

IMPACT OF COVID-19 OUTBREAK ON PATIENTS' CLINICAL APPOINTMENTS, ANXIETY AND CONCERNS REGARDING ORTHODONTIC TREATMENT

¹AYESHA IFTIKHAR, ²SOHRAB SHAHEED, ³TAYYABA JAHANZEB

ABSTRACT

COVID-19 pandemic has affected social, personal and mental health of the people all over the world. Hence, this study aimed to assess the level of anxiety and concerns of orthodontic patients regarding Covid-19 pandemic and to determine the impact of quarantine on orthodontic appointments and treatment duration. Online Questionnaire related to COVID -19 was sent to orthodontic patients. Comparisons between level of anxiety and willingness to attend orthodontic treatment and respecting quarantine were performed using independent t test, Chi square, One-way ANOVA and Tukey test. Additionally, gender-based comparisons were also made. Spearman correlation coefficient analysis was performed to investigate the relationship between age and level of anxiety. 200 patients (females 136, males 64) participants responded to the questionnaire with the age range of 18.87 ± 8.012 years. Most of the patients were respecting quarantine. Generally, (44.3%) patients were calm about the COVID-19. As compared to females, males were more willing to attend orthodontic appointment although their anxiety level was slightly higher related to the impact on orthodontic treatment. There was an insignificant association between the anxiety levels and willingness for appointments, respecting quarantine and age. Delay in orthodontic treatment duration was one of the greatest concerns shown by the patients. COVID-19 Pandemic has influenced the orthodontic treatment but also the patient's anxiety levels. Males were more anxious related to the impact of COVID-19 on orthodontic treatment. Patients willing to attend orthodontic appointments in emergency showed higher levels of anxiety. Delay in treatment duration was one of the most important concern of the patients.

Key words: COVID -19; Orthodontics; Anxiety; Precautionary measures.

This article may be cited as: Iftikhar A, Shaheed S, Jahanzed T. Impact of COVID-19 Outbreak on patients' clinical appointments, anxiety and concerns regarding orthodontic treatment. Pak Oral Dent J 2021; 41(4):205-211.

INTRODUCTION

In December 2019, there was an outbreak of atypical pneumonia reported to be caused by Coronavirus (COVID-19) in Wuhan, the capital city of Hubei Province in China.¹⁻⁴ The COVID-19 then rapidly speeded to 209 countries across the globe including Pakistan.¹ Due to its highly contagious nature and spread, World Health Organization (WHO) declared it a pandemic on 30th of January 2020.^{3,4} In Pakistan, the first case of COVID-19 was reported by the ministry of health in the city of Karachi, in February 2020. Soon, the

number of confirmed cases drastically increased with the highest numbers being reported in the province of Sindh, followed by Gilgit Baltistan.⁴ The unpredictable nature of COVID-19 pandemic has led to global and social implications. This uncertain situation has adversely affected the businesses, economy, educational institutes, public places and family life.^{3,5}

COVID -19 is a viral infection, mainly transmitted via respiratory droplets and contact transmission.² It has been reported that the patients who are in incubation period or even asymptomatic are carriers of the infective virus.³ A recent study revealed that virus can remain viable in aerosols for several hours on metal or plastic surface and skin for several days.⁶ In addition, the aerosols generated from the infected patient can spread at about a distance of 6 feet. Therefore, enclosed spaces with poor ventilation are risky.^{2,6-8}

In March 2020, Pakistan also declared lockdown and medical emergency throughout the country.⁹ The dental clinics and hospitals were also closed

¹ **Corresponding Author:** Dr Ayesha Iftikhar, Assistant Professor Department of Orthodontics, Rehman College of Dentistry, Peshawar Email: ayesha.iftikhar@rmi.edu.pk Mobile: 03008554719

² Dr Sohrab Shaheed, Professor/Head of Department of Orthodontics, Rehman College of Dentistry, Peshawar. E-mail: Sohrab.shaheed@rmi.edu.pk

³ Dr Tayyaba Jahanzeb, TMO 1st year, Orthodontics, Rehman College of Dentistry, Peshawar E-mail: tayyaba.jehanzeb@rmi.edu.pk

Received for Publication: Dec 17, 2020

Revised: Jan 14, 2021

Approved: Feb 1, 2021

due to COVID -19 pandemic. Dentists were advised to treat only the emergency cases (Trauma, abscess, or irreversible pulpitis) and defer all the elective procedures.^{6,10-12} type:"article-journal", volume:"19", uris:[http://www.mendeley.com/documents/?uuid=4b057f6c-b8b5-4313-9b7f-b08e93a1c-2d0]], {"id":"ITEM-2", itemData":{"DOI":"10.1016/j.ajodo.2020.07.005", ISSN:"08895406", abstract:"Introduction: The ongoing coronavirus disease 2019 (COVID-19) Since emergency cases in orthodontics are rarely observed, routine follow up of all the orthodontic patients was interrupted. However, dental and orthodontic clinics were allowed to operate after a few months, provided they were following the biosafety measures and precautionary guidelines proposed by the local authorities.^{3,8,12}and patients' anxiety and concerns about their ongoing orthodontic treatment. Settings and sample population: Patients from private dental clinics of two orthodontists that were undergoing active orthodontic treatment. Material and methods: An online anonymous questionnaire regarding their anxiety about the coronavirus situation, availability/acceptance to attend an appointment, among others, was answered by orthodontic patients. Descriptive statistics with percentages was performed and responses were compared between sexes, cities, and association of the feelings/level of anxiety of patients and willingness to attend an appointment were performed with chi-square, independent t test, one-way ANOVA and Tukey's tests. Results: The questionnaire was answered by 354 patients (231 female; 123 male

Lockdown and other public safety measures as observed in the current situation has resulted in many missed orthodontics appointments.^{13,14} Evidence relates missed appointments with increased appliance breakages, unfavorable inclinations of teeth and increased treatment duration.¹³ Many Orthodontic patients are anxious and concerned about attending orthodontic clinics and delay in their treatment.^{3,10,12,13}and patients' anxiety and concerns about their ongoing orthodontic treatment. Settings and sample population: Patients from private dental clinics of two orthodontists that were undergoing active orthodontic treatment. Material and methods: An online anonymous questionnaire regarding their anxiety about the coronavirus situation, availability/acceptance to attend an appointment, among others, was answered by orthodontic patients. Descriptive statistics with percentages was performed and responses were compared between sexes, cities, and association of the feelings/level of anxiety of patients and willingness to attend an appointment were performed with chi-square, independent t test, one-way ANOVA and Tukey's tests. Results: The questionnaire was answered by 354 patients (231 female; 123 male

By and large, the response to tackle the virus in public and media has primarily focused on the physical health related effects of the virus, however its effect on the mental health has not been observed that closely.^{5,15}2008, leaving substantial destruction and a number of deaths in its wake. We assessed differences in the

determinants of posttraumatic stress disorder (PTSD) Also, little is known about the anxiety of orthodontic patients related to the impact of the pandemic and social distancing on their treatment. Hence, the objective of the present study was to assess the level of anxiety and concerns of orthodontic patients regarding COVID -19 pandemic. This study also aimed to determine the perception of patients regarding the impact of quarantine on their orthodontic treatment and use of biosafety measures at orthodontic clinics. The outcome of the study will help prioritize and address anxiety concerns of the orthodontic patients in the COVID -19 pandemic and may help formulate policy guidelines for safety measures in the orthodontic clinics during the pandemic.

MATERIAL AND METHODS

The ethical approval of the study was obtained from the institutional Research Ethical Committee. Informed consent was obtained from the respondents before the start of the study. Data were collected for this cross-sectional study in the month of August,2020. The patients above 15 years of age undergoing active orthodontic treatment at RCD, Orthodontic Department, were included who could read and fill the questionnaires. Pre-validated questionnaire by³ was used for the study. The Microsoft Forms questionnaire survey link was sent to the patients on WhatsApp Messenger App. The questionnaire was available for 72 hours. The patients answered various questions about age, gender, city, education, duration of treatment. Anxiety levels related to COVID -19 pandemic and impact on their orthodontic treatment were assessed using numerical rating scale (NRS), 0 being no anxiety and 10 extreme anxieties.³

Statistical analysis was performed using IBM SPSS Statistics v.20 (Chicago, Ill). Levene's test was used to determine the normality of the numeric data. Chi square tests were performed to determine any difference in the general feeling/ regarding COVID-19 among the categories of willingness to attend orthodontic treatment. To determine any difference in the reported anxiety related to corona pandemic among the response categories of respecting quarantine and its impact on orthodontic appointment one-way ANOVA and Tukey test were used. Spearman rank correlation coefficient was performed for age and level of anxiety in Pandemic situation and its effect on the orthodontic treatment. P value ≤ 0.05 was considered significant.

RESULTS

200 patients responded to the questionnaire. Response rate was 80%. Out of total respondents, 136 (68 %) patients were females and 64 (32%) were males. Mean age was 18.87 ± 8.012 years. In terms of treatment duration, majority of the patients (50.5%) in our study were under orthodontic treatment since past one year or less. The mean anxiety level due to corona pandemic was 3.67 ± 2.80 . And the mean anxiety level regarding the impact of corona pandemic and

quarantine in orthodontic treatment was 4.58 ± 3.11 . Descriptive statistics of responses are shown in (Figure 1,2,3,4,5)

Gender comparisons of the responses are given in. (Table 1) Both genders were respecting quarantine meticulously by staying at home and only leaving home for food or medicine (65.9% vs 75.6% for males). Similarly, both genders preferred studying or working from home (69.6% vs 71.8% for males). Although, males were generally feeling calm as compared to females regarding the corona pandemic. Willingness to attend orthodontic appointment was more as compared to female (75% vs 69.9% for females). The level of anxiety and impact of pandemic on orthodontic treatment was slightly higher in male patients (4.67 ± 3.01). However, the difference was statistically not significant ($p=0.76$). Males were more concerned regarding delay their orthodontic treatment. (58.7% vs 50.57 % for females) Females were more anxious, panicked, and fearful of the pandemic as compared to males. Patients who reported to be calm (39%) were more willing to go for the orthodontic appointment than anxious, fearful, and indifferent ones. Patients who were willing to go for orthodontic appointment only in case of emergency showed increased scores for anxiety levels (5.16 ± 2.60) compared to the ones who would not go (3.55 ± 3.90) or would go for any appointment (4.48 ± 3.20). (Table 2) The patients, who were meticulously respecting quarantine, presented with higher level of anxiety (3.89 ± 2.70) however, this difference was statistically insignificant ($p = 0.58$). The anxiety levels related to impact on orthodontic treatment was more (5.41 ± 3.27) in patients who were respecting quarantine and leaving home only when it was necessary ($p=0.25$). (Table 3) Insignificant correlations were found between age of the patient ($r = - 0.007$), (p -value = 0.92) and the level of anxiety and its impact on the orthodontic treatment ($r = - 0.035$, p -value = 0.62). (Table 4)

DISCUSSION

This study intended to determine the levels of anxiety, concerns and attitudes of patients during COVID-19 pandemic. It also evaluated the perceptions

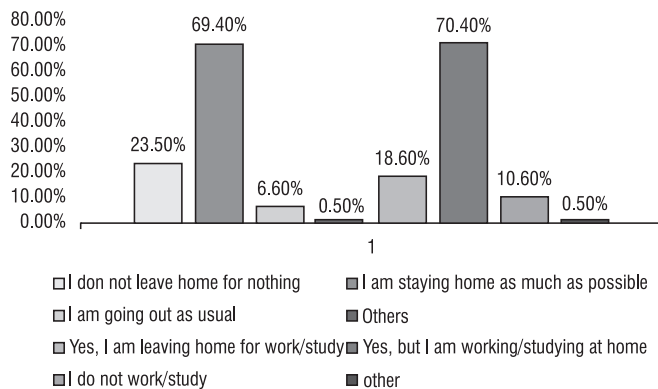


Fig 1: Percentage of patients respecting quarantine by staying and working from home.

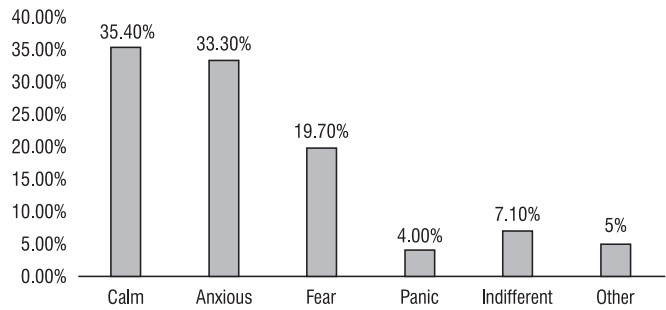


Fig 2: General anxiety levels related to corona pandemic.

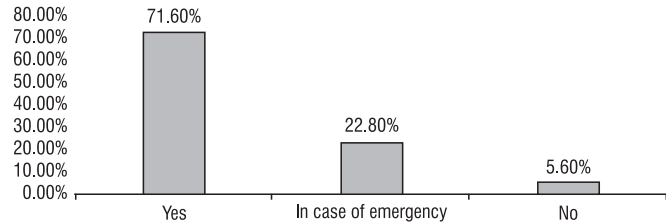


Fig 3: Willingness of patients to attend orthodontic appointments

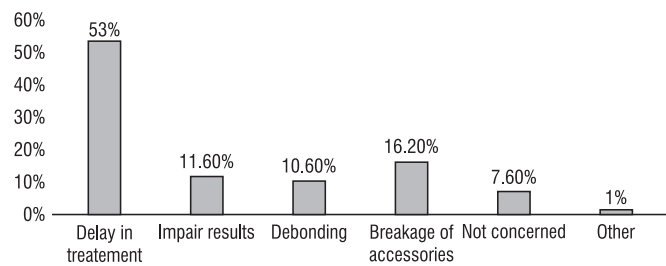


Fig 4: Impact of Covid-19 on orthodontic treatment

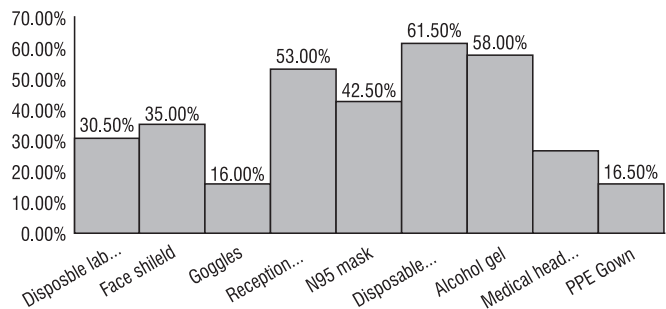


Fig 5: Responses of the questionnaire item "Preferences of orthodontic patient's precautionary measures in the orthodontic clinic"

of the patients regarding the effect of corona pandemic on orthodontic treatment and the biosafety measures that should be followed in orthodontic clinics.

Pre-validated questionnaire from the study conducted by Cotrin et al was used for survey.³ The literature reports many surveys related to corona pandemic. This questionnaire was chosen because it included all the variables that addressed the objective of our study.

Most of the patients were respecting quarantine by working and staying at home. However, anxiety levels

TABLE 1: RESULTS OF COMPARISON BETWEEN MALES AND FEMALES

| Questions | Female N=96 | Male N =37 | p |
|---|-------------|-------------|--------|
| | N % | N % | |
| How are you respecting the quarantine? | 196 | (132) | (64) |
| Do not leave home | 38 (28.7%) | 8 (12.5%) | P=0.33 |
| Stay home as possible | 87 (65.9%) | 49(75.62%) | |
| Going out as usual | 6 (4.5%) | 7(10.9%) | |
| Other | 1(0.7%) | 0 (0%) | |
| General Feeling about corona pandemic | 198 | (135) | (63) |
| Calm | 44(32.5%) | 26 (41.2%) | 0.483 |
| Anxious | 43(31.8%) | 23 (36.50%) | |
| Fear | 30(22.2%) | 9(14.2%) | |
| Panic | 7 (5.1%) | 1 (1.58%) | |
| Indifferent | 10(7.4%) | 4(6.3%) | |
| Other | 1(0.7%) | 0 (0%) | |
| Willingness to attend Orthodontic appointment | 199 | (133) | (64) |
| Yes | 93 (69.9%) | 48 (75%) | 0.016 |
| Incase of emergency | 36(27.06%) | 9 (14.06%) | |
| No | 4 (3.00%) | 7 (10.09%) | |
| Impact on orthodontic treatment | 198 | (135) | (63) |
| Delay treatment | 68 (50.37%) | 37 (58.7%) | 0.702 |
| Impair final result | 17 (12.59%) | 6 (9.5%) | |
| Worsen result Debonding | 16 (11.8%) | 5 (7.9%) | |
| Breakage of accessories causing discomfort | 24 (17.7 %) | 8 (12.6%) | |
| I am not concerned | 9 (6.66%) | 6 (9.5%) | |
| Other | 1 (0.7%) | 1 (1.58%) | |
| Do you work or study? | 199 | (135) | (64) |
| Yes, leaving home for study | 23 (17%) | 14 (21.8%) | 0.439 |
| Yes, but I am working studying at home | 94 (69.6%) | 46 (71.8%) | |
| I donot work study | 17 (12.5%) | 4 (6.25%) | |
| Other | 1 (0.7%) | 0 (0%) | |
| Anxiety related to corona pandemic and orthodontics | 200 | (136) | (64) |
| | 4.54 (3.16) | 4.67(3.01) | 0.76 |
| General Anxiety related to corona pandemic | | | |
| | 3.57 (2.78) | 3.88 (2.86) | 0.48 |

Chi square test

Independent T test

P =<0.05*

of the patients and its impact on orthodontic treatment was the highest for the ones who were respecting quarantine. This is in accordance with Cotrin et al who reported highest anxiety levels for the patients who were meticulously respecting quarantine.³This anxiety level can be related to the large amount of daily updates and material received from the news on TV and internet.^{3,16}

Huang Y et al also reported high prevalence of anxiety related to corona pandemic in a survey conducted in china.¹⁶ Anzar et al suggested that the misinformation on various plat forms on social media can lead to serious public health issues like general anxiety disorder and sleep deprivation and depression.¹⁷

Similarly, patients who were willing to go for an

TABLE 2: RESULTS OF THE COMPARISON OF THE WILLINGNESS TO ATTEND ORTHODONTIC APPOINTMENT AND T FEELING/ LEVEL OF ANXIETY ABOUT COVID -19

| | Orthodontic appointment during the quarantine | | | P value |
|---|---|---|-----------------------|-----------|
| | Yes N (%) 141 | In case of urgency / emergency N (%) 44 | No N (%) 10 | |
| Calm | 55 (39%) | 11 (25%) | 4 (40%) | 0.543, ** |
| Anxious | 47 (37%) | 17 (38.6%) | 1 (10%) | |
| fear | 23 (16.31%) | 10 (22.7%) | 4 (40%) | |
| panic | 5 (3.5%) | 3 (6.8%) | 0 (0%) | |
| Indifferent | 10 (7.09%) | 3 (6.8%) | 1 (10%) | |
| Other | 1 (0.7%) | 0 (0%) | 0 (0%) | |
| Anxiety level/ impact orthodontic treatment | Mean (SD) 4.48(3.20) | Mean (SD) 5.16 (2.60) | Mean (SD) 3.55(3.90) | 0.239, † |
| Anxiety Level / coronavirus pandemic | Mean (SD) 3.50 (2.81) | Mean (SD) 4.42(2.58) | Mean (SD) 3.66 (2.83) | 0.83, † |

**Chi square test

† One-way ANOVA test

P =<0.05*

TABLE 3: RESULTS OF THE COMPARISON OF THE RESPECTING QUARANTINE AND THE ANXIETY ABOUT THE COVID 19 PANDEMIC / IMPACT ON ORTHODONTIC TREATMENT (ONE-WAY ANOVA AND TUKEY TESTS)

| Levels of anxiety | Donot leave home | Stay Home as much as possible | Go out normally | P value |
|---|----------------------|-------------------------------|-----------------------|---------|
| Anxiety level/ impact orthodontic treatment | Mean (SD) 5.41(3.27) | Mean (SD) 4.49(2.93) | Mean (SD) 3.00 (3.44) | 0.25 |
| Anxiety Level / coronavirus pandemic | Mean (SD) 3.70(2.98) | Mean (SD) 3.89(2.70) | Mean (SD) 1.62 (2.48) | 0.58 |

P=<0.05*

TABLE 4: RESULTS OF THE CORRELATIONS BETWEEN AGE OF THE PATIENTS AND LEVELS OF ANXIETY ABOUT COVID 19 PANDEMIC / IMPACT ON ORTHODONTIC TREATMENT (PEARSON'S CORRELATION COEFFICIENT)

| Correlation | r | p |
|---|--------|------|
| Age +level of anxiety /corona | -0.007 | 0.92 |
| Age level of anxiety/ Impact on orthodontic treatment | -0.035 | 0.62 |

orthodontic appointment were mostly calm. The ones who only wanted emergency appointments were found to be the most anxious. This is in contrast to another study where anxiety levels were higher for the ones who were not willing to attend any appointment.^{3,11}

Average Anxiety levels related to corona pandemic in our study was 3.67, showing patients were generally calm. However, few showed anxiety related to the COVID- 19. These results reveal that patients not only understood the sensitivity and seriousness related to the pandemic situation, but they were also aware of

the basic knowledge about COVID -19. Akhtar Ali et al reported 74% level of awareness regarding COVID -19 pandemic, its basic knowledge and outbreak from participants in Sindh, Pakistan. They were also found to be well satisfied with the measures taken by the Government.¹⁸ Cotrin et al revealed average level of anxiety to be 5 that was higher than our study.

This difference in anxiety levels can be attributed to the regional differences in spread of the pandemic such as the number of cases and deaths.³

In our study most of the respondents were females and they were more fearful and panicked about corona pandemic in comparison to males who were mostly calm. Literature also reports more mental distress in females that might be related to their biological nature, so they prioritize physical health over esthetics. Moreover, they prefer staying at home to avoid mental distress.^{3,10}and patients' anxiety and concerns about their ongoing orthodontic treatment. Settings and sample population: Patients from private dental clinics of two orthodontists that were undergoing active orthodontic treatment. Material and methods: An online anonymous questionnaire regarding their

anxiety about the coronavirus situation, availability/acceptance to attend an appointment, among others, was answered by orthodontic patients. Descriptive statistics with percentages was performed and responses were compared between sexes, cities, and association of the feelings/level of anxiety of patients and willingness to attend an appointment were performed with chi-square, independent t test, one-way ANOVA and Tukey's tests. Results: The questionnaire was answered by 354 patients (231 female; 123 male

There was a negative correlation found between age of the patient and anxiety levels. A recent study revealed absence of any correlation.³ It was probably because the survey was conducted during the early quarantine days when the levels of anxiety were comparatively low.³ Though, Huang Y et al revealed greater levels of anxiety among young population than the adults.¹⁶

In our study most of the patient were concerned about delay in their treatment followed by breakage of accessories that could cause discomfort. When this survey was conducted, all the dental services were suspended for long period of time and few clinics were allowed to provide emergency services. Previous studies report missed appointments can cause increase in total treatment duration that can lead to mental distress in orthodontic patients. Roy et al et al in their study also confirms that 63.3 % of the patients were worried about extended treatment time.¹³ Concern about delay in their orthodontic was observed slightly more in males' patients. These results are in accordance with previous studies, males were more concerned about delay in their treatment and were slightly more willing to attend the orthodontic clinic.³

As for the precautionary measures the respondents considered multiple options important such as facemask, alcohol gel, avoiding crossing over at reception, N95, Face shield ,PPE gown, medical head cap. This shows that the patients are well aware of all the measures that should be taken to avoid contamination and cross infection during appointments. This is in agreement with Turkistani et al who reported that in clinical area strict infection control measures should be taken to avoid aerosol production and cross infection.¹² Affecting more than 200 countries and territories. The infection is highly contagious, with disease transmission reported from asymptomatic carriers, including children. It spreads through person-to-person contact via aerosol and droplets. The practice of social distancing—maintaining a distance of 1-2 m or 6 ft—between people has been recommended widely to slow or halt the spread. In orthodontics, this distance is difficult to maintain, which places orthodontists at a high risk of acquiring and transmitting the infection. The objective of this review is to report to orthodontists on the emergence, epidemiology, risks, and precautions during the disease crisis. This review should help increase awareness, reinforce infection control, and prevent cross-transmission within the orthodontic facility. Methods: A comprehensive literature review

of English and non-English articles was performed in March 2020 using COVID-19 Open Research Dataset (CORD-19 2020 These measures help build confidence between orthodontist and the patient.³ Patients concern of prolonged treatment should be considered as utmost important by the orthodontists. Various Measures can be considered such as, Selection of orthodontic wires, appliances and efficient biomechanics that will not affect treatment efficacy in case of missed appointments.^{3,19} Patients should be guided and reassured that orthodontic treatment does not have any emergency. Any problem can be solved by better communication and virtual assistance with the orthodontist.^{11,12} affecting more than 200 countries and territories. The infection is highly contagious, with disease transmission reported from asymptomatic carriers, including children. It spreads through person-to-person contact via aerosol and droplets. The practice of social distancing—maintaining a distance of 1-2 m or 6 ft—between people has been recommended widely to slow or halt the spread. In orthodontics, this distance is difficult to maintain, which places orthodontists at a high risk of acquiring and transmitting the infection. The objective of this review is to report to orthodontists on the emergence, epidemiology, risks, and precautions during the disease crisis. This review should help increase awareness, reinforce infection control, and prevent cross-transmission within the orthodontic facility. Methods: A comprehensive literature review of English and non-English articles was performed in March 2020 using COVID-19 Open Research Dataset (CORD-19 2020

In literature the doctor and patient relationship are one of the profound factors responsible for patient satisfaction.³ In the current situation communication plays a key role to reduce the stress level. Several modalities can be used 24/7 e.g (emails, texting, WhatsApp, phone calls and video calls etc) . Recently, Teledentistry and teleorthodontics has emerged and is playing a key role for direct and effective communication by providing orthodontic care, treatment and advice using technology. It has also helped in reducing anxiety levels in orthodontic patients.^{3,10,20} and patients' anxiety and concerns about their ongoing orthodontic treatment. Settings and sample population: Patients from private dental clinics of two orthodontists that were undergoing active orthodontic treatment. Material and methods: An online anonymous questionnaire regarding their anxiety about the coronavirus situation, availability/acceptance to attend an appointment, among others, was answered by orthodontic patients. Descriptive statistics with percentages was performed and responses were compared between sexes, cities, and association of the feelings/level of anxiety of patients and willingness to attend an appointment were performed with chi-square, independent t test, one-way ANOVA and Tukey's tests. Results: The questionnaire was answered by 354 patients (231 female; 123 male These factors should be further investigated in future research studies. Future studies should also consider the effects of socioeconomic status of the patients on

the level of anxiety and concerns of orthodontic patients regarding COVID -19 pandemic.

The limitations of our study were that the authors did not have a direct contact with the participants of the study at the time the respondents filled the questionnaire. This could have introduced a bias in the data reporting of the study.

CONCLUSION

The Lockdown suggested during COVID- 19 Pandemic had an impact on orthodontic appointments as well as the anxiety levels of patients. Patients who were willing to attend orthodontic clinics in case of emergency presented with significantly greater levels of anxiety as compared to the ones who were not willing for the appointments. Females were more fearful and panicked about corona pandemic. Males were slightly more anxious and concerned about the impact of corona pandemic on orthodontic appointments. Delay in treatment duration was one of the most important concern following breakage of an accessory causing discomfort.

REFERENCES

- Waris A, Atta UK, Ali M, Asmat A, Baset A. COVID-19 outbreak: current scenario of Pakistan. *New Microbes New Infect.* 2020;35(20):100681. Available at: <https://doi.org/10.1016/j.nmni.2020.100681>.
- Naqvi K, Mubeen SM, Shah SMA. Challenges in providing oral and dental health services in COVID-19 pandemic. *J Pak Med Assoc.* 2020;70(5):S113–17.
- Cotrin P, Peloso RM, Oliveira RC, de Oliveira RCG, Pini NIP et al. Impact of coronavirus pandemic in appointments and anxiety/concerns of patients regarding orthodontic treatment. *Orthod Craniofac Res.* 2020 Nov;23(4):455-461. doi: 10.1111/ocr.12395.
- Abid K, Bari YA, Younas M, Tahir Javaid S, Imran A. Progress of COVID-19 Epidemic in Pakistan. *Asia-Pacific J. Public Heal.* 2020;32(4):154–56.
- Ornell F, Schuch JB, Sordi AO, Kessler FHP. “Pandemic fear” and COVID-19: Mental health burden and strategies. *Brazilian J. Psychiatry* 2020;42(3):232–35.
- Q. Akhtar, K. Mahmood, U. Qayyum NAR. Impact of Covid -19 on Utilization of dental services by patients visiting tertiary care dental centre lahore. *Pak Armed Forces Med Jak Armed Forces Med J* 2020;19(April):560–64.
- Setti L, Passarini F, De Gennaro G, Barbieri P, Perrone MG, Borelli M, Palmisani J, Di Gilio A, Piscitelli P, Miani A. Airborne Transmission Route of COVID-19: Why 2 Meters/6 Feet of Inter-Personal Distance Could Not Be Enough. *Int J Environ Res Public Health.* 2020 Apr 23;17(8):2932. doi: 10.3390/ijerph17082932.
- Raja HZ, Saleem MN, Shabbir A, Mumtaz M. cross infection control awareness of pakistani dentists for COVID-19 pandemic. 2020;40(3):123–29.
- Qazi SR, Rehman N, Nasir S. Practice Guidelines Addressing Needs of Pakistani Dentists During the COVID-19 Pandemic Part 1: Needs Assessment. *J Pakistan Dent Assoc.* 2020;29(Special Supplement):7–13.
- Xiong X, Wu Y, Fang X, Sun W, Ding Q, Yi Y, Huang Y, Gong J, Liu J, Wang J. Mental distress in orthodontic patients during the coronavirus disease 2019 pandemic. *Am J Orthod Dentofac Orthop.* 2020;158(6):824-833.e1. doi: 10.1016/j.ajodo.2020.07.005.
- Caprioglio A, Pizzetti GB, Zecca PA, Fastuca R, Maino G, Nanda R. Management of orthodontic emergencies during 2019-NCOV. *Prog Orthod.* 2020 7;21(1):10. doi: 10.1186/s40510-020-00310-y.
- Turkistani KA. Precautions and recommendations for orthodontic settings during the COVID-19 outbreak: A review. *Am J Orthod Dentofac Orthop.* 2020;158(2):175–81. Available at: <https://doi.org/10.1016/j.ajodo.2020.04.016>.
- Roy J, Dempster LJ. Dental anxiety associated with orthodontic care: Prevalence and contributing factors. *Semin Orthod.* 2018;24(2):233–41. Available at: <https://doi.org/10.1053/j.sodo.2018.04.005>.
- Faruqui S, Fida M, Shaikh A. Factors Affecting Treatment Duration - A Dilemma In Orthodontics. *J Ayub Med Coll. Abbottabad* 2018;30(1):16–21.
- Tracy M, Norris FH, Galea S. Differences in the determinants of posttraumatic stress disorder and depression after a mass traumatic event. *Depress Anxiety* 2011;28(8):666–75.
- Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Res.* 2020 Jun;288:112954. doi: 10.1016/j.psychres.2020.112954.
- Anzar W, Ali Baig Q, Afaq A, Bin Taheer T, Amar Abstract S. Impact of Infodemics on Generalized Anxiety Disorder, Sleep Quality and Depressive Symptoms among Pakistani Social Media Users during Epidemics of COVID-19 *1. *Merit Res J Med Sci.* 2020;8(3):69–073. Available <http://www.meritresearchjournals.org/mms/index.htm>.
- Ali A. Awareness, Attitude and Practices Related to COVID-19 Pandemic in General Public of Province Sindh, Pakistan. *Pakistan J Med Dent.* 2020;9(03):90–95.
- Tochigi K, Saze N, Arai K. Impact of passive self-ligation and conventional elastic ligation on orthodontic force in the simulation of a mandibular lateral incisor linguoversion. *Am J Orthod Dentofac Orthop.* 157(3):320–8. Available at: <https://doi.org/10.1016/j.ajodo.2019.03.029>.
- Cotrin P, Peloso RM, Pini NIP, et al. Urgencies and emergencies in orthodontics during the coronavirus disease 2019 pandemic: Brazilian orthodontists' experience. *Am J Orthod Dentofac Orthop.* 2020:1–7. Available at: <https://doi.org/10.1016/j.ajodo.2020.06.028>.

CONTRIBUTIONS BY AUTHORS

1 Ayesha Iftikhar:

Wrote the article

2 Sohrab Shaheed:

Supervised research & proof checked

3 Tayyaba Jahanzeb:

Data Collected & analysed