odontogenic infections (OIs) during the COVID-19 pandemic. However, a significant regional variation in patient distribution was observed, with Labasa Hospital experiencing a notable increase in cases, attributed to the absence of lockdown measures and COVID-related restrictions in that region.

**Keywords** Odontogenic infection, Clinical presentation, COVID-19, Pandemic, Impact

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## Background

Odontogenic infections (OIs) are microbial in origin and primarily bacterial, typically arising from infections of the teeth or their supporting structures [1]. These infections commonly result from dental caries or periodontal disease and are generally polymicrobial, comprising anaerobic gram-positive cocci, facultative anaerobic gram-positive cocci, and gram-negative rods [1–3]. OIs most frequently affect individuals between the ages of 21 and 40 [4–9]. The distribution by gender, however, varies across different studies and regions, likely influenced by sample size and population demographics [4–8].

Clinically, OIs may range from mild to severe forms. Common clinical features of spreading OIs include fever, dysphagia, dyspnea, trismus, floor of mouth oedema, reduced tongue mobility, and swelling in areas such as the buccal, submandibular, sublingual, submental, masseteric, and peri-pharyngeal spaces [6, 10–13]. If left untreated, OIs can spread rapidly beyond the tooth and cortical bone into adjacent fascial and deep neck spaces. This progression can result in severe, potentially life-threatening complications, including deep neck infections, airway obstruction, septic shock, multiorgan failure, and death [1, 14–16]. These serious outcomes underscore the importance of viewing OIs as a significant public health concern. An increase in such cases could place considerable strain on Fiji's already resource-limited healthcare system, particularly by increasing demand for hospital beds and intensive care resources—needs that are further exacerbated during periods of crisis such as the COVID-19 pandemic.

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, is primarily transmitted via respiratory droplets and aerosols generated during activities such as talking, coughing, sneezing, or breathing [17]. Fiji reported its first confirmed case on March 19, 2020. In response, the country implemented strict preventive measures, including international border closures, lockdowns, contact tracing, and restrictions on gatherings and non-essential services [18, 19]. These strategies were effective in preventing community transmission during the initial phase of the pandemic. However, these necessary public health interventions had unintended consequences. Lockdowns, movement restrictions, fear of infection, financial constraints, and reduced availability of routine healthcare services created significant barriers to accessing timely medical and dental care. These disruptions affected the progression and management of several health conditions, including OIs.

International studies have documented varying impacts of the pandemic on OI-related hospital admissions. A retrospective multicenter study in France reported a significant nationwide decrease of 44% in admissions for cellulitis during the pandemic compared to the previous year [20]. The authors hypothesized several potential explanations for this decline, including organizational factors promoting early outpatient management, patients avoiding medical care due to fear of infection, a usual overestimation of surgical indications, and a concurrent reduction in the use of non-steroidal anti-inflammatory drugs [20]. Similarly, a study in England reported fewer admissions for cervicofacial infections of dental origin in 2020 relative to the prior year. This reduction was attributed to government campaigns urging people to stay home, alongside the establishment of Urgent Dental Care Centers to manage cases outside of hospital settings [21, 22].

Conversely, other research has shown an increase in severe OI presentations during the pandemic. Studies have reported a marked increase in admissions for deep neck space infections during the COVID-19 pandemic, with rises ranging from 35% to 80% [23, 24]. These increases were likely driven by delayed care-seeking behavior, financial hardship, loss of dental insurance, clinic closures, fear of contracting COVID-19, and public confusion about quarantine guidelines [23, 24].

These divergent global findings suggest that the pandemic's impact on OIs is heavily influenced by local healthcare systems, policies, and public responses. This highlights the need for region-specific studies to understand the true burden and outcomes associated with OIs during health emergencies.

In the context of Fiji, COVID-19-related policies—including lockdowns, travel restrictions, economic disruptions, and limited healthcare access—may have significantly affected patterns of healthcare utilization [25]. Delays in receiving early, non-invasive dental care may have resulted in more advanced infections requiring hospitalization and intensive treatment, thereby increasing the load on an already strained healthcare system [16].

Despite the relevance of this issue, no studies to date have examined the impact of the COVID-19 pandemic on odontogenic infections in Fiji or in the broader Pacific Island Countries and Territories (PICTs). Given the limited healthcare infrastructure in the region, understanding how the pandemic influenced OI presentation and severity is critical for future public health preparedness and resource planning. This study aimed to assess the impact of the COVID-19 pandemic on the prevalence and clinical presentation of odontogenic infections in Fiji. It was hypothesized that while fewer patients may have presented with OIs due to restricted access and fear of COVID-19, those who did seek care were more likely to present with severe infections, owing to delays in treatment.

## Methods

### Study design and setting

This study employed a retrospective quantitative design using secondary data obtained from patient medical records at the three tertiary hospitals in Fiji (Fig. 1): Colonial War Memorial Hospital (CWMH) in Suva (Central Division), Lautoka Hospital (Western Division), and Labasa Hospital (Northern Division). These are the only tertiary hospitals serving their respective regions and are under the administration of the Ministry of Health and Medical Services (MoHMS), Fiji's primary healthcare provider. The national healthcare system operates across four divisions and 21 subdivisions, including Rotuma [26].

Fiji is an island nation in the South Pacific with a projected population of 900,869 by 2025. The population is ethnically diverse, comprising i-Taukei (indigenous Fijians), Fijians of Indian Descent (FID), Chinese, Europeans, other Pacific Islanders, Rotumans, and others [27, 28].

All three tertiary hospitals were included to ensure national representation, enabling more comprehensive data collection and broader applicability of results to the Fijian context.

### Study sample

A non-probability purposive sampling approach was used to extract data from the hospital dental registries which focused on specific criteria, targeting individuals with specific experience. It has the advantage of being efficient, targeted and flexible but has potential for bias and limited generalizability. All patients who met the inclusion criteria during the study period were included. Data were collected from the Patient Information System (PATIS) and physical medical records for two timeframes: the pre-COVID-19 period (March 2019 to February 2020) and the first wave of the COVID-19 pandemic (March 2020 to February 2021).

The initial sample comprised 347 patients. However, 63 records were excluded due to missing or unavailable medical files. Upon further review, an additional 24

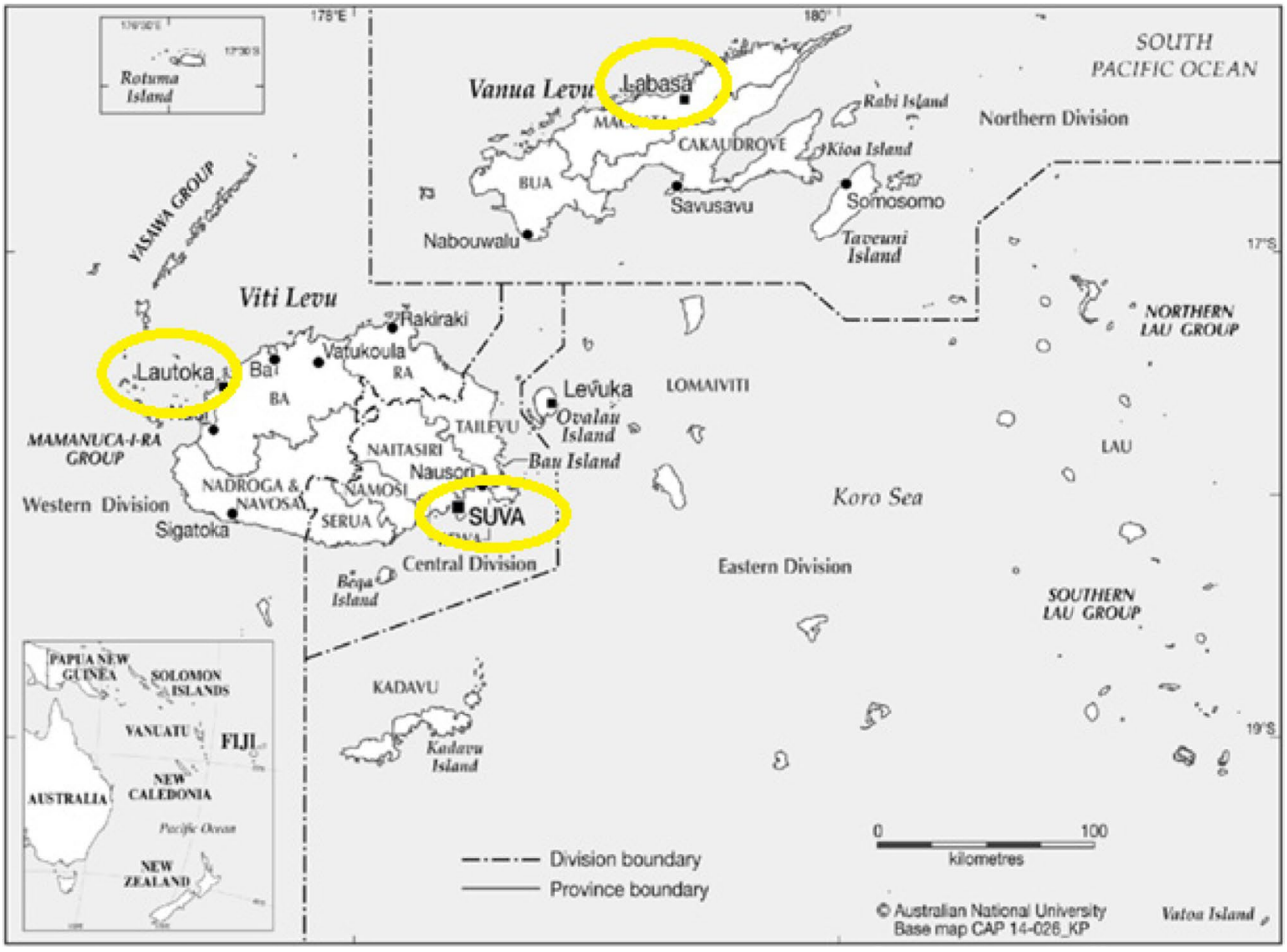


**Fig. 1** Map of Fiji with division and subdivision (province) boundaries with permission from Maps Online, CartoGIS Services, ANU College of Asia and the Pacific, The Australian National University [29].

records were excluded due to incomplete clinical information. Thus, the final sample size used for data analysis was 260 participants who presented with odontogenic infections (OIs) during the two-year study period. (Fig. 2)

### Data collection procedure

Data was manually extracted from the Oral Surgery registries of the three hospitals by the principal investigator. Cases meeting the inclusion criteria were identified and compiled into a patient list. Individual medical records were then retrieved and reviewed. Records with incomplete demographic or clinical data were excluded.

Data were extracted using a standardized Excel-based data collection tool and included information on patient demographics, clinical presentation, etiological factors, and admission status. A data dictionary was developed to maintain consistency in variable definitions and coding.

### Study variables

Patients of all ages, sexes, and ethnic backgrounds were included in the study if they had a diagnosis of one or more of the following conditions, as documented in clinician notes: odontogenic infections (OIs), dental infections, or facial/maxillofacial cellulitis or infections secondary to dental causes. OIs are infections originating from dental structures that extend beyond the alveolus and may spread into fascial spaces [30]. In this study, OIs included vestibular abscesses, spreading facial cellulitis or abscesses, and deep neck infections. Patients were excluded if their medical records lacked complete patient or clinical information or if their diagnoses did not fall within the specified criteria of the study.

The independent variables included patient demographic information: (1) Age, categorized into the groups ≤ 5, 6–14, 15–29, 30–54, and 55 + years; (2) Gender, recorded as male or female according to hospital records; (3) Ethnicity, classified into i-Taukei (indigenous population), Fijians of Indian Descent (FID), and others; and (4) Location, categorized as urban, peri-urban, or rural. (Urban areas are defined by high population density and significant infrastructure development, peri-urban areas as transitional zones undergoing urban expansion, and rural areas by sparse population and agricultural-based livelihoods, located in remote or hard-to-reach regions).

The dependent variables examined were: (1) Clinical presentation at the time of hospital visit, including clinical signs and symptoms as well as the fascial spaces involved which were based on clinical notes; (2) Etiological factors of the odontogenic infection (OI), such as the causative tooth and the underlying pathology (e.g., dental caries or periodontal disease); and (3) Admission status, indicating whether the patient was managed as an outpatient or admitted as an inpatient. Data was recorded in an Excel spreadsheet.

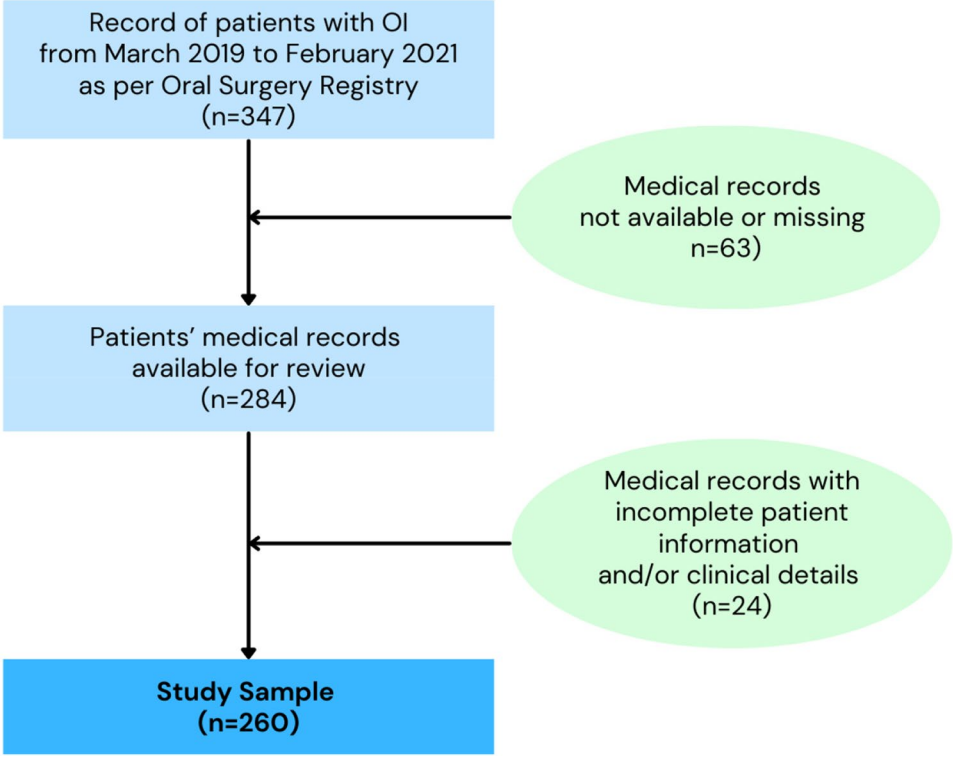


**Fig. 2** Patient recruitment flow chart

**Table 1** Characteristics of patients ($n=260$) pre-COVID-19 and during the COVID-19 pandemic

| Characteristics of Patients | Pre-COVID-19 (March 2019 to Feb 2020) *n* (%) | During COVID-19 (March 2020 to Feb 2021) *n* (%) | *p* value |
|---|---|---|---|
| Number of patients | 127(48.8) | 133(51.2) | |
| Age (years) | | | 0.766 * |
| ≤ 5 | 24(18.9) | 23(17.3) | |
| 6–14 | 30(23.6) | 25(18.8) | |
| 15–29 | 26(20.5) | 35(26.3) | |
| 30–54 | 35(27.6) | 36(27.1) | |
| 55+ | 12(9.4) | 14(10.5) | |
| Gender | | | 0.750* |
| Male | 72(56.7) | 78(58.6) | |
| Female | 55(43.3) | 55(41.4) | |
| Ethnicity | | | 0.541** |
| I-Taukei | 91(71.7) | 89(66.9) | |
| FID [#] | 33(26.0) | 38(28.6) | |
| Others | 3(2.4) | 6(4.5) | |
| Residential Location | | | 0.475* |
| Urban | 59(46.5) | 66(49.6) | |
| Peri urban | 35(27.6) | 28(21.1) | |
| Rural | 33(26.0) | 39(29.3) | |

*Chi-square **Fischer [#] Fijian by Indian Descent

### Data management and analysis

All collected data were entered into Microsoft Excel and subsequently imported into SPSS (Statistical Package for the Social Sciences), Version 28.0.1.1, for statistical analysis. A custom data extraction tool and accompanying data dictionary were created to standardize variable definitions and maintain consistency.

Descriptive statistics were used to summarize categorical variables in terms of frequencies and percentages. Association tests using the Chi-square and Fisher's exact tests were employed, as appropriate, to compare differences between the pre-COVID-19 and COVID-19 periods. A *p*-value of less than 0.05 was considered statistically significant. Where significant associations were found, such as in Hospital Distribution, Bonferroni correction was applied to minimize the risk of Type I error. Variables that were not statistically significant did not require this adjustment.

## Results

A total of 260 participants were included in this multicenter study. Table 1 presents a comparison of the epidemiological patterns of patients presenting with odontogenic infections (OIs) at tertiary hospitals in Fiji during the pre-COVID-19 period (March 2019 to February 2020) and the COVID-19 pandemic period (March 2020 to February 2021). While there was a slight increase of 2.4% in the number of patients during the pandemic period compared to the pre-pandemic period, this difference was not statistically significant. Furthermore, there were no significant differences between the two time periods in terms of patient age, gender, ethnicity, or residential location.

Figure 3; Table 2 present the distribution of patients with odontogenic infections (OIs) across three tertiary hospitals during the pre-COVID-19 and COVID-19 periods. Both the Colonial War Memorial (CWM) Hospital and Lautoka Hospital reported decreases in OI cases during the pandemic, by 9.7% and 25%, respectively. In contrast, Labasa Hospital recorded a notable increase of 34.7% in OI cases. A chi-square test of independence showed a statistically significant association between hospital and time period ($p<0.001$), which remained below the Bonferroni-adjusted alpha level of 0.017. This confirms that the regional variation in patient distribution was statistically significant.

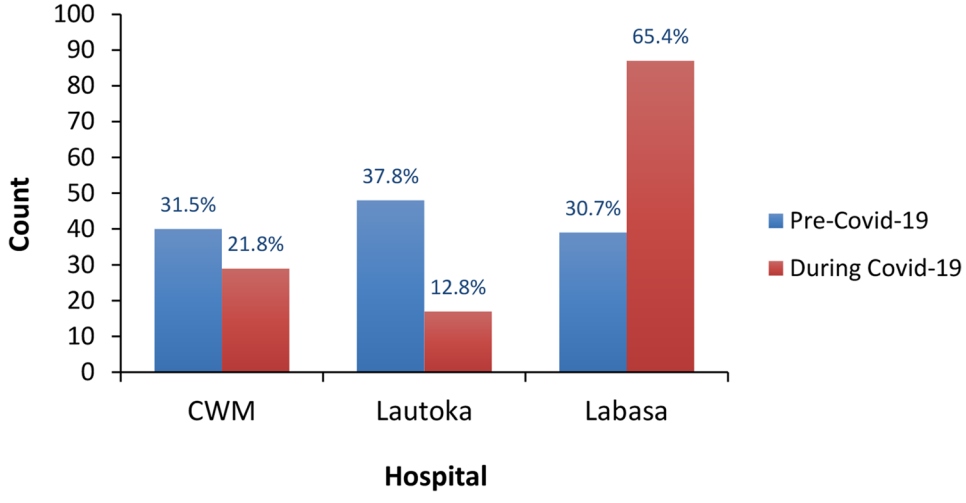


**Fig. 3** Comparison of OI case distribution

**Table 2** Admission status and regional distribution ($n=260$) pre-COVID-19 and during the COVID-19 pandemic

| | Pre Covid-19 *n* (%) | During Covid-19 *n* (%) | *P* value |
|---|---|---|---|
| ***Hospital*** | | | < 0.001* † |
| CWM | 40 (58.0) | 29 (42.0) | |
| Lautoka | 48 (73.8) | 17 (26.2) | |
| Labasa | 39 (31.0) | 87 (69.0) | |
| ***Admission Status*** | | | 0.519* |
| Inpatient | 50 (48.5) | 53 (51.5) | |
| Outpatient | 77 (49.0) | 80 (51.0) | |

*Chi-square †Bonferroni adjustment

Figure 4; Table 2 presents the distribution of patients by admission status during the pre-COVID-19 period and the COVID-19 pandemic. The analysis showed no statistically significant difference ($p=0.519$) in the proportion of patients managed as inpatients or outpatients between the two periods.

The clinical presentations of patients, including the fascial spaces involved and the associated signs and symptoms at the time of presentation, are shown below. Figure 5 presents comparisons of the frequency of fascial space involvement among patients diagnosed with odontogenic

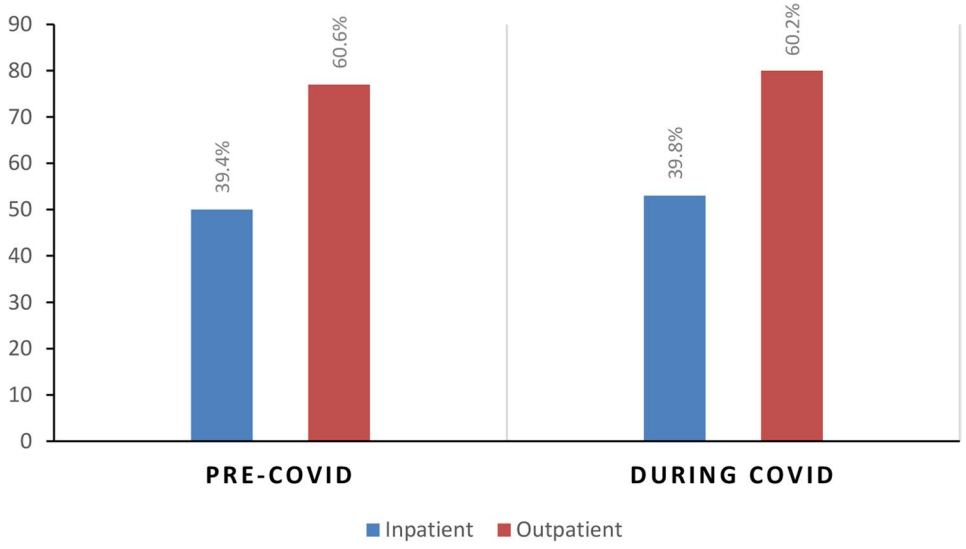


**Fig. 4** Comparison of admission status of patients pre-COVID-19 and during COVID-19

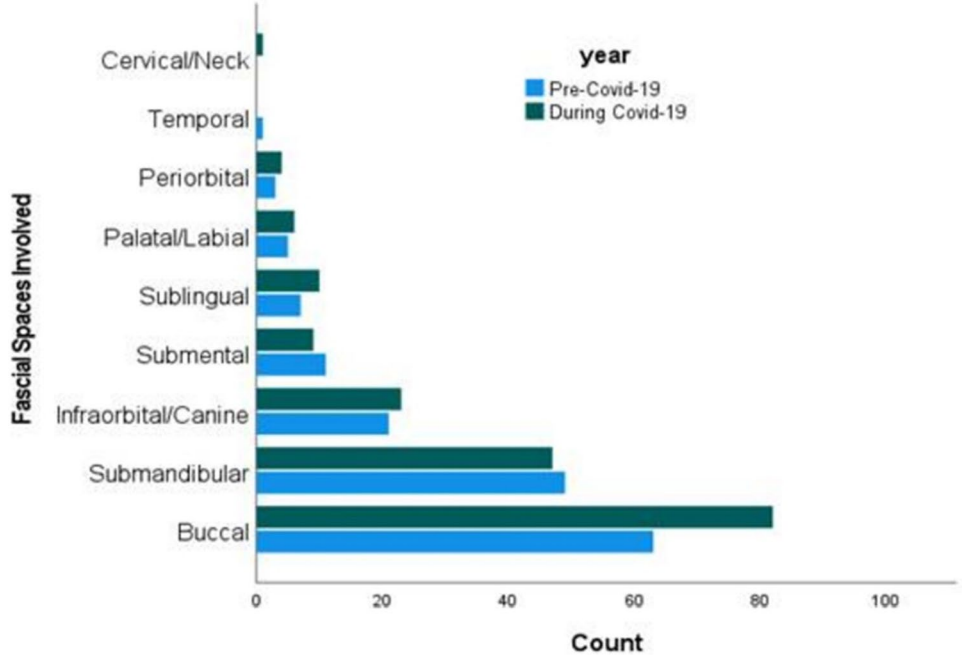


**Fig. 5** Frequency of fascial space involvement of OIs pre-COVID-19 and during COVID-19

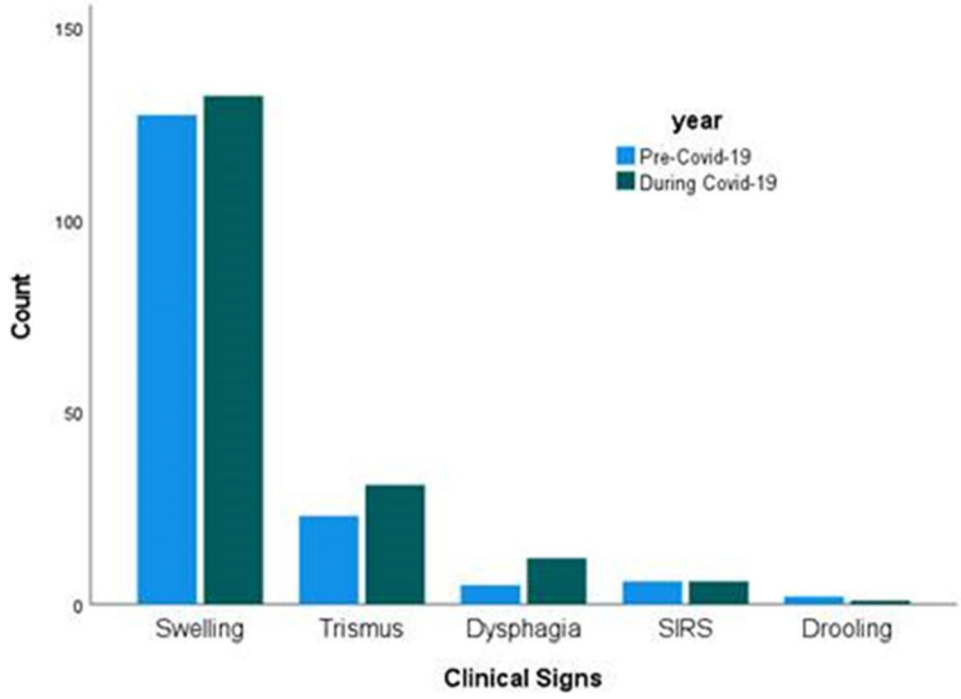


**Fig. 6** Comparison of frequencies of clinical signs of patients with OIs pre-COVID-19 and during COVID-19

**Table 3** Clinical signs and symptoms pre-COVID-19 and during the COVID-19 pandemic

| | Pre Covid-19 | During Covid-19 | *P* value |
|---|---|---|---|
| ***Clinical signs & symptoms*** | | | 0.396* |
| Swelling | 127 | 132 | |
| Trismus | 23 | 31 | |
| Drooling | 2 | 1 | |
| Dysphagia | 5 | 12 | |
| SIRS ‡ | 6 | 6 | |

*Chi-square ‡ Systemic Inflammatory Response Syndrome

**Table 4** Frequency of clinical presentation of OIs in pre-Covid-19 and during the COVID-19 pandemic

| Clinical Presentations | Pre-Covid-19 (March 2019-Feb 2020) *n* (%) | During Covid-19 (March 2020-Feb 2021) *n* (%) | *p* value |
|---|---|---|---|
| *Total number of patients* | 127(48.8) | 133(51.2) | |
| *Number of fascial spaces involved* | | | 0.769* |
| Single | 99(78.0) | 101(75.9) | |
| Multiple | 28(22.0) | 32(24.1) | |
| *Number of clinical signs and symptoms* | | | 0.330* |
| Single | 101(79.5) | 99(74.4) | |
| Multiple | 26(20.5) | 34(25.6) | |

*Chi-square

infections in the pre-COVID-19 and COVID-19 periods. Overall, the majority of fascial spaces demonstrated comparable frequencies across both timeframes. However, an increase in the frequency of buccal space involvement was observed during the COVID-19 period compared to the pre-COVID-19 period but we could not perform association tests since some variables had zero values.

Figure 6; Table 3 compare the frequency of clinical signs and symptoms in patients presenting with odontogenic infections before and during the COVID-19 pandemic. For both periods swelling was the most common clinical presentation followed by trismus. The data indicated that most clinical signs and symptoms, including swelling, trismus, and dysphagia, were more frequent during the COVID-19 period compared to the pre-COVID-19 period. However, these increases were not statistically significant ($p = 0.396$).

Patients may present with involvement of either a single fascial space or multiple fascial spaces. Likewise, clinical signs and symptoms may appear individually or in combination, depending on the severity of the infection, as outlined in Table 4. A comparison between the pre-COVID-19 and COVID-19 periods revealed a slight increase of 2.1% in cases involving multiple fascial spaces and a 5.1% rise in patients exhibiting multiple clinical signs and symptoms during the pandemic. However, these differences were not statistically significant.

Table 5 compares the etiological factors of odontogenic infections between the pre-COVID-19 and COVID-19 periods. No statistically significant differences were observed between the two timeframes. However, a closer look reveals a 9.3% decrease in infections involving the primary dentition, accompanied by a corresponding 9.3%

**Table 5** Etiological factors of cases in the pre-Covid-19 period and during the Covid-19 pandemic

| Etiological factors | Pre-Covid-19 (March 2019 - Feb 2020) | During Covid-19 (March 2020 - Feb 2021) | *P* value |
|---|---|---|---|
| *Type of Dentition* | | | 0.120* |
| Primary dentition | 50(39.4) | 40(30.1) | |
| Permanent dentition | 77(60.6) | 93(69.9) | |
| *Causative Tooth* | | | 0.126** |
| Mandibular anterior | 6(4.7) | 3(2.3) | |
| Mandibular posterior | 78(61.4) | 71(53.4) | |
| Maxillary anterior | 15(11.8) | 13(9.8) | |
| Maxillary posterior | 28(22.0) | 46(34.6) | |
| *Associated pathology* | | | 0.399** |
| Caries | 116(91.3) | 119(89.5) | |
| Pericoronitis | 7(5.5) | 12(9.0) | |
| Periodontitis | 4(3.1) | 2(1.5) | |

*Chi-square

**Fischer

increase in infections affecting the permanent dentition. Regarding the causative teeth, most categories remained stable, except for a noTable 12.6% increase in infections originating from maxillary posterior teeth. The associated pathological factors showed minimal variation across both periods.

## Discussion

This study aimed to assess the impact of the COVID-19 pandemic on patients presenting with odontogenic infections (OIs), with the expectation that hospital presentations would decline during the pandemic, while the severity of clinical presentations would increase due to factors such as movement restrictions, fear of contracting COVID-19, and limited access to healthcare services. However, the findings revealed no statistically significant difference in the overall prevalence of OIs between the pre-COVID-19 and COVID-19 periods. Similarly, there were no significant changes in patient demographics—including age, gender, ethnicity, and geographic location—or in the clinical characteristics and etiological factors associated with OIs. The only statistically significant finding was the variation in the distribution of OI cases among the three tertiary hospitals over the two time periods. This regional shift may reflect differences in local healthcare access, pandemic response measures, or hospital referral patterns during the COVID-19 outbreak. Further investigation is warranted to better understand the factors contributing to this disparity.

This study found no statistically significant difference in the number of patients presenting with odontogenic infections (OIs) between the pre-COVID-19 and COVID-19 periods. These findings are consistent with a U.S.-based study, which also reported no significant change in OI prevalence during the pandemic [31]. In the Fijian context, this outcome may be explained by regional variations in COVID-19 policy implementation, which influenced local movement and access to healthcare. For instance, differences in restrictions and transmission status between regions such as Viti Levu and the Maritime Islands likely contributed to the observed patterns in patient presentation. However, international literature presents a mixed picture. Several studies reported significant reductions in OI cases, such as a 52.1% drop in the UK [21] and a 44% decline in France [20], while others observed increases. For instance, a study in Atlanta reported a 19.8% rise in cases during COVID-19 compared to 2019 [23]. Such disparities may be attributed to differences in public health responses, healthcare accessibility, and population behavior across regions.

The current study found no significant differences in demographic patterns across the two periods. This is consistent with European and French studies, which also reported minimal variation in age or gender distributions between COVID-19 and pre-COVID-19 cohorts [20, 32, 33]. While ethnicity was not commonly reported in comparable international studies, our findings revealed that a majority of patients presenting with odontogenic infections (69.2%) were i-Taukei (Indigenous Fijians). This may suggest either greater health-seeking behavior among the i-Taukei population or a higher burden of underlying risk factors such as dental caries compared to other ethnic groups. Additionally, the study demonstrated an urban predominance, with 48.1% of cases residing in urban areas. This aligns with findings from a study in Romania [34], potentially reflecting greater access to healthcare facilities in urban settings as well as higher population density, both of which may contribute to increased presentation rates.

In terms of clinical severity, the study found no statistically significant increase in multiple space involvement or in the number of clinical signs and symptoms during the COVID-19 period. However, a slight upward trend in both parameters was observed, suggesting a possible shift toward more severe presentations, potentially due to delays in seeking care. In addition to COVID-19-related barriers such as movement restrictions and fear of infection, cultural factors may have contributed to these delays. Within Pacific Island communities, including Fiji, a more relaxed approach to health issues and a higher tolerance for pain have been noted anecdotally, which may lead individuals to postpone seeking treatment until symptoms become more severe. These cultural and behavioral factors warrant further investigation to better understand their impact on health-seeking behaviors and clinical outcomes. An American study similarly reported increased multiple-space involvement during the pandemic, though without statistical significance [31]. These

trends may indicate the potential impact of delayed presentation and fear of hospital settings during outbreaks [33]. Notably, buccal space involvement increased slightly during the pandemic, correlating with infections of maxillary posterior teeth [12], which were also found to be more frequently involved during the COVID-19 period—though not to a statistically significant degree.

With regard to etiology, caries remained the most common cause of OIs, and mandibular molars continued to be the most affected teeth, in line with previous literature [21, 35]. A 9.3% increase in infections involving permanent dentition and a 12.6% rise in maxillary posterior teeth were observed during the COVID-19 period, again without statistical significance. These trends may reflect changing care-seeking behavior or shifts in dental pathology related to prolonged neglect.

Contrary to initial expectations, the study observed a slight increase in odontogenic infection (OI) presentations during the COVID-19 period, despite widespread restrictions, public fear of infection, and anticipated access barriers. This finding was primarily driven by data from Labasa Hospital, which accounted for approximately 50% of the total cases and recorded a notable 34.7% increase in OI presentations during the pandemic period (March 2020 to February 2021). In contrast, CWM Hospital and Lautoka Hospital reported declines of 9.7% and 25%, respectively, in OI cases during the same period. These regional discrepancies are likely attributable to differing levels of COVID-19 impact and government-imposed restrictions. Labasa was not affected by community transmission during the first wave and continued operating under relatively normal conditions due to strict border controls to the islands and the absence of lockdown measures. Conversely, both Suva and Lautoka experienced lockdowns and operated under heightened COVID-19 protocols, which may have contributed to reduced hospital utilization. A qualitative study conducted in Fiji supports this interpretation, noting that government-imposed border restrictions significantly influenced clinic attendance, with patient numbers varying by geographical location [36].

The most notable finding of this study was the shift in the proportion of patients presenting with odontogenic infections across the three hospitals during the pre- and during-COVID-19 periods. This highlights the significant influence of geographic, policy, and operational factors on healthcare access and utilization during a public health crisis. While Labasa Hospital's continued operation during the pandemic—unaffected by lockdowns or community transmission—offers one explanation for the increase in its case numbers, additional contextual factors must be considered.

A qualitative study conducted in Fiji during the pandemic reported that health system limitations and covid-related policies and responses had an impact on service delivery and access in public dental clinics [36]. Dental Officers and Managers indicated that COVID-19 response policies, including reduced patient quotas and infection control protocols, led to fewer patients being seen per day. Moreover, at the height of the pandemic, both CWM and Lautoka Hospitals were designated as red zones, significantly restricting public access to these facilities [36]. Fear of contracting COVID-19 and the presence of stringent hospital entry protocols likely further discouraged patients from seeking care in these areas [20, 32, 33].

While these findings provide insight into systemic and policy-related influences, behavioral factors specific to the Fijian context remain underexplored and warrant further investigation. Understanding how patient perceptions, fears, and decision-making evolved during the pandemic is essential to fully interpret variations in healthcare utilization and to inform preparedness for future public health emergencies.

### Limitations

Despite careful study design, several limitations were encountered. A key limitation was the reliance on a manual patient information system. This process was time-consuming and frequently hindered by missing or incomplete hospital registers and medical records, many of which were either unavailable or inaccessible during data collection. These challenges led to a reduced sample size, thereby limiting the statistical power of the study to detect significant differences.

These limitations highlight a critical need for improvement in patient record-keeping practices within Fiji's healthcare system. The adoption of a robust, user-friendly electronic health information system would not only support more accurate and efficient research but also enhance the continuity and quality of patient care.

## Conclusion

This study found no evidence to support the hypothesis that the prevalence of odontogenic infections (OIs) decreased during the COVID-19 pandemic, nor was there evidence of increased hospital admissions or clinical severity of OIs during the pandemic period. Overall, the impact of COVID-19 on patients presenting with OIs to Fiji's main tertiary hospitals appeared limited. However, when hospital data were examined individually, clear regional differences emerged. CWM and Lautoka Hospitals—both affected early during the first wave of the pandemic—reported a decline in OI cases, likely due to lockdowns and movement restrictions. In contrast, Labasa Hospital, which remained COVID-free during the same period and continued normal operations, saw a significant increase in cases.

These findings suggest that regional pandemic responses and movement restrictions influenced patient access to care and the distribution of OI cases. Reduced mobility during lockdowns likely limited access to hospital-based dental care, resulting in fewer presentations in affected areas. This highlights the importance of exploring alternative methods of healthcare delivery during pandemics. Teledentistry, for example, presents a promising avenue to maintain access to care when physical visits are restricted and warrants further investigation in the Fijian context.

**Abbreviations**

| | |
|---|---|
| COVID | 19-Coronavirus disease of 2019 |
| CHHREC | College Human Health Research and Ethics Committee |
| CWMH | Colonial War Memorial Hospital |
| MoHMS | Ministry of Health and Health Services |
| MS | Medical Superintendent |
| FID | Fijian by Indian Descent |
| FNU | Fiji National University |
| OI | Odontogenic Infection |
| PATIS | Patient Information System |
| PICTs | Pacific Island Countries and Territories |
| SIRS | Systemic Inflammatory Response Syndrome |
| SPSS | Statistical Package for the Social Sciences |

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**Authors' contributions**
KT was the main contributor to the conceptualization of the study, performed all data collection, was a major contributor to data analysis and drafting and finalizing the manuscript. MN was also a contributor to the study's conceptualisation with overall supervision. She was also a main contributor in drafting the manuscript and overlooking the final submission. MM was also a contributor to the study's conceptualisation, supervision and drafting of the manuscript. SK was also a contributor to the conceptualization of the study and a main contributor to data analysis. She also contributed to the drafting of the manuscript.

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**Data availability**
The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

## Declarations

**Ethics approval and consent to participate**
This research was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and adhered to all local statutory requirements. Ethical approval was obtained from the College Human Health Research Ethics Committee (CHHREC) of the College of Medicine, Nursing, and Health Sciences (CHHREC ID: 100.22).
The study utilized secondary data, and in accordance with national regulations and ethical guidelines, the requirement for informed consent was deemed unnecessary. This waiver was formally granted by the CHHREC, as the dataset did not contain any identifiable information, and all participants' identities remained anonymous throughout the research process.

**Consent for publication**
The study did not use any data of participants, such as personal details, images or videos, as it ensured that all participants' identities were anonymous.

**Competing interests**
The authors declare no competing interests.

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## Publisher's Note