Research Article

Knowledge, attitude and practice towards management of orthodontic emergency during COVID-19 pandemic among orthodontic professionals

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ABSTRACT

Introduction: An orthodontic emergency is a problem arising from an orthodontic appliance and the patient may experience pain and discomfort, where an unscheduled appointment might be required to resolve the issue. Dental care settings invariably carry the risk of SARS-CoV-2 infection due to the nature of procedures performed. The aim of this study was to assess the knowledge, attitude and practice towards management of orthodontic emergency during COVID-19 pandemic among orthodontic professionals.

Materials and Method: In this descriptive cross sectional study, evaluation of the knowledge, attitude and practice towards management of orthodontic emergency during COVID-19 pandemic were done by administering the online semi-structured questionnaire consisting of 20 questions to 120 orthodontic professionals of the Nepal through online platforms. The filled online forms were then documented for further evaluation.

Result: This study found that among the total of 120 participants, 74 (61.66%) were male while 46 (38.33%) were female. The mean age of the participants was 36.4±6.45 years while mean years of experiences was 6.15±5.55 years. Most of the orthodontists think that poking distal wire or ligature wire (87.5%) followed by periodontal abscess (85.8%) around the loose band as the most common orthodontic emergencies. Majority of the orthodontists recommended that, the patient should be triaged by telephone or through video call (79.1%), ask the patient to take picture and send to identify the type of problem (74.1%) while offer any interim self-care advise to solve the problem (58.3%) before face to face consultation. Around 57.5% of orthodontists were practicing only for urgent and emergency cases during this pandemic and lockdown.

Conclusion: This study showed that most of the orthodontic professionals had adequate knowledge about orthodontic emergency problems and had positive attitude towards their profession but the practice was limited due to COVID-19 pandemic and the risks involved in this.

KEYWORDS: Attitude, COVID-19, Knowledge, Orthodontic emergency, Orthodontic professionals, Practice

INTRODUCTION

An orthodontic emergency is described as a problem arising from an orthodontic appliance, where an unscheduled appointment is required to resolve the issue. When a patient has such an issue, a timely additional appointment may need to be arranged with a specialist. Patients who present with an orthodontic emergency may be experiencing pain or discomfort.[1]

The word "emergency" sounds something urgent and critical in the medical profession, but the orthodontic patients do not deserve such crucial attention,[2] hence, better to refer as casual attender.[3] Although few unscheduled arrivals of patients are anticipated, increased frequency bothers both the patient and the clinician. The orthodontic emergency can also be inconvenient for the patient and parents in attending for an additional, unexpected appointment due to preexisting school or work commitments.

A wide range of unscheduled appointments has been reported by various researchers in the hospital-based audits.[4,5] Some authors even discovered that almost half of the orthodontic appointments were dedicated to repair dislodged bands, ligatures, or management of soft tissue trauma.[6] Bashir shares his experience of sparing an extra day for every 10 working days to manage repair appointments.[7] It is believed that 90% of problems are caused by 10% of the orthodontic patients and those are referred as "wreckers." [8]

Consequently, repeated breakages prolong treatment time and can lead to decreased patient motivation due to a loss of confidence in the appliance or the operator. By providing appropriate timely management, inconvenience and distress to both the patient and parents may be minimized with the efficacy of the appliance still being maintained.

Dental care settings invariably carry the risk of SARS-CoV-2 infection due to the nature of procedures performed. In the dental field, for the purpose of controlling Corona virus disease 2019 (COVID-19), the fundamental preventive measure lies in the filter of patients who come to the ambulatory. Therefore, a questionnaire should be used to screen patients with potential infection of SARS-CoV-2 before they could be led to the dental chair-side, as recently suggested.[9] Another fundamental aspect is the correct use of personal protective equipment (PPE) and the strict compliance with the behavioral guidelines at the dental office.

Given that the professional can assess whether to stay open or manage emergencies only, common sense must prevail during the time of COVID-19 pandemic. One choice that can be made is to postpone routine orthodontic appointments, but patients need to be assured and followed, especially if they are experiencing discomfort or problems related to the orthodontic appliance they are using.

During the COVID-19 pandemic, it is advised that any patient requesting urgent care should first be triaged by telephone or online video-link by an orthodontist to assess the clinical urgency, establish their COVID-19 risk, offer any interim self-care advice and make an appointment for face-to-face assessment if absolutely necessary.[10]

Healthcare providers should be trained to use modern web-based communication systems with accurate assessment of indications and contraindications as it is very useful in this digital era.[11,12]

Almost all orthodontic emergencies can be managed via appropriate advice from a suitably qualified health care professional. Only acute or urgent emergencies should be offered an appointment.[13] While providing treatment to the patient, it is recommended that no aerosol generating procedures are undertaken in orthodontic emergency patients. Treatment should be restricted to the trimming and adjustment of wires that are causing trauma as simply as possible with appropriate pliers (distal end cutter or wire cutters with forceps) or simple removal of any loose appliance component.[2]

The aim of the present study was to evaluate the knowledge, attitude and practice towards management of orthodontic emergency during COVID-19 pandemic among orthodontic professionals. This study was conducted to fill this lacuna and it is hoped that these findings will be beneficial for future research as well as to enhance the knowledge, attitude and practice among orthodontic professionals in coming days.

MATERIALS AND METHOD

In this cross-sectional descriptive study, the knowledge, attitude and practice towards management of orthodontic emergency during COVID-19 pandemic was assessed by administering the online questionnaire to 120 registered orthodontic professionals of the Nepal through online platforms like emails by using the google form.

Ethical approval was obtained from institutional review committee of Institute of Medicine before conducting this study (Ref. 396 (6-11)E2 076/077).

In this study orthodontic professionals of Nepal who received speciality registration from Nepal Medical Council were included, whereas orthodontic professionals not residing in Nepal were excluded from this study.

In this online survey form, informed consent were taken from the each respondent, by clearly explaining the objectives of the study and confidentiality of data will be assured to them.

Knowledge, attitude and practices towards management of orthodontic emergency during COVID-19 pandemic were evaluated by adopting semi-structured questionnaire for collecting data, which consists of total 20 questions- out of which 5 for demographic information, 5 for knowledge, 5 for attitude and 5 for practice related questions.

Data obtained were transferred to MS-excel sheet. The data were verified and analysed statistically using SPSS Statistics Version 21.0 (Armonk, NY: IBM Corp.) with confidence level set at 95% ($P < 0.05$) to test for significance. Socio-demographic and other quantitative data were summarized and presented using numbers and percentage.

RESULT

This study found that among the total of 120 participants, 74 (61.66%) were male while 46 (38.33%) were female (Fig. 1).

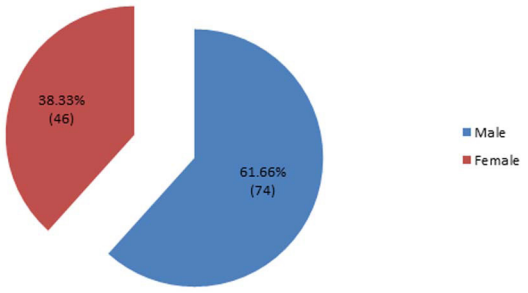

Fig. 1 Frequency of gender distribution

The mean age of the participants was 36.4±6.45 years while mean years of experiences was 6.15±5.55 years (Table 1).

Table 1: Age of the participants and years of experiences

Age of the participants	Years
Minimum age	27 years
Maximum age	68 years
Mean age	36.4±6.45years
Years of experiences	
Minimum	<1 year
Maximum	30 years
Mean years of experiences	6.15±5.55years

The other demographic distribution of the participants like working place and location of practice is summarized in Table 2.

Table 2: Demographic distribution of the participants:

Particulars/ Variables	n (%)
Working place	
Private Clinic	53 (44.16%)
Private Hospital	12 (10%)
Medical/Dental College	42 (35%)
Government Hospital	13 (10.83%)
Total	120 (100%)
Location of practice	
Province 1	8 (6.66%)
Province 2	6 (5%)
Province 3 (Bagmati Pradesh)	85 (70.83%)
Province 4 (Gandaki Pradesh)	6 (5%)
Province 5	12 (10%)
Province 6 (Karnali Pradesh)	-
Province 7 (Sudurpaschim Pradesh)	3 (2.5%)
Total	120 (100%)

In this study, most of the orthodontists think that poking distal wire or ligature wire (87.5%) followed by periodontal abscess (85.8%) around the loose band as the most common orthodontic emergencies. Most of the orthodontists (75.8%) have not received any training or courses about how to deal with patients during any pandemic. All the orthodontists (100%) are aware of the mode of transmission of COVID-19. Majority of the orthodontists recommended that, the patient should be triaged by telephone or through video call (79.1%), ask the patient to take picture and send to identify the type of problem (74.1%) while offer any interim self care advise (58.3%) to solve the problem before face to face consultation. Most of the orthodontists are aware of regarding the restriction of parents and/or siblings to access the clinic area to minimize the risk of spread of infection during this pandemic (Table 3).

Table 3: Questions regarding knowledge

Questions	Response	n (%)
1. Which of the following are considered orthodontic emergencies? (Can select more than one)	Loose bracket	25 (20.8%)
	Poking distal wire or ligature wire	105 (87.5%)
	Periodontal abscess around loose band	103 (85.8%)
	Retainer or functional appliance is broken or lost or does not fit	53 (44.1%)
2. Have you been received any training or courses about how to deal with patients during any pandemic?	None	3 (2.5%)
	Yes	22 (18.3%)
	No	91 (75.8%)
	Not sure	7 (5.8%)
3. Are you aware of the mode of transmission of COVID-19?	Yes	120 (100%)
	No	-
	Don't know	-
4. To do before providing urgent face to face care to the patient during COVID-19 pandemic (Can select more than one)	Triaged by telephone or through video call	95 (79.1%)
	Ask the patient to take picture and send	89 (74.1%)
	Offer any interim self-care advice	70 (58.3%)
	Advise them to come directly to the hospital	4 (3.3%)
5. Regarding restriction of parent and/or sibling to access the clinic area. (Can select more than one)	Only the patient is allowed into the clinic area	107 (89.1%)
	Allowing a parent to accompany younger patients	57 (47.5%)
	Not restricting the number of individuals accompanying patients	1 (0.83%)

Most of the orthodontists are agreed that orthodontist should have a role in health education services by extending the information on prevention measures for COVID-19. Many prefer to treat just emergency and urgent cases and postpone other routine cases. Most of the orthodontists think that debonding with air turbine or electric hand piece and use of three way air-water syringe should be avoided to minimize the spread of infection during this pandemic. Many orthodontists (88.3%) have plan to change the cleaning/disinfection practice in their center (Table 4).

Table 4: Questions regarding attitude

Questions	Response	n (%)
1. Orthodontist should have a role in health education services by extending the information on prevention measures for COVID-19.	Strongly disagree	-
	Disagree	-
	Neutral	5 (4.1%)
	Agree	56 (46.6%)
	Strongly agree	59 (49.1%)
2. I prefer to treat just emergency and urgent cases and postpone other cases.	Strongly disagree	-
	Disagree	2 (1.6%)
	Neutral	5 (4.1%)
	Agree	46 (38.3%)
	Strongly agree	67 (55.8%)

Questions	Response	n (%)
3. Orthodontist should avoid debonding with air turbine or electric hand piece.	Strongly disagree	1 (0.83%)
	Disagree	6 (5%)
	Neutral	56 (46.6%)
	Agree	57 (47.5%)
	Strongly agree	-
4. Orthodontist should avoid use of three way air- water syringe.	Strongly disagree	1 (0.83%)
	Disagree	5 (4.1%)
	Neutral	14 (11.6%)
	Agree	55 (45.8%)
	Strongly agree	67 (55.8%)
5. Will you change the cleaning/ disinfection practice in your center?	Yes	106 (88.3%)
	No	14 (11.6%)

Around 57.5% of orthodontists were practicing during lockdown only for urgent and emergency cases while 36.6% were not practicing during lockdown.

Most of the orthodontists (58.3%) used telephone/ online as a method of consultation to the patients while 36.6% were consulted patients both physically as well as through telephone/online. Almost all (89.9%) were aware of the current CDC or WHO Guidelines for cross-infection control regarding COVID-19. Most of the orthodontists (67.5%) were working fewer hours due to their own decision while 21.6% were working fewer hours at employer's behest. Around 70% orthodontists seek out national/regional/local news 2-5 times a day about COVID-19 (Table 5).

Table 5: Questions regarding practice

Questions	Response	n (%)
1. Are you currently practicing during lock-down?	Yes	7 (5.8%)
	No	44 (36.6%)
	Only for urgent and emergency cases	69 (57.5%)
2. What was the method of consultation?	Physically	1 (0.83%)
	By telephone/online	70 (58.3%)
	Both	44 (36.6%)
	None	5 (4.1%)
3. Are you updated with the current CDC or WHO Guidelines for cross-infection control regarding COVID-19?	Yes	107 (89.1%)
	No	10 (8.3%)
	Don't Know	3 (2.5%)
4. Has your work schedule changed?	Yes, I am working extra hours	1 (0.83%)
	Yes, I am working fewer hours and that is my own decision	81 (67.5%)
	Yes, I am working fewer hours at my employer's behest	26 (21.6%)
	No, my work schedule has not changed	12 (10%)

Questions	Response	n (%)
5. Do you seek out national/regional/ local news about COVID-19?	More than 5 times a day	18 (15%)
	Between 2-5 times a day	84 (70%)
	Once a day	-
	Every few days	16 (13.3%)
	None	2 (1.6%)

DISCUSSION

There are varieties of reasons for which patients appear for emergency appointments. These include dislodged brackets and tubes; loose bands; tearing of bands; weld failure; trauma due to extraoral appliance; soft tissue trauma with archwire, ligature wire, or bracket hooks; repair/adjustment of retainers; and dislodged module/ elastomeric chain/ligature wire. In the fixed orthodontic treatment, the most frequent reason of surprise visit is the repair of the debonded brackets with tendency of breakage higher in some teeth than the other.[14]

In this study, most of the orthodontists think that poking distal wire or ligature wire (87.5%) followed by periodontal abscess (85.8%) around the loose band followed by as the most common orthodontic emergencies while only 20.8% of the orthodontists think that loose bracket may cause the orthodontic emergency. Though this is an orthodontists perception, this finding is contradictory to the findings of one Nepalese clinical study, where the most common reason for emergency appointments was the loosening of brackets or bondable buccal tubes followed by the loosening of bands.[15]

Orthodontic appliances, besides the ill-fitting prosthesis, are supposed to be one of the major causes of physical iatrogenic injuries to the intra- and extra-oral tissues, leading patients to report back to the clinician.[16] Frequent visits may lead to loss of confidence and breach of doctor-patient relationship.[17] In addition, breakages often lead to an overall increase in treatment duration which results in a greater potential for iatrogenic damage.

The prime modes of containing this pandemic are enforcing effective social/physical distancing and use of masks but unfortunately it is not possible during carrying the dental procedures. Dental teams are at high risk of contracting the virus and potentially transmitting the SARS-CoV-2 virus due to the nature of dentistry practice,[9] specificity of its procedures, which involves face-to-face close contact, unable to worn masks by the patient during dental treatment, and frequent exposure to saliva, blood, and other body fluids, and the handling of sharp instruments.

Many dental procedures including orthodontic procedure produce aerosols and droplets that are contaminated with virus.[18] Dental devices such as high-speed dental handpiece uses high-speed air to drive the turbine to rotate at high speed and work with running water. It is hard to avoid the generation of large amounts of aerosol and droplet mixed with patient's saliva and even blood during use of dental devices.[19]

The pathogenic microorganisms can be transmitted in dental settings through inhalation of airborne microorganisms that can remain suspended in the air for long periods,[20] direct contact with blood, oral fluids, or other patient materials,[21] contact of conjunctival, nasal, or oral mucosa with droplets and aerosols containing microorganisms generated from an infected individual and propelled a short distance by coughing and talking without a mask,[19,22] and indirect contact with contaminated instruments and/or environmental surfaces.[23] Infections could be present through any of these conditions involved in an infected individual in dental clinics and hospitals, especially during COVID-19 pandemic.

It has been confirmed that those without symptoms can still spread the virus. This makes it extremely difficult to identify those individuals that pose a risk.[9] Owing to the contagious nature of the disease, while we take a history and carry out an examination of the patient and assess for urgency of dental need, an asymptomatic patient could have acted as a potent source of infection for others.

Since the health care workers themselves fall in the

high risk group for infection, exposure to them and to the health care settings is best avoided or postponed to control community spread. As per an earlier report in the early stage of the epidemic, on an analysis of hospitalized patients with SARS-CoV-2, 41% were presumed to have been infected in hospital, including 29% health care workers and 12% patients.[24]

Center for disease control 2020 (CDC 2020) has provided guideline to dental offices does not distinguish between the multiple dental specialties.[25]

During COVID-19 pandemic, It is recommended that dentists should accept in the private practice only non-deferrable urgencies, such as an abscess or irreversible pulpitis. Orthodontic problems, like general dentistry problems, represent urgencies, not true emergencies, so a video call or message with a photo might be the best options to evaluate the case.[10]

Almost all orthodontic emergencies can be managed via appropriate advice from a suitably qualified health care professional. Only acute or urgent emergencies should be offered an appointment.

A bracket may become loose or lose its metallic or elastic ligature as a consequence of eating hard or sticky foods: if the bracket remains flush with the tooth, it can be left as it is, if it seems to fall from the archwire, the patient can carefully try to remove it with eyebrow tweezers. If there is a metallic ligature that causes soft tissue trauma or pain, the patient should try to push it back with the small eraser on the back of a pencil. In the event that it is not possible, then orthodontic relief wax can be applied. Another very frequent problem, especially during the first phases of the treatment, is protruding distal ends of archwire that can cause soft tissue trauma and large and painful ulcers. If the archwire has slid round to one side, then it may be possible to reposition it with the help of eyebrow tweezers. If the patient is not able to reposition the wire, the best option is to cut it. Thin wires can be cut using a nail clipper. Disinfection can be performed by boiling the instrument in 100 °C water for 30 min.[26,27] In any case of soft tissue trauma caused by sharp objects (end of the wire or ligatures), orthodontic relief wax is a good momentary solution.

Finding of this study also showed that majority of the orthodontists recommended that, the patient should be triaged by telephone or through video call (79.1%), ask the patient to take picture and send to identify the type of problem (74.1%) while offer any interim self care advise (58.3%) to solve the problem before face to face consultation.

In this study, around 57.5% of orthodontists were practicing during lockdown only for urgent and emergency cases while 36.6% were not practicing during lockdown. Most of the orthodontists (58.3%) used telephone/online as a method of consultation to the patients while 36.6% were consulted patients both physically as well as through telephone/online.

As a health care professionals, it is our duty to mitigate the community spread of this disease through responsible and informed actions. We need to fulfill our professional duty towards our patients, and in particular obtain informed consent from the patient of the proposed treatments, while keeping ourselves, our staff and environment safe.

CONCLUSION

This study showed that most of the orthodontic professionals had adequate knowledge about orthodontic emergency problems and had positive attitude towards their profession but the practice was limited due to COVID-19 pandemic and the risks involved in this.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest regarding the publication of this paper.

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