

The Impact of COVID-19 on Orthodontic Practitioners and their Practice in Pakistan

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Abstract: Background: The Coronavirus pandemic is an ongoing coronavirus disease epidemic that had a profound effect on the healthcare system. When the epidemic first spread widely in Pakistan in March 2020, many dental offices went on an emergency-only closure schedule. Changes were evident even after they reopened.

Objective: Primary objectives were to ascertain the consequences of COVID-19 pandemic on Orthodontic practitioners and their practice in Pakistan; how their psychological and financial well-being was affected, and to bring light to the perception of Orthodontists regarding the impact of the COVID-19 pandemic on future of Orthodontists. Secondary objectives were to see if there was any difference in impact between male and female participants and Orthodontic Consultants and Orthodontic Residents.

Materials and Methods: This cross-sectional study was conducted among the Orthodontic community of Pakistan. It included 183 participants which comprised 41 Orthodontists and 142 Orthodontic Residents. A self-administered online questionnaire (Google forms) was circulated. Chi-square test was used to compare qualitative variables. P value less than or equal to 0.05 was considered significant.

Results: This study showed that 80% of the participants stopped their Orthodontic practice during the lockdown period. The majority of the practitioners had a negative impact on their psychological well-being. A significant difference was noted between male and female professionals' responses ($p=0.021$). Most of the residents reported having a negative impact on their training as well.

Conclusion: The need for more training programs for infection control cannot be emphasized enough to prevent all the adverse effects caused by such outbreaks.

Keywords: COVID-19, Orthodontists, Impact, Well-being, Practice, Infection.

INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease that spread like wildfire around the world. Initially, the virus that caused it was called the novel coronavirus 2019-nCoV, but it was later identified by the International Committee on Virus Taxonomy as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. Starting in the city of Wuhan, China, in December 2019 as pneumonia of unknown cause, no country was left unaffected within the next few months. Pakistan, a neighboring country of China, reported its first symptomatic COVID-19 case in Karachi on February, 26th 2020. World Health Organization declared Coronavirus disease as a pandemic in the following month. Most of the patients affected by it had mild to moderate symptoms but some battled with the disease for their lives. Infected by the disease or not, people around the globe were overwhelmed by it.

COVID-19, a pandemic affecting all professions and lives worldwide, has affected health professionals in many ways [2]. The dental profession was labeled a 'high to very high-

risk health care occupation for the spread of COVID-19' by the World Health Organization (WHO) due to aerosol production and for having an operational site in the patient's oropharyngeal region [3]. This led to the establishment of guidelines and policies by the health authorities that should be followed to minimize the spread of the disease and ensure safe and effective healthcare delivery. Pakistan, being a third-world country, had to undergo a lot of difficulties and had to face several challenges in controlling the spread of the disease as mentioned by Khalid *et al.* in their study [4]. A nationwide lockdown to control the transmission of the disease halted elective/routine procedures of all health professions, including dentistry. Even after the lockdown subsided, dental professionals were required to maximize their personal protective equipment during treatment [5].

Social distancing, i.e., maintaining a distance of 1-2 meters between individuals, was widely advised to slow the spread of disease and minimize its adverse effects. In Orthodontics, it is difficult to practice social distancing placing Orthodontic practitioners at a high risk of acquiring and transmitting the disease. Orthodontists treat several patients in a single day. This makes strict infection control for highly transmissible viruses an area of concern. Children are the vast majority of their patients who were reported to be asymptomatic but infected with COVID-19 [6].

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There were a lot of surveys that reported high levels of stress, fatigue, and depression among healthcare professionals. As we live with all the modifications made in our lives by the COVID-19 pandemic, we need to understand the impact of COVID-19 on Orthodontic practitioners, their practice, and their perception of the future of orthodontic practice, especially concerning infection control. We need to understand the vulnerability of Orthodontic practitioners, just like other healthcare professionals due to the pandemic. Various research articles determining the impact of COVID-19 on dental professionals and dentistry are readily available [7, 8]. Studies on the impact of the COVID-19 pandemic on orthodontic patients and their treatments are also available but very few studies are available on its ramifications on orthodontists and their practices [9-13].

Hence, the purpose of this study is to evaluate the impact of COVID-19 on the well-being of Orthodontic practitioners and their Orthodontic practice. It will also highlight if there was any difference in the impact of COVID-19 on female and male practitioners, and Orthodontic Consultants and Orthodontic Residents.

MATERIALS AND METHODS

A cross-sectional study was conducted for which ethical approval was taken before conducting the study by the Ethical Review Committee of the Margalla Institute of Health Sciences in Rawalpindi, Pakistan. The minimum sample size required was 175 participants (30 Orthodontists and 145 Orthodontic Residents). The inclusion criteria included Orthodontists and orthodontic residents that worked, in a clinic or hospital setting, before the start of the spread of Coronavirus disease in Pakistan (employed before March 2020).

The study was carried out over a period of eleven months from Jan-22 to Nov-22. A self-administered questionnaire was made which contained a total of thirteen questions among which three were about the participant's demographic details and the remaining ten covered details about the way participants responded to the COVID-19 pandemic in 2020. Questions related to the impact on Orthodontic professionals were given the options of very, moderately and not at all. Informed consent was taken before the beginning of the questionnaire. The questionnaire was face validated by Orthodontic Consultants at the Margalla Institute of Health Sciences using the method mentioned by Bahri Yusoff *et al.* [14]. The questionnaire was disseminated using Google Docs link via different social media platforms (WhatsApp, Facebook, and Instagram) through a consecutive sampling technique among Pakistani Orthodontic practitioners (Table 1).

In this study, the term Orthodontic practitioner describes a Consultant Orthodontist or any Orthodontic Resident undergoing or has undergone a College of Physicians and Surgeons Pakistan (CPSP) recognized orthodontic training program. The term nationwide lockdown was used for a time period in which elective/routine orthodontic procedures were stopped; starting end of March 2020. Orthodontic practice encompassed three domains;

the number of orthodontic patients being treated, infection control protocols that were being followed by practitioners, and the training program that an Orthodontic Resident was enrolled in. The participants were included on the basis that Orthodontists and Orthodontic residents that were employed, in a clinic or hospital setting, during the spread of Coronavirus disease in our country.

Table 1. Questions Included in the Questionnaire.

1.	If you are an Orthodontist or an Orthodontic Resident?
2.	Age
3.	Gender
4.	Did you stop your orthodontic practice during the pandemic?
5.	For how long did you stop your orthodontic practice?
6.	Did you change the way you practice orthodontics due to COVID-19?
7.	Did the COVID-19 pandemic affect you financially?
8.	Did COVID-19 have a negative impact on your psychological well-being?
9.	If you are an Orthodontic resident, did COVID-19 have a negative impact on your training program?
10.	Did COVID-19 have a negative effect on your patient flow?
11.	Did your patients end their orthodontic treatment due to the pandemic?
12.	Do you think COVID-19 will permanently change the way you practice orthodontics?
13.	Do you think it will affect the viability of Orthodontics as a profession?

STATISTICAL ANALYSIS

The Statistical Package for Social Sciences (SPSS) version 26.0 was used for data analysis. Descriptive statistics were calculated for all qualitative variables. Qualitative variables were measured in terms of frequency and percentage. The chi-square test was used to compare qualitative variables with a level of significance set at 0.05 (P value ≤ 0.05) was considered significant. Cronbach's alpha was used to gauge the questionnaire's internal consistency, and a minimum value of 0.6 was established as an acceptable threshold for reliability.

P value less than or equal to 0.05 was considered significant.

RESULTS

Overall, 184 Orthodontic practitioners filled out the survey, among which one did not give consent and thus only 183 responses were included in the study results. Out of 183 participants, 22.4% were Orthodontic consultants and 77.6% were Orthodontic residents. The mean age group varied, with a total of 92.3% falling under the 40 years category, among which 66.7%

were 21-30 years old and only 1.1% were above 50 years of age. The Cronbach alpha score for the research questionnaire was recorded as 0.656, indicating the degree of reliability of this questionnaire.

Our results showed that 77.6% of the participants stopped their Orthodontic practice during the pandemic, out of which 26.8% did it for less than a month, 45.0% closed their practice for 1-3 months, while 28.2 % stopped seeing Orthodontic patients for over 3 months (Table 2). There was an insignificant difference (p=0.65) between male and female respondents to this question.

Table 2. Time Duration for which Male and Female Participants Stopped their Orthodontic Practice during COVID-19 Pandemic.

		Gender		Total
		Male	Female	
For how long did you stop your orthodontic practice?	<1month	11 (31.4%)	27 (25.2%)	38 (26.8%)
	1-3 months	16 (45.7%)	48 (44.9%)	64 (45.1%)
	3+ months	8 (22.8%)	32 (29.9%)	40 (28.2%)
Total		35	107	142

The majority of the participants, i.e., 88%, agreed that they changed their way of Orthodontic practice (Fig. 1). Concerning the financial impact of COVID-19, a total of 65.0% were negatively affected. 55.4% of the Orthodontic practitioners reported that they were moderately affected. 40.4% of the female practitioners reported to have no financial impact due to COVID-19 whereas the male practitioners to have claimed

the same was only 19.1% which was a significant difference (p=0.009). Among all, the psychological well-being of 77.6% of respondents was affected negatively. Just like the results of negative financial impact, 55.4% were moderately affected but almost 22.4% proclaimed to have a very significant effect on their psychological well-being.

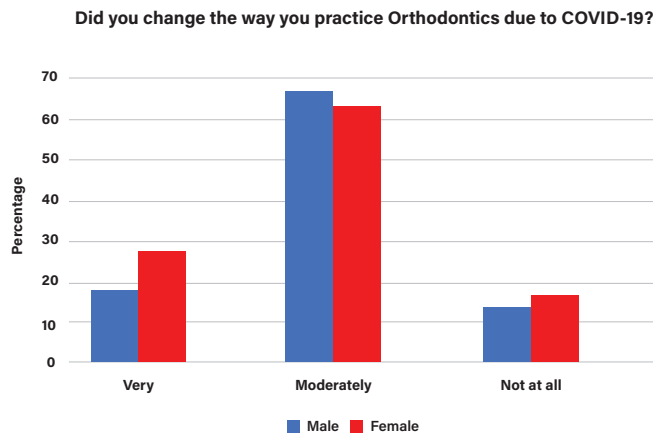


Fig. (1). Represents the Percentage of Participants that Changed the Way they Practiced Orthodontics due to COVID-19.

In contrast to the results of financial impact, a greater number of female practitioners, almost 81.6%, compared to 66.0% of male practitioners were psychologically affected, but this was statistically insignificant (p=0.083).

When Orthodontic residents were asked if COVID -19 had any ramifications on their training programs, out of 144 residents, 93.1% agreed on having a negative impact. 45.1% reported to have their training significantly affected out of which 50.0% were females and only 25.0% were males which was significant statistically (p=0.021) (Table 3). Moreover, practitioners noticed

Table 3. Statistical Difference between Responses of Male and Female Practitioners.

Variables	P value
Did you stop your orthodontic practice during the pandemic?	0.551
For how long did you stop your orthodontic practice?	0.655
Did you change the way you practice orthodontics due to COVID-19?	0.488
Did the COVID-19 pandemic affect you financially?	0.009*
Did COVID-19 have a negative impact on your psychological well-being?	0.083
If you are an Orthodontic resident, did COVID-19 have a negative impact on your training program?	0.021*
Did COVID-19 have a negative effect on your patient flow?	0.142
Did your patients end their orthodontic treatment due to the pandemic?	0.837
Do you think COVID-19 will permanently change the way you practice orthodontics?	0.007*
Do you think it will affect the viability of Orthodontics as a profession?	0.033*

* Significant P value (P < 0.05), P values were generated using the chi-square test.

that the patient flow was also affected during the time period of COVID-19. It did not come as a surprise that 69.4% agreed that a variable number of Orthodontic patients stopped their treatment altogether among which only 10.9% reported that it was a significantly large number. Although 9.2% of the practitioners

noticed there was no reduction in their patient flow but 30.6% of the practitioners claimed to have hardly any patients who stopped their ongoing treatment.

Our study ascertained that only 20.2 % of the participants were

of the view that the pandemic will permanently affect their way of practicing Orthodontics in times ahead. There was a significant difference ($p=0.021$) between the response of Orthodontists and Orthodontic residents when asked if they will modify their methods of Orthodontic practice. When asked if Coronavirus disease would affect the future of Orthodontics as a profession, 45.4% disagreed with it and only 12.6% agreed. The responses to this question had a significant difference ($p=0.033$) between the male and female participants, where females had more positive or indecisive responses compared to the male participants who mostly disagreed to it.

DISCUSSION

COVID-19 has had a major impact on the successful delivery of dental care worldwide as the dental profession struggled to develop care systems and enact standard protocols during this time. Disturbances have incorporated diminished in-person dental visits, delays in diagnosis and treatment time and changes in the way patients are treated and diagnosed, but these effects extend beyond the process-related ramifications. Moreover, the Orthodontic profession has been hit hard; the mental, emotional, and financial impact of the widespread COVID-19 pandemic on Orthodontic practitioners is only now being understood. To understand these effects, it is significant to know the perspective of Orthodontic practitioners as they are in the best position to describe these.

The findings of this study are very informative and in-line with the objectives of this study. Like the previous study of Dhanasekaran *et al.* [12], which showed that 80.0% of Orthodontists stopped their practice during the pandemic, our study showed almost the same result i.e., 77.2%. Our study also showed 65.0% of the Orthodontic practitioners were economically affected which was close to the results of Isiekwe *et al.* [15]. The negative impact on the financial well-being and the training of residents may be the reason for a large number of respondents having a negative psychological impact. As mentioned by previous studies [15], a small number of health workers even went through depression due to the pandemic. As far as the post-pandemic viability of Orthodontics as a profession is concerned, 12.6% of those who participated in our study believed that it would be affected while the majority of the participants were of the opinion that it will remain unchanged. These figures were parallel to those from Isiekwe's study.

Unlike the previous study of Isiekwe *et al.* [15] which showed that 78.1% of Orthodontists hoped that they would permanently alter their ways of practicing Orthodontics, however the current study reported only 20.2% of the Orthodontists in Pakistan felt this way. This contrast might have occurred due to the difference in time when the research was conducted. As Isiekwe *et al.* conducted their study right after the COVID-19 outbreak, people had been significantly affected psychologically compared to a year later when we conducted our study. This delay in conducting our study was a limitation as it led to a memory bias [15].

During the time of quarantine, many orthodontists and patients communicated by smartphones or online telemedicine services [16, 17]. This was not enough in cases like loose bracket, wire impingement etc. Orthodontists had to prioritize the needs of their patients. Being the first in line to be affected by infections, and dealing with negative psychological and financial impacts cannot be an easy place to be in.

Many waves of the pandemic caused by different variants of the COVID-19 virus have occurred to date. Different methods have been proposed to avoid the emerging COVID-19 waves [18]. Despite the vast data showing mental and financial effects of COVID-19 on people, we seem to have become incredibly resilient to it, with rapid recovery from the COVID-19 standard protocols [19]. Pandemic fatigue has been noticed around the globe in regard to observing safety protocols [20].

COVID-19, to date, is affecting the lives of many individuals. Due to the irresponsible attitude of some individuals towards the infection, others had to undergo the adverse effects. Adjustments ought to be made to minimize the negative impact on Orthodontic practitioners for their well-being and better patient care in a post-pandemic world.

CONCLUSION

There is a need to conduct educational training programs for Orthodontic practitioners and their staff to control the spread of infection. This will help in preventing negative repercussions on the well-being of Orthodontic practitioners during the time of the COVID-19 crisis.

AUTHORS' CONTRIBUTION

- **Yusra Shaukat:** Conception and design of the study, Manuscript writing.
- **Um-e-Ayman:** Manuscript writing and Data entry.
- **Afeef Umar Zia:** Editing and Final reviewing of the manuscript.
- **Hafiz Muhammad Talha Arshad:** Data collection and Statistical analysis.

CONFLICT OF INTEREST

Declared none.

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