



## Psychological and Functional Impact of Covid-19 on Orthodontic Patients

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### ABSTRACT

On 11 February 2020, the World Health Organization (WHO) announced a pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Coronavirus disease 2019 (COVID-19) was first identified in Wuhan, China, in patients with atypical pneumonia. With COVID-19 declared as a worldwide pandemic, a nationwide lockdown was implemented overnight in India on March 24, 2020. With no prior warning or anticipation, patient appointments were suspended as institutions and clinics were closed indefinitely.

**Aim:** To assess the psychological and functional impact of the COVID-19-related lockdown on the patients undergoing orthodontic treatment.

**Material and methods:** A self-designed online exploratory questionnaire of 18 questions was distributed to 380 potential responders through messages and emails. It was mandatory to answer all questions and the survey was anonymized. Online consent was taken before participation in the study. The obtained data was evaluated using descriptive statistics.

**Results:** The response rate was 78.9%. 229 (76.3%) subjects replied that COVID-19 affected their orthodontic treatment and all (100.0%) subjects missed orthodontic treatment visits. 45% of patients missed their appointments due to clinics being closed during lockdown. 108 (36.0%) subjects faced any emergency during the pandemic, 87 (29.0%) subjects experienced any loose brackets/Bands, 238 (79.3%) subjects consulted the orthodontist during the pandemic due to treatment related queries (Tele-orthodontics), 158 (52.7%) subjects had fear of delayed treatment, 300 (100.0%) subjects had appliance related problems, 99 (33.0%) subjects experienced the anxiety or stress due to fear of delayed treatment and missed

appointments during the pandemic and 11 (3.7%) subjects experienced difficulty in communicating with the orthodontist.

**Conclusion:** The study threw light on the essential need for understanding the psychology of patients undergoing orthodontic treatment. The key way to sort out these problems is proper communication of the Doctor with the patients. Tele-orthodontics plays an important role in guiding the patient to maintain proper self-care especially in the conditions when clinical visits become impossible. The doctor should understand the psychology of the patient and reassure them to follow all instruction and guidelines.

**Keywords:** Corona, COVID-19, Lockdown , Orthodontic patient, Patient psychology, Tele-orthodontics.

### I. INTRODUCTION

Coronavirus disease is an infectious disease caused by a newly discovered coronavirus affecting millions of people globally. This contagious disease has affected millions of people worldwide. Respiratory droplets, saliva and respiratory secretions can transmit the virus from one person to another. The entire country was in a state of Lockdown and Govt. had enforced various measures to prevent the transmission of this virus. It has drastically affected our personal as well as professional lives. Almost all the dental clinics and dental departments in the govt. as well as in private hospitals were closed. Orthodontic treatment are long duration treatments . They require planned and regular appointments but due to travelling restrictions , the patients undergoing orthodontic treatments were forced to visit the dental departments only during extreme emergency. This has led to various complications and marked effects on the treatment. This can lead to change in total



duration of treatment, mental attitude and behavior of the patient. The aim of this study is to find out the various impacts that the COVID 19 lockdown enforced on the active Orthodontic treatment patients.

## II. MATERIALS AND METHODS

### Ethical clearance and Informed consent

All the information regarding the survey was given to the patient and their informed consent was taken.

### Study population and sample size

The present study was conducted to analyze the problems encountered by orthodontic patients undergoing treatment during COVID-19 lockdown. A questionnaire was prepared and distributed to the orthodontic patients using Google docs. The participation in the study was voluntary. This study was carried out in a private clinic in Haryana. The study was conducted in Jan-Feb 2021. The study was descriptive cross-sectional and was carried out in orthodontic patients who started their orthodontic treatment before Jan 2020 but their treatment had been suspended since the onset of COVID-19 lockdown. The questionnaire was circulated among 380 patients. However, only 300 patients returned the questionnaire that constituted the final study.

The questionnaire consisting of 18 questions was designed in English and Hindi both keeping in mind the convenience of the patients. It also consisted of demographics such as Name, Age, Gender, Address along with the survey questions.

The survey was conducted keeping in mind all the restrictions due to lockdown. No lockdown rules were violated during the study.

The questionnaire was prepared keeping in mind the concern of orthodontic patients.

The data was numerically coded. Calculations were done using descriptive statistical analysis. The data was calculated in the form of numbers and percentages and then tabulated to obtain the final results.

## III. STATISTICAL ANALYSIS

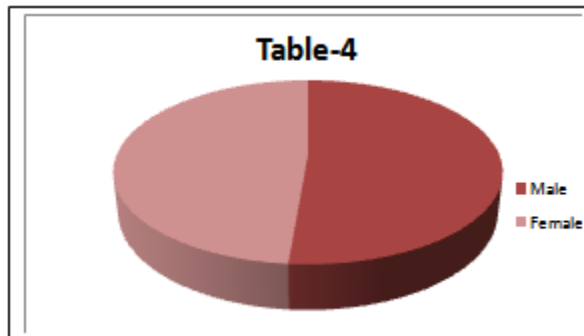
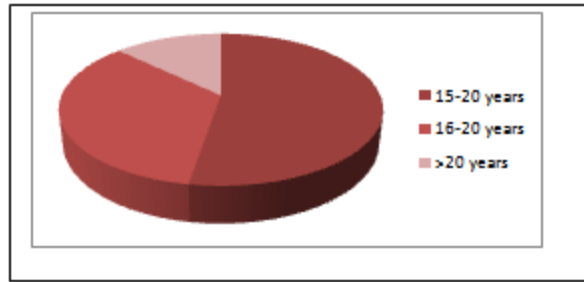
Calculations were done by using descriptive statistical analysis. Number and percentage format was used to tabulate the results. SPSS package version 25.0 (SPSS Chicago, IL, USA) was used to statistically analyze the result. Chi square was used to compare the samples.

## IV. RESULTS

The present study included 300 subjects. Out of 300 subjects, 154 (52.3%) were males and 146 (48.7%) were females. The study population was further divided into three groups according to their age. The study population had 157 (52.3%) subjects from 10-15 years, 104 (34.7%) from 16-20 years and 39 (13.0%) from more than 20 years. The age group 10-15 years constituted the majority of the study population. (Table 1)

TABLE-1

		Frequency	Percent
<b>Age group</b>	10-15 years	157	52.3%
	16-20 years	104	34.7%
	> 20 years	39	13.0%
<b>Gender</b>	Male	154	51.3%
	Female	146	48.7%
		Frequency	Percent
<b>Question 1-Do you think COVID-19 has affected your orthodontic treatment?</b>	Yes	229	76.3%
	No	71	23.7%
<b>Question 2-Did you miss any appointment due to COVID-19?</b>	Yes	300	100.0%
	No	0	0.0%
<b>Question 3-Duration of missed appointments</b>	1-2 months	115	38.3%
	2-6 months	128	42.7%
	> 6 months	57	19.0%



229 (76.3%) replied that affected orthodontic treatment and all (100.0%) subjects missed orthodontic treatment. The duration of

missed appointments was 1-2 months among 115 (38.3%), 2-6 months among 128 (42.7%) and more than 6 months among 57 (19.0%).(Table 1)

TABLE -2

		Frequency	Percent
<b>Question 4-</b> Did you face any emergency during the pandemic?	Yes	108	36.0%
	No	192	64.0%
<b>Question 5-</b> Did you experience any loose brackets/Bands?	Yes	87	29.0%
	No	213	71.0%
<b>Question 6-</b> Did you consult your orthodontist during the pandemic due to treatment related queries(Tele-orthodontics)?	Yes	238	79.3%
	No	62	20.7%
<b>Question 7-</b> Did you have fear of delayed treatment?	Yes	158	52.7%
	No	142	47.3%
<b>Question 8-</b> Did you have appliance related problems?	Yes	300	100.0%
	No	0	0.0%
<b>Question 9-</b> Did you experience anxiety or stress due to fear of delayed treatment and missed appointments during the pandemic?	Yes	99	33.0%
	No		



	No	201	67.0%
<b>Question 10</b> -Did you. Experience any difficulty in communicating with your orthodontist?	Yes	11	3.7%
	No	289	96.3%

Table 2 states that 108 (36.0%) subjects faced any emergency during the pandemic, 87 (29.0%) subjects experienced any loose brackets/Bands, 238 (79.3%) subjects consulted the orthodontist during the pandemic due to treatment related queries (Tele-orthodontics), 158 (52.7%) subjects had fear of delayed treatment, 300

(100.0%) subjects had appliance related problems, 99 (33.0%) subjects experienced the anxiety or stress due to fear of delayed treatment and missed appointments during the pandemic and 11 (3.7%) subjects experienced difficulty in communicating with the orthodontist.

TABLE 3

		Frequency	Percent
<b>Question 11</b> -Frequency of communicating with your orthodontist.	I did not have any problem	62	20.7%
	Once/ Twice	164	54.7%
	More than 5 times	74	24.7%
<b>Question 12</b> - Reason of missed appointments	Both	91	30.3%
	Clinic was closed	69	23.0%
	Fear of COVID	137	45.7%
	Out of station	2	0.7%
	Transport facilities not available	1	0.3%
<b>Question 13 (Means of communication with your dentist)</b>	No reply	61	20.3%
	Voice call	187	62.3%
	SMS	41	13.7%
	Others	11	3.7%
<b>Question 14</b> - Do you agree /disagree about closing the dental clinic to minimize the spread of COVID-19?	Strongly Agree	26	8.7%
	Agree	187	62.3%
	Disagree	72	24.0%
	Strongly Disagree	15	5.0%

Table 3 summarises that 164 (54.7%) communicated Once/ Twice and 74 (24.7%) more than 5 times with their orthodontist. 91 (30.3%) missed appointments due to Clinic being closed and Fear of COVID, 69 (23.0%) missed appointments as clinic was closed, 137 (45.7%) had

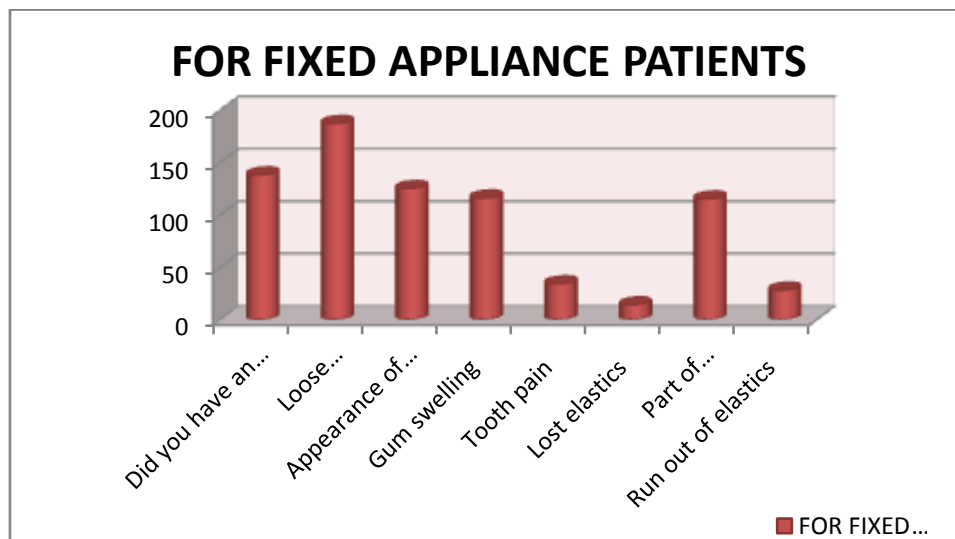
Fear of COVID and 2 (0.7%) missed appointments as they were out of station. Voice call was used as a means of communication by 187 (62.3%) and SMS by 41 (13.7%). 26 (8.7%) strongly agreed and 187 (62.3%) agreed about closing the dental clinic to minimize the spread of COVID-19.

Table:4

		Frequency	Percent
<b>Question 15</b> Type Of Appliance	Fixed Appliance,	224	72.3
	Removable Appliance	45	15.0
	Retainers	31	10.3
<b>Question 16</b> FOR FIXED APPLIANCE PATIENTS	Did you have an exposed end of wire	138	51.3%



	Loose bands / breakage of brackets	187	69.5%
	Appearance of spaces	125	46.5%
	Gum swelling /ulcers	116	43.1%
	Tooth pain	34	12.6%
	Lost elastics	14	5.2%
	Part of orthodontic band embedded in gums	115	42.8%
	Run out of elastics	28	10.4%
<b>Question 17- FOR REMOVABLE APPLIANCE PATIENTS</b>	Unfitting appliance	76	45.5%
	Broken part	95	56.9%
	Appearance of spaces	25	15.0%
	Gum swelling	49	29.3%
<b>Question 18-FOR RETAINER PATIENTS</b>	Loose appliance	13	48.1%
	Broken part	13	48.1%
	Appearance of spaces	1	3.7%



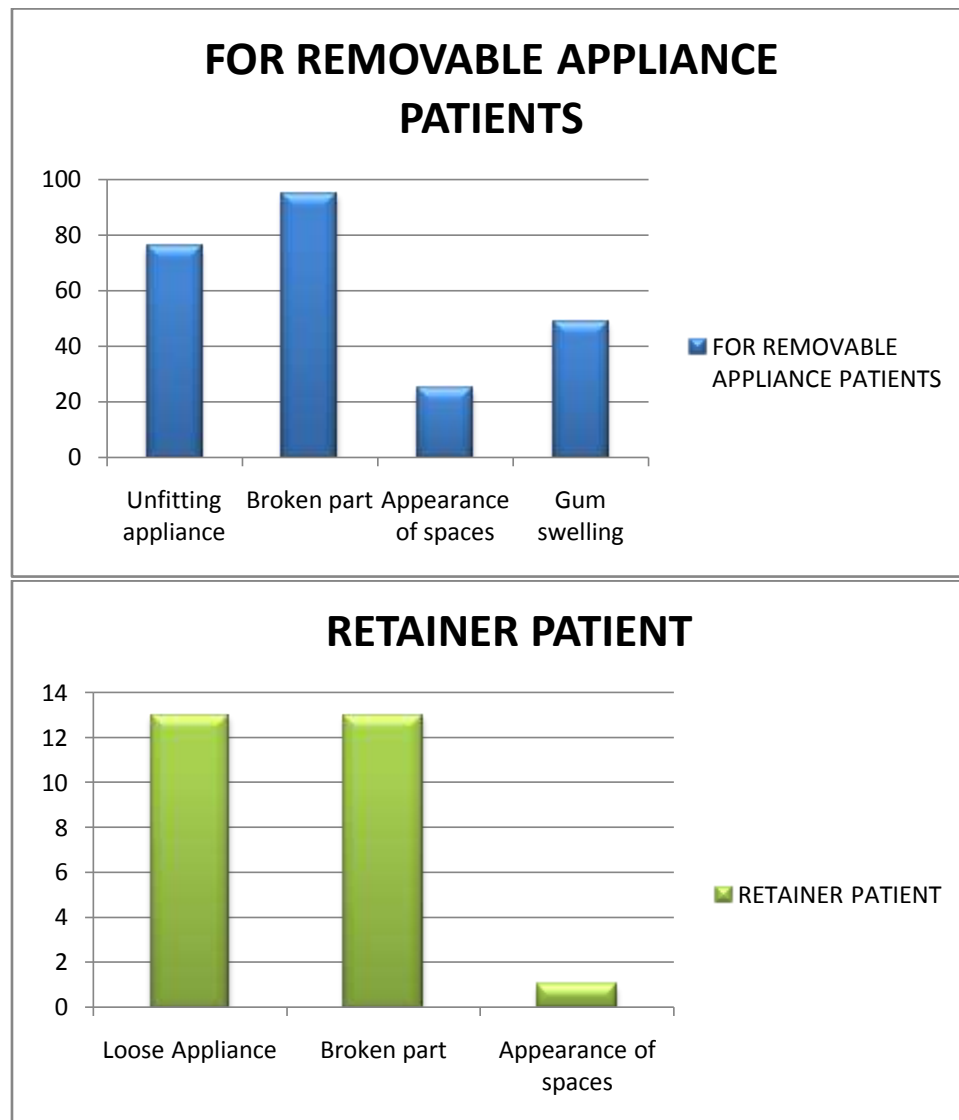


Table 4 depicts that major population of patients had fixed appliances i.e 224 patients (72.3%) , 45 patients (15%) had removable appliances and 31 (10.3%) patients had retainers.

### V. DISCUSSION

As we know that orthodontic treatment procedure is a long term treatment procedure so it includes monthly appointments of patients, outcome of treatment plans, financial point of view, complications, discomfort faced by the patients. Covid-19 hit our country in the month of January 2020 and then with in few months it gradually spread over the nation. To stop the spread of this communicable viral disease, the Govt of India announced lockdown in the country, which further led to development of anxiety among patients undergoing orthodontic treatment thus

suspending their visits to clinics. The mode of transmission of virus is mainly through aerosols, droplets, suspended particulates which are mainly generated in the dental clinic .

From our survey it is clear that about 45% of patients missed their appointments due to clinics being closed during lockdown.

From our survey it was clear that about 43% of patients missed their appointments for more than 2-6 months of time. In orthodontic treatment, brackets and appliances are placed on surface of tooth that act as a medium for accumulation of plaque. A study by Huser et al stated that “Demineralization associated with orthodontic treatment is a rapid process caused by high and continuous cariogenic challenges in the plaque developed around brackets and underneath ill fitted bands” . Therefore, during the treatment process during every appointment, oral hygiene



prophylactic measures were taken by the orthodontist. Also, all the patients were contacted frequently over voice calls and were advised to take care of their oral hygiene during the lockdown.

From the survey it is observed that 69.5% out of total 72% of patients having fixed appliance faced problem of loose or broken bands and brackets, which led to deleterious effects in the treatment.

From our survey it is seen that 36% of patients faced emergency during the lockdown period. A study by Rajesh Gyawali et al. Stated that most common reasons of orthodontic emergency are loosening of brackets and bonded buccal tubes, followed by loosening of bands. Other problem includes ulceration, tooth pain, laceration of oral mucosa due to orthodontic band impingement. The emergency problems found in our survey are listed on table no 4 of the results.

Caprioglio et al and Suri et al in their article "all orthodontic emergencies can be sorted by do it yourself solutions" for eg- cutting of distal end of wire with nail cutters or application of waxes for relief. Here comes the importance of Tele-orthodontics and virtual assistance. About 79.3% of patient took the help of Tele-orthodontics and in these population about 96.3% did not face any difficulty after assistance.

76.3% of people think that the Covid-19 pandemic has affected their orthodontic treatment, out of which 52.7% developed the fear of delay in outcome of treatment result and 33% of patients were anxious as they missed their respective monthly appointments.

23.7% of patients do not feel that Covid-19 pandemic has affected their treatment plans, as they might not face any kind of problem, but the fact is that they do not represent the vast group of population under our survey reports.

In certain treatment plans for eg: Begg's Mechanotherapy, Tip-edge Mechanotherapy or during final setting of occlusion there is a need of elastics which needs to be changed daily by the patients themselves. From our survey reports it is clear that about 10.4% of patients were running out of elastics which had put both the Doctor and the patient in a helpless situation and it ended with effects like opening of space (46.5% of patients undergoing fixed orthodontic treatment), movement of teeth like tipping which finally leads to increase in duration of treatment.

We created a whatsapp group to connect to all our patients. The aim of this group was to communicate with all the patients on a common platform and discuss their problems that they were facing related to their orthodontic treatment during

the pandemic. All their queries were answered by the doctor personally. A few patients who were not able to resolve their problems at home were asked to get Rapid Antigen test done and come to the clinic when the lockdown was eased. No lockdown rules were violated.

However finally it should be mentioned that 71% of patients under survey were concerned about spread of Covid-19 from dental clinics and suggested to close the clinics to minimize the spread of Covid-19. This study implies that at that point of time patients were focused more on general health rather than on the orthodontic treatment but simultaneously were anxious about the poor outcome of treatment due to reduced visits. We need to reassure those patients that in the dental practice all the necessary guidelines given by Health ministry of India and Dental council of India are followed to minimize the risk of exposure to the virus and its spread.

## VI. LIMITATIONS

As mentioned that it was a self-designed survey, where online questionnaires were made and were sent to the patients undergoing orthodontic treatment. Out of 380 registered patient we got 300 replies, it means nearly 79% of patient replied, and 21% of the patient were non responsive. Despite of this, this survey can hold a generalized idea on the subject of impact of covid 19 on orthodontic treatment.

## VII. CONCLUSION

This study enlightens the various problems faced by the patients undergoing orthodontic treatment. The key way to sort out these problems is proper communication of the Doctor with the patients. Tele-orthodontics plays an important role in guiding the patient to maintain proper self-care especially in the conditions when clinical visits become impossible. The doctor should understand the psychology of the patient and reassure them to follow all instruction and guidelines. Various problems like stress, anxiety, mental disturbances and fear seem to be enforced on patient by the Lockdown. Such problems should be sorted and patients should be morally boosted. With the end of lockdown all the problems which cannot be handled without clinical visits should be properly managed.

### Declaration of conflicting Interest

None declared

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### REFERENCES

- [1]. Bianco, A., Dalessandri, D., Oliva, B., Tonni, I., Isola, G., Visconti, L., Paganelli, C. and Bonetti, S., 2021. COVID-19 and Orthodontics: An approach for monitoring patients at home. *The Open Dentistry Journal*, 15(1).
- [2]. Sharma, T., Gupta, A., Sharma, A., Sharma, A. and Badyal, V., 2020. Managing Orthodontic Patients during Covid pandemic.
- [3]. Shakya, D.R., Mishra, D.R., Gyawali, R., Rimal, S.P., Lama, S., Yadav, A.K., Nepal, S., Pokharel, B. and Sapkota, N., 2020. COVID-19 Pandemic and BPKIHS: our situation, endeavors and future direction. *Journal of BP Koirala Institute of Health Sciences*, 3(1), pp.39-49.
- [4]. Gyawali, R., Pokharel, P.R. and Giri, J., 2019. Emergency appointments in orthodontics. *APOS Trends Orthod*, 9(1), pp.40-43
- [5]. . 5. Suri, Sunjay, Yona R. Vandersluis, Anuraj S. Kochhar, Ritasha Bhasin, and Mohamed-Nur Abdallah. "Clinical orthodontic management during the COVID-19 pandemic." *The Angle Orthodontist* 90, no. 4 (2020): 473-484.
- [6]. Singh Kochhar, Anuraj, and Gurkeerat Singh. "Financial Aspect of COVID-19 on Orthodontic Practice in India." *Journal of Indian Orthodontic Society* 54, no. 3 (2020): 276-277.
- [7]. Saccomanno, S., Quinzi, V., Sarhan, S., Laganà, L. and Marzo, G., 2020. Perspectives of tele-orthodontics in the COVID-19 emergency and as a future tool in daily practice. *European journal of paediatric dentistry*, 21(2), pp.157-162.
- [8]. Gomes, S.C., Varela, C.C., Da Veiga, S.L., Rösing, C.K. and Oppermann, R.V., 2007. Periodontal conditions in subjects following orthodontic therapy. A preliminary study. *The European Journal of Orthodontics*, 29(5), pp.477-481.
- [9]. Saltaji, H. and Sharaf, K.A., 2020. COVID-19 and orthodontics—a call for action. *American Journal of Orthodontics and Dentofacial Orthopedics*, 158(1), pp.12-13.
- [10]. Checchi, Vittorio, Pierantonio Bellini, Davide Bencivenni, and Ugo Consolo. "COVID-19 dentistry-related aspects: a literature overview." *International dental journal* (2021).
- [11]. Rahman, Naomi, Shrina Nathwani, and Thayalan Kandiah. "Teledentistry from a patient perspective during the coronavirus pandemic." *British dental journal* (2020): 1-4.
- [12]. Ilangovan, K., Muthu, J., Balu, P., Devi, S. and Ravindran, S.K., 2020. Recommendations for Dental Management during COVID-19 Pandemic. *SBV J. Basic. Clin. Appl. Heal. Sci*, 3, pp.56-58.
- [13]. Gurzawska-Comis, K., Becker, K., Brunello, G., Gurzawska, A. and Schwarz, F., 2020. Recommendations for dental care during COVID-19 pandemic. *Journal of clinical medicine*, 9(6), p.1833.
- [14]. Clark, James R. "Oral hygiene in the orthodontic practice: Motivation, responsibilities, and concepts." *American journal of orthodontics* 69, no. 1 (1976): 72-82. Richter, A.E., Arruda, A.O., Peters, M.C. and Sohn, W., 2011. Incidence of caries lesions among patients treated with comprehensive orthodontics. *American Journal of Orthodontics and Dentofacial Orthopedics*, 139(5), pp.657-664.
- [15]. Sadowsky, Cyril, and Ellen A. BeGole. "Long-term effects of orthodontic treatment on periodontal health." *American journal of orthodontics* 80, no. 2 (1981): 156-172.
- [16]. Srirenlakshmi, M., Venugopal, A., Pangilinan, P.J.P., Manzano, P., Arnold, J., Ludwig, B., Cope, J.B. and Bowman, S.J., 2020. Orthodontics in the COVID-19 era: the way forward part 2 orthodontic treatment considerations. *Journal of clinical orthodontics: JCO*, 54(6), pp.341-349.
- [17]. García-Camba, P., Marciães, M. and Morales, M.V., 2020. Changes in orthodontics during the COVID-19 pandemic that have come to stay. *American Journal of Orthodontics and Dentofacial Orthopedics*, 158(4), pp.e1-e3.
- [18]. Caprioglio, Alberto, Giulia B. Pizzetti, Piero Antonio Zecca, Rosamaria Fastuca, Giuliano Maino, and Ravindra Nanda. "Management of orthodontic emergencies during 2019-NCOV." (2020): 1-4.
- [19]. BBC News. Coronavirus: India enters "total lockdown" after spike in cases. <https://www.bbc.com/news/world-asia-india-52024239>; 2020. Accessed Mar 31, 2020. Google Scholar
- [20]. Chen, P, Mao, L, Nassis, GP, Harmer, P, Ainsworth, BE, Li, F. Coronavirus disease (COVID-19): the need to maintain regular physical activity while taking precautions. *J*





- Sport Health Sci. 2020; 9:103-104. Google Scholar | Crossref | Medline
- [21]. Sheno, Susmita Bala, Sumedh Deshpande, and Roopa Jatti. "Impact of COVID-19 Lockdown on Patients Undergoing Orthodontic Treatment: A Questionnaire Study." *Journal of Indian Orthodontic Society* 54, no. 3 (2020): 195-202.