

PATTERNS OF DENTAL EMERGENCY TREATMENTS PROVIDED PRE, DURING AND POST COVID-19 CRISIS

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DOI: 10.17605/OSF.IO/6DPSX

Abstract

The aim of this study was to help in allocating ways to improve accessibility to dental care during emergency situations. Evaluation of the socio-demographic characteristics, the type of dental emergencies and emergency treatments was carried out for individuals who attended a specialized dental center in the Saudi Arabia (KSA), as well as the main reasons for accessing the dental emergency service among the population during the COVID-19 lockdown and compare the results obtained with those of the pre-lockdown and post-lockdown. COVID-19 had its tremendous impact on the emergency dental services; the number of patients, profile of patients, and the type of emergency provided were all affected as pain was the main reason for seeking treatment. Therefore, further prospective assessment of the implications of COVID-19 outbreak in dental practice is urgently needed. Any future outbreaks of similar diseases will have its impact again on the health system with the dilemma of providing dental treatments against prevention of disease spread dental health workers and communities.

Keywords: Dental Health Services, COVID - 19, Emergency, Pandemic, Dental Care

1. INTRODUCTION

In December 2019, bizarre cases of deadly “flu” were reported in Wuhan, China. Initially, the world was not aware that we were about to witness a life-threatening virus that would lead to a huge worldwide pandemic. As more cases evolved, scientists were able to isolate this fatal virus. The Coronavirus disease (COVID-19) was found to lead to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, multiorgan failure and subsequently death. A lot of uncertainties about the pathophysiology of the virus, mode of transmission and treatment confused everyone specially scientists and health care providers (Amato et al., 2020).

Ultimately close contact with symptomatic COVID-19 patients appeared to be the main route for human-to-human transmission, as the predominant method of transmission is through the inhalation of respiratory droplets, such as those produced when patients talk, sneeze, or cough (Amato et al., 2020). It has also been established that the virus may persist outside of living things, in aerosol, or on fomites for a prolonged period, increasing risk of transmission and infection (Amato et al., 2020). The outbreak of COVID-19 became the most pressing global public health challenge (Pan et al., 2020). This was one of the seldom phenomena where the entire world united. Consequently, the World Health Organization proclaimed COVID-19 to be a pandemic in March 2020 (Wang et al., 2021).

In response to the initial outbreak of the coronavirus disease 2019 (COVID-19) pandemic, lockdowns and calls for community discipline were enforced worldwide to prevent the spread of the virus. As a result, all nonessential activities were suspended at the time, both in daily life and in the medical field, leaving the only medical activity practiced for COVID-19 treatments and other emergencies (Beauquis et al., 2021).

Unfortunately, dental care does not appear to be a top priority when it comes to health services, despite the fact that it is one of the medical specialties with the largest risk of infection spread (Nemeth et al., 2021). The COVID19 pandemic has made the dentist's treatment decision crucial since the virus can spread through saliva and droplets made during dental operations (Peng et al., 2020). Therefore, any procedure that reduces the production of aerosols may be preferable to decrease the risk of infection when receiving dental care (Innes et al., 2021). Authorities have responded to this by suggesting methods for preventing infections during dental treatment or even by limiting or prohibiting elective dental care (Centers for Disease Control and Prevention, 2020)

Maintaining a dental emergency program during the COVID-19 pandemic is crucial, not only to provide proper patient care but also to inform and counsel them. According to Verma and Chambers, the most common dental emergency presentation is dental abscess, this is followed by toothache, and other less common dental emergency presentations are caries related, tooth avulsion and tooth fracture (Verma and Chambers, 2014). Another study carried out in southern Taiwan showed that trauma, periodontal issues, and pulp-related issues are the top three causes of adult dental emergency visits (Huang et al., 2022). Approximately half the patients seeking dental emergencies chief complaint are pain, followed by swelling, and trauma (Huang et al., 2022).

Furthermore, a web-based survey performed using Google forms questionnaire sent to dentists in Brazil to measure the effect of coronavirus disease 2019 (COVID-19) on elective and urgency/emergency dental care and dentists concerned showed that only 44.1% of patients reported an increase in demand for emergency care during quarantine, and this was attributed mainly to increased patient's anxiety and stress, in addition to unavailability of routine/elective dental care (Faccini et al., 2020) . Moreover, the main causes of urgencies/emergencies were toothache (71.4%), broken restorations (40.4%), dental trauma (37.3%), breakage of orthodontic appliance (25.2%), and temporomandibular disorders (TMD) (9.5%) (Faccini et al., 2020).

The literature about dental emergency cases encountered during the COVID-19 pandemic remains scarce, therefore we hereby conducted this study to evaluate the socio-demographic characteristics, the type of dental emergencies and emergency treatments carried out for individuals that attended the dental emergency center in Kingdom of Saudi Arabia (KSA), as well as the main reasons for accessing the dental emergency service among the population during the COVID-19 lockdown between April 2020 and October 2021 and compare the results obtained with those of the pre-lockdown and post-lockdown. The aim of this study is to help us allocate ways to improve accessibility to dental care during emergency situations.

2. MATERIALS AND METHODS

This study protocol was approved by the Institutional Review Board, General Directorate of Health Affairs, Hail region, KSA (IRB Registration number with KACS, KSA: H-08-L-074, IRB log no.: 2022-64)

On March 20th, 2020, the Ministry of Health (MOH) in Saudi Arabia restricted the governmental and private dental facilities to manage only dental emergencies. In addition, “Dental Emergency Protocol during COVID-19 Pandemic” was issued by the General Directorate of Dentistry, (MOH) in collaboration with General Directorate of Infection Prevention and Control to facilitate the safest practice during the pandemic. In its efforts to control the spread of COVID -19. The MOH started gradually some of its clinical and medical services for routine cases later on October 2020. The national epidemiological status of COVID-19 as well as the negative impact and consequences for delayed management cases were taken into consideration. (Saudi MOH, 2020)

Hail dental center (HDC) is a tertiary specialized dental center with twenty-three active clinics of different specialties. Following the instructions of MOH the dental services provided during the lockdown period a limited daily assignment of six emergency clinics. These clinics comprised oral examination and diagnosis, pediatric dentistry, prosthodontics, endodontics, orthodontics, and oral surgery.

The emergency/urgent dental care was defined as the following: the focus on the management of severe or uncontrolled symptoms that cannot be managed by the patient and require the patient to be seen by a dentist in a dental care center/clinic. (Saudi MOH, 2020). Due to the global coronavirus pandemic, the high risk of cross-contamination and the overload of dental facilities in a real urgency for restricting dental emergency patient flow have resulted. The proposed triage-based emergency management strategy with delayed follow up was a good compromise between limiting patient admission and ensuring effective symptom relief and pain control. The strategy can be useful in situations where regulation of the emergency patient flow is required (Beauquis et al., 2021, Ather et al., 2020, Coulthard, 2020, Meng et al., 2020)

Upon arrival to HDC, a visual triage with forehead temperature check was applied to all persons to enter the center. the score of the triage would determine whether the patient to be admitted to diagnosis clinic or reported to MOH. **(Fig. 1)** patients were informed that companions are not allowed to attend the dental visit except for instances where the patient requires assistance (e.g., pediatric patients, people with special needs, elderly patients, etc.). If companions are allowed for patients receiving treatment, they were limited to a single companion and they should also be triaged for signs and symptoms of COVID- 19 during patient check-in.



APPENDIX 4
Visual Triage Checklist
Visual Triage Checklist for Acute Respiratory Illnesses

Date: _____ Time: _____ MRN: _____
Name: _____ ID#: _____ Hospital: _____

Circle the number reflecting the patient's condition (exposure and clinical picture) and calculate the final score:

Risks for Acute Respiratory Illnesses	Score		
A. Exposure Risks (in the past 14 days prior to symptom onset)	<i>Any Patient (Adult or Pediatric)</i>		
1. Had a history of travel to areas with presumed ongoing community transmission of COVID-19 (China, Iran, South Korea, Japan, Singapore, Hong Kong, or any updated information added on CCC website : moh.gov.sa/CCC/healthp/irregulations/Documents/SuspectedCOVID19Supplement.pdf) OR A close physical contact in the past 14 days prior to symptom onset with a confirmed case of COVID-19 OR Working in or attended a healthcare facility where patients with confirmed COVID-19 were admitted.	5		
2. Exposure to a confirmed MERS case in the last two weeks	3		
3. Exposure to camel or products (direct or indirect*) in the last two weeks	2		
4. Visit to a healthcare facility that had MERS case in the last two weeks	1		
B. Clinical Signs and Symptoms	<i>Patient with Exposure Risk No. 1</i>	<i>Patient with or without Exposure Risk No. 2, 3, or 4</i>	
		<i>Pediatric</i>	<i>Adult</i>
1. Fever	1	1	2
2. Cough (new or worsening)	1	1	2
3. Shortness of breath (new or worsening)	1	1	2
4. Sore throat and/or runny nose	1	-	1
5. Nausea, vomiting, and/or diarrhea	-	-	1
6. Chronic renal failure, CAD/heart failure	-	-	1
Total Score			

*Patient or household

A score ≥ 4 , place patient in an isolation room and inform MD for assessment. MERS-CoV testing should be done only according to case definition.
A score ≥ 6 , place patient in an isolation room and inform MD for assessment. COVID-19 testing should be done only according to case definition.

Staff name: _____ ID number: _____

Fig. 1: The triage form of respiratory illnesses

The form was filled by a trained nurse onsite prior patient arrival to the center HDC. The score of the patient would determine admittance to HDC, hospital referral or report to MOH

At the diagnosis clinic, a systematic questionnaire form was filled (**Fig. 2**), intraoral and extraoral examinations would determine whether a patient is referred to clinics for emergency treatment, referred to a specialized hospital setting, or dismissed. The Data Collection sheets, i.e., systematic questionnaire forms, were used to collect the data during each visit. Patient administrative data, chief complaint, symptoms, pain intensity on a 0 to 10 numerical rating scale, medication use, diagnosis. For admitted patients, the clinical diagnosis and type of treatment provided were also recorded. Any pediatric patient in pain was referred to pediatric dentist clinic, pain scale assessment was collected for children aged <12 years with caregiver guidance, dental surgery

clinic accepted patients whom required abscess drainage, tooth extraction, orofacial swelling management. Orthodontic clinic to treat patients with broken orthodontic appliances, broken brackets/bands and over extended wires. Endodontic clinics to treat patient with need of severe pain, irreversible pulpitis, access opening and pulp extirpation. Prosthodontic clinics to repair broken partial and complete dentures, cementation of fallen crowns and bridges or smoothing of broken sharp prosthesis. The admission guidelines were indicative rather than binding, leaving a certain freedom of interpretation to the practitioners' decisions.

The Saudi Ministry of Health partially resumed regular dental services by the end of October 2022. The emergency treatments of the aforementioned specialties were recorded by electronic search on HDC administrative software for all working clinics. The number of emergency treatments on gender basis were recorded for the years 2017, 2018, 2021, 2022 for purposes of comparison of different periods.

2.1 Statistical Analysis

Statistical analysis was performed using SPSS for Windows release 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were generated and the associations between the sociodemographic variables and the reasons for attending the emergency department were examined by the Chi-square test, the independent sample t-test, and Pearson correlation test. The significance level was set at $P < 0.05$.

3. RESULTS

3.1 Patient profile and chief complaints recording during COVID-19 lockdown

A total of 865 patients (444 females, 421 males) attended the HDC during the total lockdown period. The mean age was 32.3 ± 17.9 years (median: 31 years, range 1-84 years). Of the attended patients, 655 (75.7%) were feeling pain as the chief complaint. The onset of the pain was on average 5.8 ± 10.2 days and the mean pain intensity was 5.2 ± 3.6 out of 10. Neither of pain prevalence ($P = 0.90$), nor its intensity ($P = 0.39$), nor its duration ($P = 0.34$) were affected by gender. In contrast, the patients who were complaining of pain were significantly younger (31.6 ± 17.4 years) than those who were not complaining of pain (34.8 ± 19.2 years) ($P = 0.023$). However, no significant correlations were found between patient's age and pain duration or intensity. Of the attended patients, 91 (10.5%) patients were having swelling; 73 dental abscesses and 18 cellulitis. The prevalence of swelling ($P = 0.55$), pain intensity ($P = 0.39$), and pain duration ($P = 0.34$) were not affected by gender. In addition, presence of swelling was not associated with age ($P = 0.26$).

The reasons for attending the HDC premises are shown in **Table 1**. The most common reason was endodontic problems, followed by request for dental surgery, broken teeth, and restorations-related complaints. The prevalence of these problems was not significantly different between males and females.

The patients who were complaining of broken teeth or fallen down, prosthodontic problems, and pain related to bridges were significantly older than the patients who were not complaining of these problems ($P < 0.001$). In contrast, patients who were complaining of orthodontic problems and dental problems in pediatric were seen as expected in significantly younger patients ($P < 0.001$ for both parameters).

Table 1: Reasons regarding HDC emergency services during lockdown. Different chief complaints registered for the admitted patients are shown. Only age was significantly related to some of the chief complaints presented.

Complaint	No.	%	Gender			Mean age \pm SD		
			M	F	P value	Yes	No	P value
Endodontics.	315	36.4	38.2	34.7	0.28	31.5 \pm 16.3	32.8 \pm 18.8	0.31
Surgery, inflammation or infections.	140	16.2	16.6	15.8	0.73	32.5 \pm 15.8	32.3 \pm 18.3	0.88
Broken teeth or fallen down.	75	8.7	7.1	10.1	0.12	39.8 \pm 17.9	31.6 \pm 17.8	<0.001*
Restorations related emergencies.	71	8.2	8.6	7.9	0.72	28.9 \pm 17.7	32.7 \pm 17.9	0.086
Prosthodontics emergencies	54	6.2	6.7	5.9	0.63	46.8 \pm 14.4	31.4 \pm 17.7	<0.001*
Orthodontic emergencies.	52	6.0	5.2	6.8	0.34	21.1 \pm 10.3	33.1 \pm 18.1	<0.001*
Pediatric patients	33	3.8	4.3	3.4	0.59	8.8 \pm 4.2	33.3 \pm 17.6	<0.001*
Swelling, abscess, or cellulitis.	32	3.7	4.0	3.4	0.61	31.2 \pm 19.4	32.4 \pm 17.9	0.71
Ulcers and injuries.	28	3.2	2.4	4.1	0.16	29.8 \pm 17.4	32.4 \pm 17.9	0.44
Mobility or trauma.	22	2.5	3.3	1.8	0.16	45 \pm 27.6	32 \pm 17.5	0.001*
Periodontal problems.	22	2.5	1.9	3.2	0.24	39.3 \pm 18.6	32.2 \pm 17.9	0.066
Pain related to a bridge.	13	1.5	1.2	1.8	0.46	43 \pm 13.2	32.2 \pm 17.9	0.031*
TMJ problems.	8	0.9	0.5	1.4	0.18	37.6 \pm 24.7	32.3 \pm 17.9	0.40
Total	865	100.0						

* Indicates a significant *p* value

Table 2: Emergency treatments provided to HDC patients. The count of each treatment and percentages provided by specialty emergency clinics in HDC during the lockdown period

Treatment	Frequency	Percent
Initial endodontic therapy	287	33.2
Dental extraction	139	16.1
Medications	96	11.1
Orthodontic	60	6.9
Cementation	54	6.2
Prosthodontic	51	5.9
Referred to KHH	39	4.5
Pediatric	30	3.5
Surgery	20	2.3
No treatment, open medical files only	17	2.0
Endodontics and retreatment	13	1.5
Filling	13	1.5
Initial periodontal therapy	12	1.4
Temporary filling	10	1.2
Smoothing of wire	7	0.8
Primary management of dentoalveolar trauma	5	0.6
Wound care of soft tissue including suturing	3	0.3
Abscess drainage	3	0.3
Oral hygiene instructions	2	0.2
Maxilla- mandibular fixation	1	0.1
Radiology (x ray)	1	0.1

3.2 Emergency treatments provided during Covid-19 lockdown

Most emergency treatments in HDC (**Table 2**) were admitted to the endodontic clinics which provided initial pulp therapy and retreatment (34.5% in total) followed by surgical treatments such as simple extractions, surgical extraction, trauma treatments (19.4% in total). severe cases of surgical need were referred to another hospital setting facility (39 cases).

3.3 Comparison of emergency treatments provided in the years 2017, 2018, 2019, 2021, and 2022

As shown in **Fig. 2**, the specialties sought by emergency patients before COVID-19 were fixed prosthetic dentistry followed by endodontics and removable prosthetics, and the least surgery specialty. During COVID-19, pediatric clinics were sought mostly, while after COVID-19, endodontic clinics were the most common clinics attended, and the number of patients seeking surgery increased significantly.

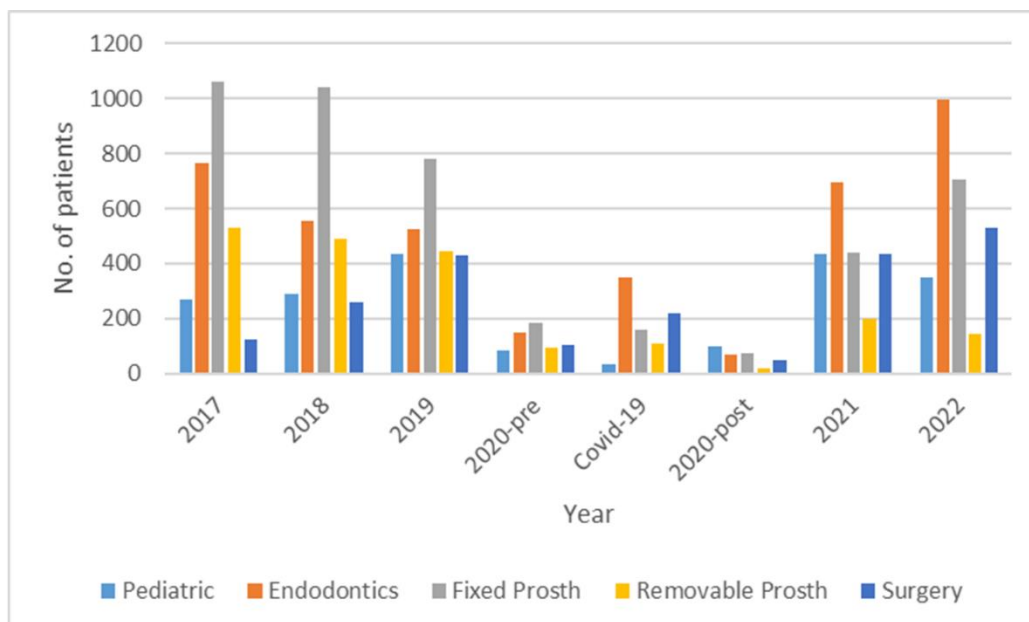


Figure 2: Total number of patients in the years before, during, and after COVID-19

3.4 Gender profile of the emergency patients pre, during and post covid-19

Before COVID-19, the highest female proportion were for patients who attended the surgery clinics followed by endodontics and least for patients who attended the removable prosthodontic clinics (**Fig. 3**). In contrast, after COVID-19, the percentage of females out of the total patients who attended the removable prosthodontic clinics increased significantly.

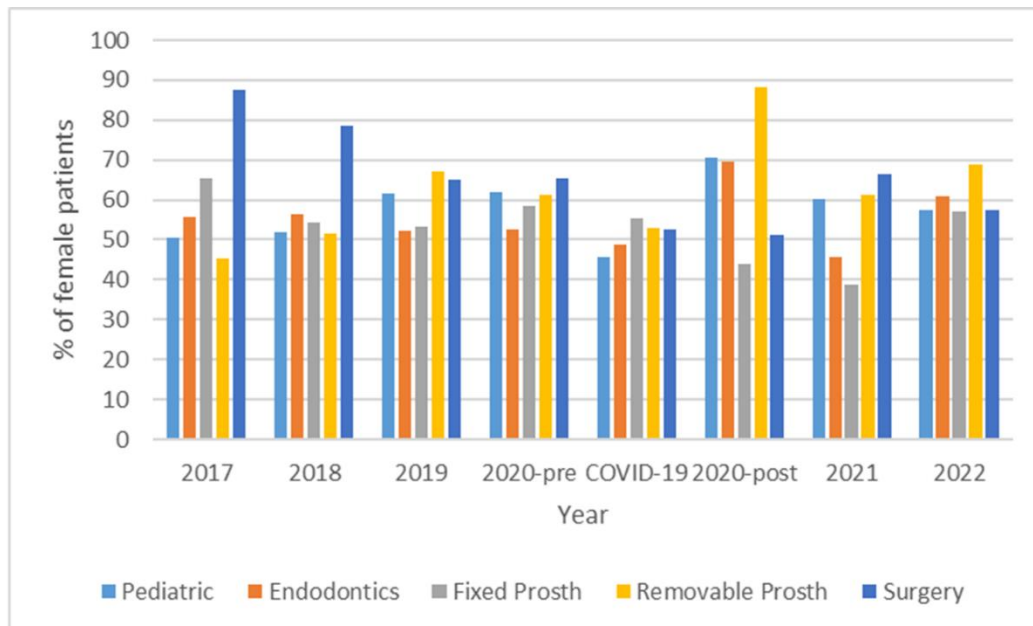


Figure 3: Percentage of female patients of total patients in the years before, during, and after COVID-19

4. DISCUSSION

This study was conducted to evaluate dental emergency services/treatments provided during COVID-19 lockdown, pre-lockdown and post-lockdown periods in a regional dental specialized center. This evaluation comprised socio-demographic characteristics, main reasons for accessing the dental emergency as well as types of emergency treatments carried out. Not only the number of patients reduced tremendously during COVID-19 crisis, there were changes in the profile of patients and types of emergency treatments when compared to literature.

Global Corona virus pandemic forced countermeasures of lockdown, ceasing social activities and curfews. The high risk of cross-contamination and the overload of hospital facilities have resulted in a real urgency for restricting dental emergency patient flow (Beauquis et al., 2021) The proposed triage-based emergency management strategy with systematic follow-up was a good compromise between limiting patient admission and ensuring effective symptom relief and pain control. The strategy can be useful in situations where regulation of the emergency patient flow is required.

Our triage policy and diagnosis had its effects on controlling admission to HDC by following the guidelines provided by Saudi MOH (AIAhdal et al., 2021). As shown in **Fig 2**, the number of patients seeking urgent dental treatments fallen tremendously from few thousands to hundreds. Another study in Brussels, Belgium (Beauquis et al., 2021) applied telecommunication by phone to control admissions. Even If the patient directly attended the hospital medical emergency department, similar teleconsultation was performed through an internal line within the central hall of the hospital. In HDC, answering the phone was part of the duties of the triage and diagnosis clinic (AIAhdal et al., 2021).

During covid 19 lockdown females consisted more than half the number of patients (444 females / 421 males). This percentage was consistent throughout the years as

more female patients were seeking emergency treatment in most dental specialties. Before COVID-19, the highest female proportion were for patients who attended the surgery clinics followed by endodontics and least for patients who attended the removable prosthodontic clinics. In contrast, after COVID-19, the percentage of females out of the total patients who attended the removable prosthodontic clinics increased significantly. These findings were inconsistent with other studies (Verma and Chambers, 2014, Huang et al., 2022) which reported males' numbers were 1.5 to 2 times higher than females when seeking dental emergency treatment regardless the type of emergency.

Meng et al 2020 (Meng et al., 2020) reported treatment of over 700 patients during the outbreak of the virus quarantine and the lockdown of the overall area at the school and hospital of stomatology at Wuhan University, Wuhan, the epicenter of the primary contagion. Emergency dental treatments, such as pulpectomy and dental extractions, were described, although no information was reported on the type of dental emergencies actually performed. This study focused on the type of dental emergency treatments in relation to the crisis.

In this study, 655 (75.7%) of the attended patients were feeling pain as the chief complaint. Pain was mostly caused by irreversible pulpitis which required management in endodontic clinics as 287 patients (33.2%) received initial pulp extirpation and intracanal medicaments under rubber dam. The dental dam can effectively reduce the amount of aerosol formed; therefore, it should be used in any procedure that allows doing so, as it has been reported that the rubber dam can reduce airborne particles by 70%.²⁷ (Nagraj et al., 2020). The extirpation of the dental pulp was executed to alleviate pain. Instrumentation of the root canal system was advised not to be performed but rather access the pulp chamber only for risk management purposes. The use of sodium hypochlorite as irrigation (higher concentrations are indicated because they are more effective in dissolving pulp tissue and a steroid-containing dressing material (Amante, Luis Filipe Lima Sobral et al., 2021).

The onset of the pain was on average 5.8 ± 10.2 days and the mean pain intensity was 5.2 ± 3.6 out of 10. Neither of pain prevalence ($P = 0.90$), nor its intensity ($P = 0.39$), nor its duration ($P = 0.34$) were affected by gender. Other causes of pain were 91 (10.5%) patients were having swelling; 73 dental abscesses and 18 cellulitis. The prevalence of swelling ($P = 0.55$), pain intensity ($P = 0.39$), and pain duration ($P = 0.34$) were not affected by gender. In addition, presence of swelling was not associated with age ($P = 0.26$). as shown in **Table 1** and **Table 2**. Other studies reported pulp-related and periodontal-related causes of orofacial pain. These causes included acute dental pain, swelling, chronic dental pain and trauma (Wang et al., 2021, Huang et al., 2022, Meng et al., 2020, Kramer, 2020, Marcenes, 2020, Moca et al., 2022). A survey (Faccini et al., 2020) indicated "Dental prophylaxis" as the most sought elective dental care by the patients, even during covid -19 crisis

Orofacial pain is highly prevalent and may reach high levels of intensity (Soysal et al., 2020, Spagnuolo et al., 2020, Tonkaboni et al., 2021). It was essential to maintain a dental emergency activity, first to ensure appropriate treatment but also to inform and advise our patients. Dental infection is notably a common and potentially severe condition, arising mostly from dental caries (Robertson et al., 2015). The high level and frequency of orofacial pain results in an elevated demand of emergency appointments in dental practice and in a certain proportion of general medical

practices and emergency departments (Robertson et al., 2015). The high risk of cross-contamination and the overload of hospital facilities gave urgency in restricting dental emergency patient flow (Ather et al., 2020, Coulthard, 2020, Meng et al., 2020). Therefore, an efficient and rationalized dental emergency management strategy was required, including the implementation of triaging and further diagnosis.

Maintaining dentures of geriatric patients in a comfortable state is crucial for thriving. General maintenance, pain, swelling, and broken dentures are the primary reasons patients are seen by a dentist (Brandolin et al., 2020). During the pandemic, these objectives were in conflict. Multiple dentures of patients in nursing houses or at home with caregivers were broken or in need of repair. Nursing houses administrators and caregivers demanded that the procedures be completed at once. If a patient is edentulous, dentures are of critical need, because a missing denture can interfere with the ability to thrive. During the pandemic complete dentures and partial dentures were disinfected, repaired on site, and delivered to caregivers or nursing house administrators within two hours.

It was decided that all children should be admitted, this is consistent with other studies and protocols applied (Beauquis et al., 2021, Achmad et al., 2020). This was due to the nature of children not to withstand pain. For children able to spit, pre-procedural mouth rinse with chlorhexidine 0.12% mouth wash was applied. Another study (Achmad et al., 2020) applied a pre-procedural rinse with 0.5%–1% hydrogen peroxide, as it has nonspecific virucidal activity against corona viruses. The emergency treatment of children was the highest in 2021 when compared to other periods

Other studies reported the use of oxidative agents in antimicrobial mouth rinses prior to dental procedures to contrast SARS-CoV-2. Mouth rinses containing 1% hydrogen peroxide or 0.2% povidone can be employed to reduce microbial load in saliva, with a potential effect on SARS-CoV-2. In particular, mouth rinses were strongly recommended in cases where the rubber dam is not employed for the dental procedure (Wang et al., 2021, Peng et al., 2020, Izzetti et al., 2020)

Regarding the few cases of orthodontic clinic, the main emergency was extended wire which caused discomfort or mucosal lacerations. A study (Faccini et al., 2020) reported breakage of orthodontic appliances are possibly due to the increased or delayed interval between appointments imposed by the quarantine.

New and potentially further problematic phenomenon for dentists is that of long COVID, also referred to as post-COVID-19 syndrome. Long COVID is a term used to describe the effects of COVID-19 that continue for weeks, or even months, beyond the initial illness (Agar et al., 2021). There is currently no research or evidence available showing the direct impact that long COVID has on oral health; however, a relationship has been suggested, with many long COVID sufferers reporting tooth loss. There could, of course, be a mechanism for COVID-19 to exacerbate dental problems or even tooth loss, with one of these being that coronavirus could damage blood vessels supplying teeth however, there is currently no data to support these theories. The exact number of people who experience long COVID symptoms is unclear (Agar et al., 2021) but during the crisis numerous dental appointments where oral hygiene advice, tooth brushing instruction, dietary advice and fluoride application were not attended, delayed or cancelled. These losses of treatment provided might have

affected the type of the oral health of our patients. Thus, the shift toward endodontic and/or surgical emergencies can be explained.

The provision of dental emergency services is an essential part of the any dental/medical system. Although the HDC is a tertiary health facility, where treatments should be provided on appointment-only basis, patients would try to seek dental urgent treatment even if it meant waiting for hours. This might be attributed to different factors such as availability of dentists, transportation, educational level of the patients, access to child care, cost concerns in avoiding private dental care as public dental care may be available at no cost. At HDC, patients mentioned other reasons as perceived severity of the complaint cannot be handled by a general dentist, having no general dentist available at the primary health care center and simply lack of trust of general practitioners as there may be delays in provision of urgent treatments.

Dental health care personnel need to understand the implications of potential transmission of the (SARS)-CoV-2 virus and other transmitted diseases in clinical setups. Hence, they need to keep themselves updated with any new information regarding emergent illnesses. New approaches such as Teledentistry will help dentists assist patients without adding the risk of cross infection.

The entire process of networking, sharing digital information, distant consultations, workup, and analysis is dealt with by a segment of the science of telemedicine concerned with dentistry known as “Teledentistry” (Bhanushali et al., 2020). Teledentistry holds the prospects to attend the treatment needs of the patients without confrontation. It not only eliminates any chance of exposure to the virus but also decreases the service cost and helps in patient education and most importantly social distancing can be maintained. Teledentistry has changed the outlook of dentistry and never has it gained a stronger foothold in the practice as it probably holds during these times. So, it becomes imperative that the dental health practitioners embrace this fundamental tool and apply it to its full potential during pandemic situations.

Healthcare professionals are in extreme danger of contracting this virus; it is not surprising that they represented 9% of all the infected individuals. (Passarelli et al., 2020) due to their direct exposure to saliva and blood. (Spagnuolo et al., 2020). A balance between the safety of the healthcare professionals yet providing optimum dental care to the patients requiring emergency intervention can be achieved by remote methods applications (Bhanushali et al., 2020).

As authors, we consider preventive and timely general dental care should be the main aims of improved dental services, so there is less need to deal with what are often preventable dental problems presenting too late for routine dental care, and in unsatisfactory emergency. Encouraging patients to seek timely and appropriate dental care may decrease the number of dental presentations as emergencies. Patient communication through telephone or visual chatting services (Verma and Chambers, 2014, Faccini et al., 2020, Caprioglio et al., 2020, Wu et al., 2021) can be used to help to relieve patient’s anxiety and stress, giving instructions for maintaining oral health, avoiding the need for a face-to-face dental appointment, instructing patients about the correct facility to attend and arranging an immediate urgent treatment.

5. CONCLUSION

Within the limitation of this study the following conclusions can be withdrawn: COVID-19 had its tremendous impact on the emergency dental services. The number of

patients, profile of patients, and the type of emergency provided were all affected as pain was the main dental emergency. Therefore, further prospective assessment of the implications of COVID-19 outbreak in dental practice is urgently needed. Any future outbreaks of similar diseases will have its impact again on the health system with the dilemma of providing dental treatments against prevention of disease spread dental health workers and communities.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical Statement

This study protocol was approved by the Institutional Review Board, General Directorate of Health Affairs, Hail region, KSA (IRB Registration number with KACS, KSA: H-08-L-074, IRB log no.: 2022-64)

Conflict of interest

The authors declare that they have no known Conflict of interest that could influence the present research.

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