

# Oral Health Care Practice and Circumstances during Covid-19 among Dental Patients in Tertiary Care Hospital in Nepal

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## ABSTRACT

### Background

Patients are hesitant to enter a dental hospital because of the significant danger of cross infection and illness transmission due to rapid spread of corona virus.

### Objective

To assess knowledge regarding Covid-19, oral health practices and circumstances on dental treatment during a pandemic.

### Method

Cross sectional study was conducted among patients visiting dental department of Dhulikhel hospital from September to October 2020. Questionnaires were interviewed following safety protocols regarding the pandemic and descriptive analysis was performed. Both verbal and written consent as well as ethical approval was taken before the study.

### Result

A total 411 patients aged 14 to 75 years old from 14 different districts across Nepal participated in the study. All of the patient were free of Covid-19 symptoms and had strong knowledge and awareness about disease transmission. During the crisis 96% of the people maintain good oral hygiene while 25.8% acquire new dental problems where majority experienced oral discomfort and swelling, 93.2% of them did not attend a dental clinic or hospital in the interim owing to fear and inaccessibility. Majority of the participants were impressed by the safety precautions and preparations during treatment and 99.3% strongly suggest or pledge to visit dental department if necessary during the pandemic.

### Conclusion

Dental patient visiting Dhulikhel hospital is highly aware of current health crisis, possible transmission and preventive measures. Proper safe hospital setup can encourage them to seek dental treatment during crisis. Dental pain and swelling in Endodontic department recorded most common dental emergency during this pandemic.

## KEY WORDS

*Circumstances, Covid-19, Dental patients, Knowledge, Nepal, Practice, Tertiary hospital*

## INTRODUCTION

Corona virus disease is spreading rapidly all over the world with series of multiple lockdown by government restricting movements. The World Health organization (WHO) declared the outbreak a public health emergency of international concern on 30 Jan, 2020. Around 153.5 million cases of COVID-19 have been reported worldwide till 3<sup>rd</sup> May 2021, resulting in more than 3.2 million deaths, affecting mostly the developing countries.<sup>1,2</sup> Nepal reported the first case of COVID-19 on 25<sup>th</sup> January 2019, and the first death due to COVID-19 on 16<sup>th</sup> May 2020.<sup>3,4</sup> Nepal announced first nationwide lockdown from 24<sup>th</sup> March 2020 in order to limit spread of virus by restricting movements and implemented series of extended lockdowns.<sup>5</sup> Till April 19 2021, Total 285,900 confirmed positive cases with 3,091 deaths and 2,352,502 Polymerase chain reaction (RT PCR) tests were done.<sup>6</sup>

Dental Care amid COVID-19 Pandemic: Healthcare professionals, especially Dentists work in close proximity with the patient's mouth considering potentially high-risk for cross-infection.<sup>7</sup> On 16<sup>th</sup> March 2020, the American Dental Association (ADA) recommended nationwide dentists to postpone elective treatments but to keep emergency care in hospitals emergency department.<sup>8</sup> The New York Times published an article on March 2020 with an impressive schematic figure describing dentists as the workers most at risk of being infected with COVID-19.<sup>9</sup> Also, World Economic Forum Scores Dentist as highest occupational risk score during Covid-19.<sup>10</sup> On May 2020, the Nepal Dental Association (NDA) announced interim guidelines for dental practices to protect and avoid infection in dental settings during the Covid-19.<sup>11</sup>

## METHODS

An institutional based cross-sectional study was conducted among the dental patient visiting dental department of Dhulikhel Hospital from September 2020 to October 2020 (during Nepal's peak lockdown period) to assess the knowledge, oral health care practices and circumstances among the dental patients at Dhulikhel hospital, Kavre. All the patients visiting dental department willing to participate in this study who can understand written consent were included in this study whereas patient with acute emergencies, children under the age below 12 years who can't fully agree or understand the consent and vulnerable members such as pregnant women, differently abled person and those over the age of 75 years old were excluded from the study.

Simple convenience sampling techniques were used among the patients who met the study's inclusive and exclusive criteria and were fully informed about the study's goal. Prior to the study, both verbal and written consent were obtained. During the interview, researchers

used personal protective equipment (PPE) such as a face shield with goggles, a double protective mask, disposable gloves, and frequently sanitized their hands with sanitizer while keeping a two-meter distance from the patient and protected with glass barrier between them to ensure patient and interviewer safety.

A close-ended questionnaire was prepared in Nepali language for patient's convenience since most of the patient visiting Dhulikhel hospital come from rural areas with or without educational background and access to health care facilities.<sup>12</sup> The questionnaire were divided into three parts, first section comprised basic knowledge on COVID-19, second section regarding the oral health practices and third section estimated the circumstances of the patients during the pandemic.

1. Demographic details: Date, age gender, address, contact number, employment details and academic background were recorded. Age group were dichotomized into "less than 30 years old" and "more than 30 years old". Job details were classified according to professional categories by Tyler Ridell as unskilled, semiskilled and skilled labor whereas educational background were also classified as uneducated, less than grade 10, secondary or equivalent, bachelor's degree and masters or Doctor of philosophy (PHD) equivalent.<sup>13</sup> Location of current work was also dichotomized as urban or rural.<sup>14</sup>

2. Knowledge on Covid-19: Comprises six questionnaire regarding basic knowledge, source of knowledge, symptoms, route of transmission, protective measures and hospital based viral infection.

3. Oral hygiene practice during Covid-19: There were six questionnaires regarding oral health practice and maintenance during solitary confinement. Also included means and measures to maintain oral health, any problems or emergencies in between lockdown period, treatment option and emergency response by the patients. WHO protocol concerning safety measures during treatment and attitude of health care workers towards patient during their hospital visit were also evaluated.

4. Circumstances during pandemic: This section contains five questionnaire regarding circumstances in seeking dental treatment, visit to clinic or hospital and difference in dental services provided by health care providers.

These questionnaires were followed by diagnosis or treatment priority of patient.

For unlimited population, we calculated sample size using online sample size calculator with formula  $N = Z^2 \times P \times (1 - P) / (\Sigma^2)$  where Z is the Z score,  $\Sigma$  is the margin of error, N is population size, P is the population proportion with 95% confidence interval, 5% margin of error, 0.5 population proportion with the result population size (N)=384.16, which mean 385 or more measurements or surveys are needed to have a confidence level of 95% that the real

value is within ± 5% of the measured or surveyed value.<sup>15</sup>

The recorded data from the patient were transferred into an excel sheet daily by investigators and then transferred to SPSS in the department of community and Public Health Dentistry, Dhulikhel Hospital. A descriptive analysis was used for each question to calculate the frequencies and percentages of each response. Ethical consideration were taken from the Institutional Review Committee (IRC) of Kathmandu University School of Medical Sciences.

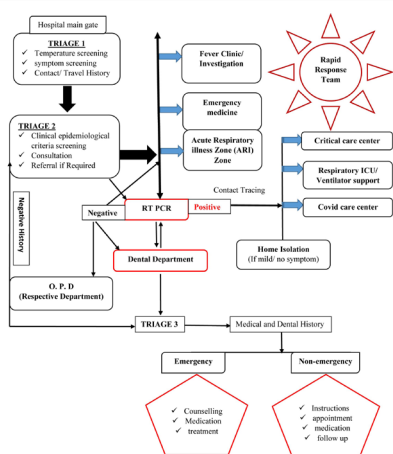


Figure 1. Dhulikhel Hospital Triage Setup during COVID pandemic

Dhulikhel hospital established various triage, fever clinics, medical wards, screening, isolation wards, and admission wards in accordance with WHO recommendations. Patients must go through a series of triage and other procedures before being screened in the dental department. According to American Dental Association, Universal precautions were followed with recent patients travel history, identifying signs and symptoms of respiratory tract infections (RTI), tracking patients’ body temperature, mouth rinsing with 1 percent hydrogen peroxide prior to beginning any operation using antimicrobial mouthwashes, using a rubber dam and high volume suction during treatment. Sixteen visitors are not permitted to enter the hospital (operating) building in order to reduce unnecessary crowding.

**RESULTS**

Out of 500 Participants, only 411 Dental patients agreed to participate in this study. Summarizes the demographic status of participants with 48% male and 52% female, 58.6% below 30 years and 41.4% above 30 years old ranging from 14-75 years old. On occupational distribution, most of the participants were students (42.6%) followed by housewife or jobless husbands (17.3%), unskilled or semiskilled workers (7.5%), skilled (6.1%), semiprofessional or professional (9.7%) and clerical, shop owner or farmer were 9.7%. Interestingly Most of the participants 139 (33.8%) were uneducated or had only education level less than grade 10. On Medical history, 88.8% participants didn’t report any known medical conditions whereas 7%

Table 1. Demographic Characteristics (n= 411)

Demographic details	N (%)	
Age	< 30 years old	241 (58.6)
	> 31 years old	170 (41.4)
Gender	Male	197 (47.9)
	Female	214 (52.1)
Occupation	Housewife/ husband	71 (17.3)
	Unskilled/Semiskilled	31 (7.5)
	skilled	25 (6.1)
	Clerical/shop owner/ farmer	40 (9.7)
	Semiprofessional/ profes- sional	40(9.7)
	students	175 (42.6)
	Refuse to answer	29 (7.1)
Work location	Urban	269 (65.5)
	Rural	142 (34.5)
Education level	Uneducated or Less than grade 10	139 (33.8)
	Secondary or equivalent	96 (23.4)
	Bachelor’s degree or equivalent	138 (33.6)
	Masters/ PHD or equivalent	24 (5.8)
Refuse to answer	14 (3.4)	

reported cardiac disease and 3.6% had Diabetes under medication. Geographical distribution shows 65.5% patient were from urban and 34.5% were from rural part of Nepal which includes different districts like Kavrepalanchowk, Bhaktapur, Bara, Sindhupalchok, Ramechhap, Sindhuli, Kathmandu, Lalitpur, Chitwan, Dhangadi, Kapilbastu, Kaski, Nawalparasi and Sarlahi.

Adopted from American Dental association guidelines which include eight different questionnaires collected in dental department triage before entering the department which shows 99.8% don’t have any Covid-19 related symptoms with themselves and within family and 99.5% don’t have travel history of Covid-19 impacted state or countries.<sup>16</sup> Around 99.3% don’t belong to Covid-19 sensitive area or have visited one such place in past one month whereas most of them 98.5% avoided unnecessary gathering, meetings or close contact with suspected Covid positive people.

Almost all of the participants except one were aware about pandemic coronavirus with most of them received information regarding disease from television or social media (49.1%) and were updated with symptoms and mode of transmission (94.6%) of the disease. While visiting dental department, all of the visitors were wearing mouth mask (100%), gloves (11%) and hand sanitizer (66.7%) and had knowledge about its importance to prevent possible transmission of the disease. Most of them were wearing surgical mask (65.9%) followed by N95 mask and cloth mask. They were also concerned about the known cases of

**Table 2. Knowledge on Covid-19 (N=411)**

Knowledge on Covid-19	Yes (N, %)	No (N, %)	(N, %)	
Are you aware about the coronavirus disease (COVID- 19 )	410 (99.8)	1 (0.2)		
First Source of information regarding Covid-19		Television	78 (19)	
		Social media	73 (17.8)	
		Family and relatives	58 (14.1)	
		Television and Social media	202 (49.1)	
Mode of transmission		Cough/ drop-let infection	66 (16.1)	
		Close contact with infected patients or objects	30 (7.3)	
		Both	293 (71.3)	
		Don't know	22 (5.4)	
Symptoms of Covid-19		Fever	66 (16.1)	
		dry cough	2(0.5)	
		throat pain	3(0.7)	
		difficulty in breathing	6(1.5)	
		All of the above	334(81.3)	
Are you using any protective measures while visiting the Dental hospital?	400 (97.3)	11 (2.7)	Type of protective measures	
			Mask	411 (100)
			Gloves	45(10.9)
			Sanitizer	274(66.7)
			Social distancing	62 (15.1)
Type of mask using during dental visit			All of above	12 (2.9)
			Surgical mask	271 (65.9)
			Cloth mask	66 (16.1)
			N95 or KN95	43(10.5)
			Surgical and N95 mask	30 (7.3)
Are you concerned to know whether the dental clinic/hospital you're seeking dental care has had any known cases of Covid-19?	354 (86.1)	57 (13.9)	sources you confirm about the cases	
			Directly from Hospital	81 (19.7)
			Social media	82(20)
			News channel	52(12.7)
			Family and friends	26(6.3)
			Either one of above	113(27.5)
Do you know about the possible transmission of Covid-19 during DentalTreatment?	327 (79.6)	84 (20.4)	Not recorded	57 (13.9)

Covid-19 positive in respective hospital which they confirm directly from hospital (19.7%), social media (20%), News channel (12.7%), family and friends (6.3%) or either one of them (27.5%). Also, most of them (79.6%) knows about the possible transmission of Covid-19 during dental treatment.

**Table 3. Oral Hygiene Practice during pandemic**

Oral Hygiene Practice	Yes	No	N (%)	
Did you maintain your oral hygiene during lockdown?	394 (95.9)	17 (4.1)	<b>If yes, how did you do it?</b>	
			Regular brushing (twice a day)	401 (97.6)
How much conscious were you to maintain oral hygiene during lockdown?			Dental Floss	24 (5.8)
			Regular Rinse/ mouth wash	43 (10.5)
			Just same as before	364 (88.6)
Did you develop a new dental issue/ problem during the lockdown period?	106 (25.8)	297 (72.3)	More than before	35 (8.5 )
			Less than before or neglected	12 (2.9)
			Type of dental problem experienced	
How did you manage those dental problems during the lockdown period? (N=126)			Emergency/ tooth pain	66 (16.1)
			Gingival pain	15(3.6)
			Sensitivity	9 (2.2)
			Trauma/ others	20 (4.9)
Did you delay your dental checkup/ needed dental procedure during the time of lockdown?	239(58.2)	166(40.4)	Not reported	301(73.2)
			Home remedies or self-medication	71 (17.3)
			Contacted my dentist	15(3.6)
Are you aware about the WHO protocols that has to be followed by dentist at the time of treatment during this pandemic?	84 (20.4)	191(46.5)	Nearby clinic or hospital for treatment	11(2.7)
			Nothing	29(7.1)
Did you find any difference in attitude of your dentist before and during this pandemic in this Hospital?	107 (26)	288(70.1)	Yes	NO
			More co-operative than normal	99 (24.1)
If yes, then what kind of difference did you notice			Uncooperative or anxious	9 (2.2)
			No significance difference	21(5.1)
			Not recorded	282(68.6)

During lockdown period, 96% patients maintain their oral hygiene with regular tooth brushing twice daily (98%), dental floss (5.8%) and regular mouthwash rinse (10%). They were conscious to maintain oral hygiene during lockdown just same as before (88.6%) whereas 2.9% neglected to maintain their oral health. Among all the patients, 25.8% develop a new dental problem during

lockdown period whereas 72.3% had old dental health issues and 16.1% had emergency tooth pain followed by gingival pain, hypersensitivity and trauma. However, only 3.6% of them managed to contact dentist and 2.7% visited nearby clinic or hospital for treatment due to restriction during lock down period and 17.3% of them managed dental problem with home remedies or self-medication. During this period 58.2% patients delayed their dental checkup or treatment. Only 20.4% of them were aware about the WHO protocols to be followed by dentist at time of dental treatment during pandemic. Regarding difference in attitude of dentist during and before pandemic in the hospital, only 26% of them reported differences in attitude of dental personnel ( 24.1% found more cooperative then normal, 2.2% reported uncooperative or anxious) whereas 70.1% of them hadn't experienced any differences in attitude of dentist during treatment.

**Table 4. Circumstances in Dental services during Covid-19**

Circumstances in Dental services during Covid-19	Yes	NO	Not recorded
Are you comfortable in seeking treatment for your dental problems during COVID-19 pandemic?	158 (38.4)	249 (60.6)	
Did you visit any clinics/ other Hospitals during this pandemic	26 (6.3)	383 (93.2)	
Did you find any difference in the dental services provided by Dhulikhel hospital and other clinics/ hospitals during this pandemic?	18 (4.4)	12 (2.9)	381(92.7)
Do you think you are also equally responsible for spreading the disease while you come to the dental department of Dhulikhel Hospital?	386 (93.9)	22 (5.4)	3 (0.7)
Would you visit this hospital again during this pandemic for your dental treatments?	408 (99.3)	3 (0.7)	
Type of patient visiting hospital during lockdown	New patient		167 (40.6)
	Old patient/Follow up		244 (59.4)
Treatment priority during visit to Hospital	Emergency/Trauma		28 (6.8)
	Surgical procedure		66 (16.1)
	Endodontic problem		140(34.1)
	Periodontal problem		16(3.9)
	Prosthodontic rehabilitation		35(8.5)
	Orthodontic treatment		126(30.7)

During pandemic, 60.6% of them were hesitant to seek dental treatment whereas 93.2% of them didn't visit any clinic or hospital despite significant dental problems due to inaccessibility, unavailability or difficulty in obtaining treatments. While visiting dental department, 93.9% of them believe they are also equally responsible for spreading the disease however 99.3 % strongly recommend

or promise to visit this hospital again if further dental treatment is required in this pandemic since most of them were impressed with protective hospital set up to combat the disease. During the study, 40.6% were new to Dhulikhel hospital for their first dental appointment and 59.4% were old patient with dental emergencies and follow up. Among them 34.1% had endodontic pain or problem, 30.7 counts orthodontic emergencies, trauma or follow up, 6.8% patients were in emergency or trauma, 16.1% need surgical procedures, 8.5% counts prosthodontic related problems and 3.9% complains of periodontal emergencies.

## DISCUSSION

The purpose of the study was to access knowledge regarding Covid-19 and its possible cross infection during dental treatment and its difficulties, circumstances and anxiety faced with dental emergencies during pandemic. The secondary objective was to assure safe dental treatment in between pandemic lockdown assessing oral health care in daily practice with pattern of dental emergencies.

Although several studies have been conducted regarding cross infections, expertise and circumstances during Covid-19 among dentist and dental students, very few have assessed this knowledge and circumstances among the patients visiting dental hospital during pandemic.<sup>17</sup> According to Centre of Disease Control (CDC), Patient with COVID-19 who are experiencing acute febrile illness are not advised to visit the dental clinic.<sup>18</sup> In that case, the dental professional should not treat the patient in dental clinic set up, but is advised to immediately quarantine the patient and notify the infection control department. Thus, taking it into consideration accordingly all the non-emergency dental care access got cancelled by second week of March, 2020 by Dhulikhel hospital and other dental health care centers in Nepal.

Our study shows adequate knowledge, attitude and practice regarding cross infection and preventive measures of Covid-19 during dental treatment which supports several study done in India among Dental patients.<sup>17,19</sup> Most of the participant were not well educated and don't have any known systematic diseases but have well knowledge and awareness about the Covid-19 disease regarding symptoms, mode of transmission and methods to protect from contagious spread among others which correlates previous study done among healthcare personnels, among Nepalese population by Asraf et al. and Paudel et al.<sup>20-22</sup> Social media and television were the main primary source of information for Covid (49.1%) while study by Basnet et al. reported 26.45% health care professional in Nepal cited social media as main source of information which states gaining popularity of social network globally, also with developing country like Nepal.<sup>20</sup>

During dental visit, all patients were wearing mouth mask, exercising social distancing while they were out of home and followed proper hand washing behavior continuously with soap or sanitizer which is effective proven practice to control infectious disease.<sup>23,24</sup> Most of them were using surgical three layered mask followed by N95 mask or in combination which seems good practice to prevent from disease as directed or messaged by government of Nepal (Ministry of Health and Population). Which also supports another study by Bains et al. stated over 98% dental patients wore a mask and over 96% would continue wearing mask after the end of the outbreak, which seems effective guidelines issued by center for disease control and Ministry of health addressing mandatory facemask use to public to prevent virus.<sup>17</sup>

Most of participant maintain their oral hygiene by regular tooth brushing whereas only few using dental floss and oral rinse which seems satisfactory oral hygiene practice by Nepalese during pandemic. Passarelli et al. also recommended oral health care by brushing twice daily, using mouth wash (1% povidone iodine) and floss daily to prevent dental emergencies during pandemic and helps to minimize oral viral load and risk of infection.<sup>25</sup> Very few hospitals were opened during lockdown so they were not accessed with nearby clinic or hospital and most of them delayed their dental checkup and procedures because of the rapid spread of disease, 93.2% didn't visit any clinic or hospital during pandemic. Although 86.1% were well concerned about Covid-19 positive cases admitted in Hospital with possible transmission sourced from hospital information center, Social media, news channel and family they seems highly satisfied with the hospital safety and preparedness regarding treatment protocol as American Dental Association and Nepal Dental Association guidelines. They feel safe with dental treatment provided by hospital and very positive with hospital staffs attitude more cooperative during pandemic. Most of them were not comfortable in dental treatment during lockdown period but after visiting Dhulikhel hospital 99.3% have positively responded with hospital management setup as per international guideline and promised to visit again if needed for dental treatment during pandemic also. Few studies by Moffat et al. and Deogade et al. mentioned about the patients perceptions about professional dental services and cross infection control measures during pandemic, this study provides information about the conditions and events that may influence patient's confidence to return to regular dental visit.<sup>26,27</sup>

Endodontic emergencies followed by surgical and orthodontic problems related to severe pain or swelling were reported during hospital visit supporting study done by Dixit et al. in Kathmandu Medical College and Teaching Hospital with majority 37.5% visited hospital with

endodontic consultation.<sup>28</sup> Another study conducted at tertiary care center in United Kingdom has found that 84% of the emergency dental patients during COVID-19 pandemic were related with Dentoalveolar surgery followed by trauma, whereas another study done in Nepal by Kafle et al. shows dental pain as most common dental emergency during lock down followed by swelling, Dento-maxillofacial trauma and orthodontic appliance breakage, which also highlights emerging Tele-Dentistry patient consultation during such pandemic and emphasizes importance of virtual consultation.<sup>29,30</sup> Tele-consultation, according to the Pan American Health Organization (PAHO) and the World Health Organization (WHO), is a secure and reliable way to diagnose suspicious cases and direct patients' diagnosis and care, reducing the risk of disease transmission.<sup>31</sup>

Stress, anxiety and depression are alarming challenges all over the world regardless of the profession and socioeconomic status. World health organization also focuses on physical and mental health during the pandemic. Poudel et al. stated that vulnerable population of developing countries are facing unique challenges regarding socioeconomic and mental health.<sup>32</sup> Worldwide, dental treatment seems challenging in this hard time and level of anxiety among dentist and dental professional seems very high, also demands proper safety training, easy availability of personal protective gears and interdisciplinary supports.<sup>33</sup> Health workers are facing high level of stress, anxiety and depression in Nepal with tendency to suicidal in some case.<sup>34</sup> Concurrently dental practitioners are also facing the same problem which force them shut down their private practice compromising socioeconomic status and others.

## CONCLUSION

The result in present study suggest that dental patient visiting tertiary hospital are highly aware of present health crisis, possible transmission and preventive measures. Also oral hygiene practice can be good support to avoid dental emergencies and helps to reduce oral viral load and risk of transmission. Although most of dental patients delayed their treatment due to the pandemic, positive attitude and behavior of hospital staffs as well as a proper and safe hospital setup can encourage them to seek dental treatment when needed which greatly influence patient's confidence in returning to regular dental visit.

Dental pain and swelling in Endodontic department recorded most common dental emergency followed by orthodontic emergencies. Tele dentistry, which is gaining popularity around the world can be a very safe and effective alternative important tool during Covid-19 outbreak and in patient management during such crisis.

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