

The Pandemic Impact of COVID 19 on Orthodontic Practice: A Cross Sectional Study

Muralidharan Dhanasekaran¹, I. Bevin Shaga², Harish Ponniah³, Padmasree Sankaranarayanan⁴, Nagappan Nagappan⁵, T. M. Parameswaran⁶

¹Associate professor, Department of Orthodontics and Dentofacial Orthopedics, Karpaga Vinayaga Institute of Dental Sciences, Chengalpet, Tamil Nadu, India, ²Assistant professor, Department of Orthodontics and Dentofacial Orthopedics, Rajas Dental College, Tirunelveli, Tamil Nadu, India, ³Assistant professor, Department of Orthodontics and Dentofacial Orthopedics, Ragas Dental College and Hospital, Chennai, Tamil Nadu, India, ⁴Associate professor, Department of Prosthodontics and Implantology, Chettinad Dental College and Research Institute, Kancheepuram, Tamil Nadu, India, ⁵Associate professor, Department of Public health dentistry, Chettinad Dental College and Research Institute, Kancheepuram, Tamil Nadu, India, ⁶Assistant professor, Department of Orthodontics and Dentofacial Orthopedics, Tagore Dental College and Hospital, Chennai, Tamil Nadu, India

Submitted: 02-Mar-2021

Revised: 20-Apr-2021

Accepted: 17-Jun-2021

Published: 10-Nov-2021

INTRODUCTION

On December 2019, a novel coronavirus (CoV) or severe acute respiratory syndrome CoV-2 (SARS-CoV-2) outbreak was originated in the city Wuhan, China. It is type of zoonotic infection where

ABSTRACT **Aim:** The objective of this study was to determine the problem encountered by an orthodontist due to suspended treatment during and after lockdown COVID 19 and to assess the pandemic impact on orthodontic practices. **Materials and Methods:** This was a cross-sectional web-based questionnaire survey conducted among orthodontist in India. The pilot study was conducted to estimate the sample size and final sample size is 263 participants. The predesigned and validated, self-administered, structured 10 questions related to the impact of an orthodontist and their orthodontic practices during and after COVID 19 are used. The statistical analysis was done using Statistical Package for Social Sciences SPSS (V 22.0) the frequency distribution was computed. **Results:** The result showed that 81% orthodontist were reported that routine orthodontic treatment was disturbed due to this COVID 19 lockdown, about 79.1% reported hospital/clinic was closed due to lockdown with a duration of more than 1 month. Still, 64.6% orthodontist handling their orthodontic emergencies through telecommunication and 47.9% of orthodontist received a complaint about fixed appliance among all other appliances. Due to the current situation, 41.4% orthodontist suggested 3–6 months' period required to normalize the current situation and 66.9% agreed that there will be decline in orthodontic treatment need after COVID 19. **Conclusion:** Owing to the high virulence activity, elective procedures have been postponed and can manage a patient through virtual teleconsultation. Reassurance of the patient is needed regarding prolonged treatment duration due to this COVID 19 pandemic.

KEYWORDS: COVID 19, dentistry, orthodontic practice, orthodontist

Address for correspondence: Dr. Muralidharan Dhanasekaran, Department of Orthodontics and Dentofacial Orthopedics, Karpaga Vinayaga Institute of Dental Sciences, Chengalpet - 603 308, Tamil Nadu, India. E-mail: mural_ramu06@yahoo.co.in

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Dhanasekaran M, Shaga IB, Ponniah H, Sankaranarayanan P, Nagappan N, Parameswaran TM. The pandemic impact of COVID 19 on orthodontic practice: A cross-sectional study. J Pharm Bioall Sci 2021;13:S1024-8.

Access this article online	
Quick Response Code: 	Website: www.jpbonline.org
	DOI: 10.4103/jpbs.jpbs_127_21

the origin of infection was suspected from bats, then transmitted to an unknown intermediate host, and finally infected humans.^[1] Few studies reported that pangolins and snakes are the intermediate host.^[2,3] On March 11, 2020, due to the worldwide spread of COVID 19, the WHO declared COVID-19 as a pandemic. As of June 24, 2020, there have been confirmed cases of 9,455,953 people were affected in the whole world and global death of 483,460 (data available at <https://coronavirus.jhu.edu/>).^[4]

The most common routes of spread of infection from one individual to others are through droplets, aerosol, contaminated surfaces, and fecal-oral route.^[5-8] It is considered a life-threatening infection because no standard vaccine and drugs been discovered till now.^[9,10] The pandemic which is predicted to impact dental and orthodontic practice, it is a challenge that has to be addressed in near future due to high risk of contamination.

One of the most common questions faced by the orthodontist in day-to-day practice is, how long should I have to wear my orthodontic braces? Since the initiation of the COVID 19 pandemic, scheduled orthodontic appointments were abruptly disturbed and millions of patients are affected. The multitude factors play a major role in accomplishing the desired result of orthodontic treatment.^[11] Consolidated guidelines and information were formulated by federal, provincial, and local health regulatory authorities to avert the spread of infections, so unable to provide routine orthodontic care unless it is an emergency orthodontic treatment.^[12] As a result of this COVID 19 pandemic, orthodontist and orthodontic practices were immensely affected. Currently, there is no information regarding the status of the orthodontist and their orthodontic practices during COVID 19.

Hence, the aim of the study was to determine the problem encountered by an orthodontist due to suspended treatment during and after lockdown COVID 19 and to assess the pandemic impact on orthodontic practices.

MATERIALS AND METHODS

A cross-sectional descriptive questionnaire survey was conducted among the practicing orthodontist and post graduate orthodontic students in all over India using an online questionnaire form. A web-based questionnaire form was developed with the help of Google form from the Google site. Pretesting of the questionnaire was done randomly on 10 selected orthodontists. The questionnaire was finalized after equivocal and inappropriate questions were altered. A pilot study was conducted to determine the sample size. After, conducting a pilot study, the final sample size arrived was 256 subjects. Pretesting and pilot study sample

was not included in the main sample size. A structured questionnaire was framed which contained 10 questions related to the impact of an orthodontist and their post graduate students during and after COVID 19 and online questionnaire link was forwarded to 300 orthodontists. A convenient sampling technique was used. All participants completed questionnaires with the duration of 2 months from March to April 2020. The questionnaires were completed by 289 participants and their responses were recorded in the Google form, of which 263 were decided after eliminating the inaccuracies. After a brief introduction on the purpose and intent of the study, an informed consent form was obtained from every participant involved in the survey. Confidentiality of the information provided was assured and participation was purely voluntary.

The inclusion criteria for the present study include those who completed MDS and those who are studying MDS in the branch of orthodontics and dentofacial orthopedics. Orthodontists who were not willing to participate in the study and unable to give informed consent were excluded.

The data collected were entered into Microsoft Office Excel and analyzed using the Statistical Package for Social Sciences SPSS (V 22.0) (SPSS Inc., Chicago, Illinois, USA). The frequency distribution was computed.

RESULTS

Among 263 study subjects, 58 (22.1%) have own private clinic, 87 (33.1%) were consultant orthodontist, 5 (1.9%) were working in government hospitals, 13 (4.9%) were working in a private college, 9 (3.4) were orthodontic post graduate students, 91 (34.6%) were combination of private clinic, consultation, academician, and post graduate students were involved in this study [Table 1].

A total of 213 (81%) orthodontist were accepted that routine orthodontic treatment was abruptly disturbed due to this COVID 19 lockdown, whereas 5 (1.9%) were not ready to accept, 45 (17.1%) were reluctant to accept it [Figure 1].

The majority of orthodontist 205 (77.9%) agreed that their patient well understood the current situation and aware that treatment time will prolong due to this unscheduled appointment during lockdown. Other 2 (0.8%) denied to accept it and 56 (21.3%) were unsure about it [Figure 1].

About 176 (66.9%) agreed that there will be decline in orthodontic treatment need, whereas remaining 53 (20.2%) orthodontists opposed this statement. Likewise, 34 (12.9%) were in dilemma [Figure 1].

Most of the respondents 208 (79.1%) reported hospital/ clinic was closed due to lockdown with a duration of more than 1 month, followed by 50 (19.0%) orthodontist practice was interrupted for the duration of 1 month and other 5 (1.9%) orthodontist reported 1 week [Table 2].

Out of 263 orthodontists, 170 (64.6%) handling their orthodontic emergencies through telecommunication as much as possible during this lockdown. The result further revealed that 71 (27.0%) encountered a problem regarding loose brackets, 53 (20.2%) suggested impinging wire, 7 (2.7%) were reported swelling/trauma, 7 (2.7%) were soft-tissue soreness, remaining 125 (47.5%) faced problem from a combination of loose bracket, impinging wire, and soft tissue injuries [Table 3].

Information related to Table 4 were a different type of appliance causing pain/discomfort to the patient is given in which indicates majority of orthodontist 126 (47.9%) falls in fixed appliance category, followed by 21 (8.0%) delineated about aligners, 31 (11.8%) reported retainers and 85 (32.3%) were combination of all the appliances [Table 4].

One hundred and nine (41.4%) orthodontists suggested that 3–6-month time period required to normalize the current situation. Others' suggestions were 117 (44.5%) reported 3 months, 5 (1.9%) reported more than 6 months, 32 (12.2%) were unaware about it due to unprecedented nature of the disease [Table 5].

Most of the orthodontists received payment from the patient but their treatment is not started because of COVID crisis. Most of the orthodontists 121 (46%) planned to start the treatment, whereas others 118 (44.9%) were planning to start after COVID 19 ends, 5 (1.9%) were planned to refund the amount, 19 (7.2%) not yet decided due to unforeseeable situation [Table 6].

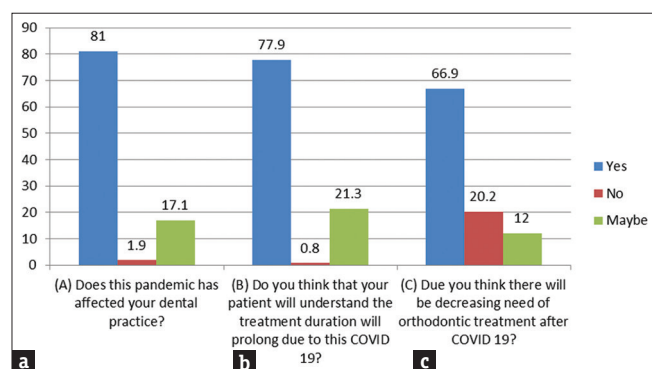


Figure 1: (a) Does this pandemic has affected your dental practice? (b) Do you think that your patient will understand the treatment duration will prolong due to this COVID 19? (c) Do you think there will be decrease in need of orthodontic treatment after COVID 19?

DISCUSSION

The aim of the survey is to evaluate the impact of orthodontist and their practices during COVID 19 and to explore how practitioners deal with orthodontic emergencies and their patient management. The survey was carried out with 263 orthodontist where consultant orthodontist, private practitioners, government

Table 1: Types of orthodontic practitioners

Type of clinical practice	Frequency, n (%)
Private clinic	58 (22.1)
Consultant orthodontist	87 (33.1)
Government hospital/college	5 (1.9)
Private college	13 (4.9)
Post graduate	9 (3.4)
Combination of any of the above	91 (34.6)
Total	263 (100.0)

Table 2: Duration of college/clinic under lockdown

Period	Frequency, n (%)
About 1 week	5 (1.9)
About 1 month	50 (19.0)
>1 month	208 (79.1)
Total	263 (100.0)

Table 3: Emergency complaint received during teleconsultation

Most common complaint	Frequency, n (%)
Loose brackets	71 (27.0)
Impinging wire	53 (20.2)
Swelling/trauma	7 (2.7)
Soft tissue soreness	7 (2.7)
Combination of any of the above	125 (47.5)
Total	263 (100.0)

Table 4: Types of orthodontic appliance cause discomfort during lockdown

Types of appliance	Frequency, n (%)
Fixed appliances	126 (47.9)
Aligners	21 (8.0)
Retainers	31 (11.8)
Combination of any of the above	85 (32.3)
Total	263 (100.0)

Table 5: Duration of time needed to normalize orthodontic practice

Time taken	Frequency, n (%)
1-3 months	117 (44.5)
3-6 months	109 (41.4)
>6 months	5 (1.9)
Don't know	32 (12.2)
Total	263 (100.0)

Table 6: Management of orthodontic patient during coronavirus disease 2019

Management	Frequency, n (%)
Refund the amount	5 (1.9)
Planning to start treatment	121 (46.0)
Treatment will start ASAP pandemic ends	118 (44.9)
Not yet decided	19 (7.2)
Total	263 (100.0)

ASAP: ASAP-AS SOON AS POSSIBLE

employees, academicians in private college, post graduate students were involved to evaluate the current status of practices in lockdown period. Likewise, a similar study was conducted by Alqahtani *et al.* conducted a study among 161 orthodontists working in the Kingdom of Saudi Arabia to assess the level of job satisfaction and factors generally affects their performance.^[13]

The current study showed that 79.1% of orthodontists were not practicing for more than 1 month due to this outbreak of COVID 19. An outbreak abruptly disturbed the patient treatment time. The multitude factor plays an important role in successful orthodontic treatment. Shia stated that success of practitioners solely tied to the predicting accurate treatment time. Poor patient compliance, broken appointments, and equipment damage were the most important factors for variance in the treatment period, according to an assessment done on 500 treated patients in his private clinics.^[11]

This evidence was further supported by Fink DF and Smith RJ findings. They analyzed relationship between broken appointment and treatment duration where 0.8 month period of treatment time duration was added per broken appointment.^[14] Conversely, Vig *et al.* listed other factors were responsible for longer treatment time like treatment phases, one or both arches involved, molar relationship, age of the patient, extraction versus nonextraction.^[15]

During COVID 19 lockdown, the most common problem encountered by the patient is orthodontic emergencies like loose brackets, impinging wires soft-tissue injuries. About 47.9% of orthodontists received patient compliance regarding the fixed appliance comparing to other types of orthodontic treatment. Major concern for orthodontist during lockdown period is the management of orthodontic emergencies. Favero *et al.* stated that minor orthodontic emergencies can be solved easily at home with the help of telecommunication, through this patient visit to the dental office can be limited.^[16] Suri *et al.* illustrated the management of orthodontic emergencies in home during COVID, which might help orthodontist to manage patient effectively through telecommunication.^[17] Likewise, most up-to-date recommendations and guidelines were

provided by the large health organizations to handle orthodontic emergencies.^[12,18]

Ferneini reported that this COVID 19 pandemic will have an impact on every aspect of global economy and considered to be game-changer in both medical and dental field.^[19] Even though, our first responsibility of health care professionals is to focus on preventing the spread of infection. Current survey conducted to assess the need of the orthodontic treatment where results show that 66.9% of respondent reveals that pandemic has major impact on economic status of an individual and there might be depletion in the rate of treatment need. As of now, no one knows the duration of pandemic affects orthodontic practice. The present study results show that minimal duration of 3–6 months required for normalize the current situation reported by 41.4% of orthodontist. Before the beginning of SARS-CoV-2, many orthodontists would have collected payment from the patient, but failed to start treatment due to uncertain situation, in such condition most of respondent like 118 orthodontists in the current survey planned to start treatment with proper protective measures.

CONCLUSION

As an orthodontist, we should explore long-term measure to reduce transmission and we must focus on preventing future outbreaks. Owing to the high virulence of CoV, elective procedures have been postponed until the situations are in control. All we can do is virtual teleconsultation through this patient visits to dental office can be reduced. For treating orthodontic emergencies, proper screening of patients for (SARS-CoV-2) exposure is highly mandatory. As we discussed earlier, treatment duration will be prolonged due to broken or missed appointment, we should make sure that we reassure patients regarding treatment duration due to outburst of pandemic.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, *et al.* The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak – An update on the status. *Mil Med Res* 2020;7:1-0.
- Ji W, Wang W, Zhao X, Zai J, Li X. Homologous recombination within the spike glycoprotein of the newly identified coronavirus may boost cross-species transmission from snake to human. *J Med Virol* 2020;92:433-40.
- Lam TT, Jia N, Zhang YW, Shum MH, Jiang JF, Zhu HC, *et al.* Identifying SARS-CoV-2-related coronaviruses in Malayan

- pangolins. *Nature* 2020;583:282-5.
4. Coronavirus.jhu.edu COVID-19 Case Tracker 25 June 2020. Available from: <https://coronavirus.jhu.edu/>. [Last accessed on 2020 Jun 25].
 5. Yu IT, Sung JJ. The epidemiology of the outbreak of severe acute respiratory syndrome (SARS) in Hong Kong—What we do know and what we don't. *Epidemiol Infect* 2004;132:781-6.
 6. Li Y, Huang X, Yu IT, Wong TW, Qian H. Role of air distribution in SARS transmission during the largest nosocomial outbreak in Hong Kong. *Indoor Air* 2005;15:83-95.
 7. Otter JA, Donskey C, Yezli S, Douthwaite S, Goldenberg SD, Weber DJ. Transmission of SARS and MERS coronaviruses and influenza virus in healthcare settings: The possible role of dry surface contamination. *J Hosp Infect* 2016;92:235-50.
 8. Ong SW, Tan YK, Chia PY, Lee TH, Ng OT, Wong MS, *et al.* Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *JAMA* 2020;323:1610-2.
 9. Adhikari SP, Meng S, Wu YJ, Mao YP, Ye RX, Wang QZ, *et al.* Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: A scoping review. *Infect Dis Poverty* 2020;9:29.
 10. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, *et al.* A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature* 2020;579:270-3.
 11. Shia GJ. Treatment overruns. *J Clin Orthod* 1986;20:602-4.
 12. Aaoinfo.org. COVID-19 Resources for Orthodontists 16 June 2020. Available from: <https://www1.aaoinfo.org/covid-19/>. [Last accessed on 2020 Jun 24].
 13. Alqahtani ND, Alshehry K, Alateeq S, Alturki H, Albarakati S, Asiry MA, *et al.* An assessment of job satisfaction: A cross-sectional study among orthodontists of Saudi Arabia. *J Orthod Sci* 2018;7:4.
 14. Fink DF, Smith RJ. The duration of orthodontic treatment. *Am J Orthod Dentofacial Orthop* 1992;102:45-51.
 15. Vig PS, Weintraub JA, Brown C, Kowalski CJ. The duration of orthodontic treatment with and without extractions: A pilot study of five selected practices. *Am J Orthod Dentofacial Orthop* 1990;97:45-51.
 16. Favero L, Pavan L, Arreghini A. Communication through telemedicine: Home teleassistance in orthodontics. *Eur J Paediatr Dent* 2009;10:163-7.
 17. Suri S, Vandersluis YR, Kochhar AS, Bhasin R, Abdallah MN. Clinical orthodontic management during the COVID-19 pandemic. *Angle Orthod* 2020;90:473-84.
 18. www.ada.org. Coronavirus Frequently Asked Question. 22 June 2020. Available from: <https://success.ada.org/en/practice-management/patients/coronavirus-frequentlyasked-questions>. [Last accessed on 2020 Jun 24].
 19. Ferneini EM. The financial impact of COVID-19 on our practice. *J Oral Maxillofac Surg* 2020;78:1047-8.

Copyright of Journal of Pharmacy & Bioallied Sciences is the property of Wolters Kluwer India Pvt Ltd and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.