

Impact of COVID-19 Lockdown on Patients Undergoing Orthodontic Treatment: A Survey Based Study

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ABSTRACT

OBJECTIVE: To evaluate how the COVID-19 lockdown influenced patients receiving orthodontic therapy. **METHODOLOGY:** An Ambispective study was done by collecting the data from July to August 2022. An investigative questionnaire containing 17 questions was circulated to 325 respondents/patients. The data was collected using a convenience sampling technique. Patients undergoing orthodontic treatment with fixed appliances aged 18 to 40 years were included in the study. Both male and female respondents who participated in the survey varied in terms of their ages, i.e., between 18 to 40 years. Version 24 of a statistical package for social sciences (SPSS) has been used for data analysis.

RESULTS: According to the study's findings, the lockdown's impact on patients undergoing orthodontic treatments was significant. For instance, anxiety & psychological distress were created during the lockdown because of concerns regarding the closure of hospitals and delayed visits to orthodontists or problems in getting appointments. Because of this, patients feared prolonged treatment durations and orthodontic emergencies, including discomfort, wires pinching them, ruptured skin, damaged brackets, ligature ties and bondable buccal tubes, etc.

CONCLUSION: Due to covid-19 lockdown, patients found difficulty in their regular appointments or monthly checkups as the hospitals were closed. Patients also experienced mental distress, making it imperative to comprehend the psychology of individuals experiencing orthodontic care.

KEYWORDS: COVID-19 lockdown, Orthodontic treatment, Psychological distress, Treatment needs, Pandemic, Emergencies

INTRODUCTION

The sudden increase in the deadly disease of COVID-19 shows the way to several countries from every corner of the world to the complete shutdown of universities, schools, private clinics, dental setups, and hospitals¹. The psychological impact of this pandemic did not just impact the education sector. Still, the overall living conditions of people, and this thus resulted in people's anxiety and poor health conditions.

Like all other health specialties, dentists used to deal with anxious patients regularly, and during covid-19, this anxiety increased because of the shutdown of hospitals and clinics. The dentists, their assistants, and patients are more exposed to aerosol (salivary and blood droplets) generated from ultrasonic instruments such as a high-speed handpiece². Orthodontics treatment delivery involves very close contact with patients, which is the main transmission route of the COVID-19 pandemic, and for this reason, follow-up orthodontic appointments have been interrupted.

Due to COVID-19, the escaping and delay in dental

treatment affected the importance of treatment provided to patients, two as this leads to pain, low self-esteem, compromised periodontal status, and poor oral hygiene. This pain may be a causative factor in anxiety and discontinuation or delay of an orthodontic appointment³. Poor oral health and delay in treatment frequently lead to dental diseases and further provocation of pre-existing diseases.

Usually, dental fear varies according to age, gender, and level of education. The frequent hindrances in orthodontic treatment from the side of patients are cost, dietary limitations, oral hygiene maintenance, pain, and extractions⁴. However, due to the extended shutdown, patients undergo a feeling of disconnection from the community, which leads to anxiety, depression, and lots of other problems, such as speech and chewing difficulties, indigestion, and attrition of teeth, etc. During the lockdown, orthodontic emergencies occurred in some patients regarding loose bands/brackets, protruding wires, and unnecessary tooth movements (rotations, intrusion, extrusion). Still, they were unable to get help from their dentists⁵.

The current pandemic has strengthened orthodontists' ideas and helped them effectively determine how to manage and decrease airborne particle creation in modern practice⁶. When patients contacted orthodontists concerning postponed orthodontic

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appointments or non-urgent issues, they did their best to address their patients' questions first before providing suggestions based on their issues⁷.

Thus, the objective of this study was to evaluate how the COVID-19 lockdown affected patients receiving orthodontic treatment in terms of their routine checkups and monthly consultations, visits to the orthodontist for necessary treatment, mental distress among patients related to the post-lockdown visits to orthodontists, and costs of treatment.

The rationale of this study was to assess the influence of the COVID-19 pandemic on patients undergoing orthodontic treatment so that if this pandemic comes again, it will help the orthodontic community deal with patients' emergencies, regular appointments and follow-up visits.

METHODOLOGY

An Ambispective study and survey-based questionnaire were used to collect data from July to August 2022. This investigative questionnaire contains 17 questions circulated to 325 respondents/patients coming to the Dr. Ishrat ul Ibad Khan Institute of Oral Health Sciences, Department of Orthodontics, for follow-up visits. Prior permission from the institutional research ethics committee (IRB- 2163/DUHS/ Approval/2021) was obtained before the survey. Also, verbal consent from respondents to participate in this

survey was taken before distributing the questionnaire. Moreover, the responders have explained in advance that the study is voluntary and that the information they share will be kept anonymous. Both male and female respondents who participated in the survey varied in terms of their ages (18-40).

The calculated sample taken was 322, rounded off by 325 using openEpi online software sample size calculation. The prevalence of problems patients face with anything fixed in their mouth in lockdown is 29.9% (1), 80% power of the test; the calculated sample size is 322 round off 325 patients with a 95% confidence level.

Patients undergoing orthodontic treatment in a tertiary care hospital for six months, Patients with fixed appliance treatment, and Patients between 18-40 years were included. Patients with craniofacial deformities or medical conditions taking anti-psychotic drugs were excluded from the study.

For data collection, the selection of individuals undergoing orthodontic care at the Department of Orthodontics, DIKIOHS and coming for follow-up visits was collected. The investigative questionnaire containing 17 questions was circulated to 325 respondents using Convenience sampling as the patients returning to the Department after the COVID-19 lockdown were included in the study. The poll was

Table I: The significance of routine checkups and frequent appointments from the patient's stand point

Query	Reply	N	%	X ² -value	p-value
Q1. When was the last time you saw your orthodontist?	1. 4 to 5 months	113	34.8	16.917	<0.001
	2. Well beyond six months	136	41.8		
	3. I'm forgetful.	76	23.4		
Q2. What level of concern do you have about not being able to receive frequent treatment follow-ups?	1. Extremely concerned; I want to see my orthodontist soon I'm anxious and want to see my orthodontist soon	155	47.7	70.935	<0.001
	2. I'm not worried because anything that goes badly can be repaired afterwards	132	40.6		
	3. The widespread pandemic is what worries me the most	38	11.7		
Q3. Are you adhering to all of your orthodontist's instructions, including those about the use of elastics and other dental care advice?	1. I did indeed pay close attention to everything	239	73.5	254.148	<0.001
	2. Infrequently, occasionally	74	22.8		
	3. I do not own the necessary materials (e.g., My elastics got over and lack of floss)	12	3.7		
Q4. Have you spoken with your orthodontist recently?	1. In the event of any treatment-related issues, I do indeed contact my orthodontist	236	72.6	238.640	<0.001
	2. No, I haven't phoned my doctor since the shutdown began	71	21.8		
	3. My orthodontist is never available when I call, despite my best efforts	18	5.5		
Q5. Are you regularly checked on by your orthodontist?	1. Yeah, my orthodontist calls me frequently to see how things are doing	243	74.8	260.868	<0.001
	2. I have not received a call from my orthodontist since the lockdown began	64	19.7		
	3. When my doctor calls, I don't answer it because it's pointless since I can't go see him or her	18	5.5		
Q6. What made you quit going to the orthodontist?	1. The hospital was shut	215	66.2	190.105	<0.001
	2. I was worried about COVID-19 spreading	97	29.8		
	3. I was abroad.	13	4.0		
Q7. What was your primary worry throughout this time?	1. Therapy will last longer	228	70.2	198.837	<0.001
	2. I'd have tooth relapses	43	13.2		
	3. No impact on therapy	54	16.6		

anonymous, and they could answer all questions. Before starting the survey, verbal consent was obtained from each respondent undergoing orthodontic treatment before the COVID-19 lockdown. 20 minutes were given to each participant for filling out the form the questionnaire poll received responses from 325 participants in total. The categorization of all 17 questions in three domains based on comparisons of variations in the distribution of answers is shown below.

Q1 - Q7 was categorized based on "the significance of routine checkups and frequent appointments from the patient's standpoint".

Q8 - Q14 were categorized based on "covid-19 lockdown's effect on patients' visits to orthodontic surgeons for treatment needs".

Q15 - Q17 were categorized based on "patients' psychological distress related to their orthodontist visit after the lockdown and medical fees".

The Statistical Software for Social Sciences (SPSS) version 24 was used to examine the study's data. For quantitative data, frequency and percentage were calculated, also the Chi-square goodness of fit test has been performed to compare the variation in the distribution of responses for the various study questionnaires. P-value 0.05 is the significance level.

RESULTS

Table I shows that the COVID-19 lockdown had a statistically significant impact on routine checkups and appointment frequency from patients' perspective (p-values <0.05). This impact was most correlated with the regular follow-up by the orthodontist through phone calls (X2 value 260.868).

Table II also had significant results showing lockdown's effect on patients' visits (p-values < 0.05). This lockdown substantially affected the patient's understanding of the importance of scheduled appointments (X2 value 426.348).

Table III shows patients' psychological distress related to their orthodontists, which had significant results (p-values < 0.05). In contrast, patients were unafraid to visit the orthodontic clinic after the COVID-19 lockdown (X2 value 151.243).

DISCUSSION

Patients receiving orthodontic treatment have had numerous challenges due to the COVID-19 shutdown regarding their regular appointments, treatment emergencies, treatment charges, etc. As per the study's findings, anxiety & psychological distress created during the lockdown because of concerns regarding the closure of hospitals and delayed visits to

Table II: Covid-19 lockdown's effect on patients' visits to orthodontic surgeons for treatment needs

Query	Reply	N	%	X ² -value	p-value
Q8: What specific aspect of your treatment are you most concerned about?	1. My treatment period will last longer, and I'll wear my braces much longer	250	76.9	279.920	<0.001
	2. Something that shouldn't happen to my teeth during my therapy could occur	48	14.8		
	3. My orthodontist won't have enough time to devote to my treatment because of the volume of work that will follow the lockdown	27	8.3		
Q9: Have you experienced any issues with any fixed appliance in your mouth since the lockdown began? (e.g., appliances, plates, brackets and elastics)	1. Yes, Indeed, some of the brackets are broken, and some components, such as elastics, have fallen loose	140	43.1	66.726	<0.001
	2. No, nothing has changed from before the shutdown	146	44.9		
	3. I'm not sure how to do a check, and I'm not sure	39	12.0		
Q10: What issues do you experience most often?	1. I have a wire poking me in the arm that came out, and pain	114	35.1	109.892	<0.001
	2. Several brackets and elastics have recently been released	93	28.6		
	3. No issues	117	36.0		
Q11: Have you experienced any emergencies from treatment after the lockdown, such as discomfort, swelling, lacerations/cuts, etc.?	1. No, I haven't had any issues with my braces or other appliances	157	48.3	73.575	<0.001
	2. Yes, but I contacted my orthodontist to get advice	131	40.3		
	3. Yes, but I am alright since I took self-medication without telling my orthodontist	37	11.4		
Q12: Do you believe orthodontic care should be treated as an Emergency?	1. Yes, because I do not want my treatment to end in failure	109	33.5	6.671	<0.001
	2. Yes, since some issues, such as cuts, lacerations, swellings, etc., can be regarded as emergencies	89	27.4		
	3. No, because it is not immediately dangerous	127	39.1		
Q13: Who do you believe is more impacted by the lockdown?	1. I believe I am less affected than my orthodontist.	52	16.0	143.674	<0.001
	2. I believe I am more affected.	63	19.4		
	3. I believe this lockdown is having an equal impact on me and my orthodontist.	210	64.6		
Q14: During this shutdown:	1. Made me understand how important it is for me to keep my scheduled appointments.	239	73.5	426.348	<0.001
	2. Shown me that, as long as nothing happens, missing appointments is acceptable.	30	9.2		
	3. Neither changed my opinion of my treatment, nor did it affect me.	55	16.9		

Table III: Patients' psychological distress related to their orthodontist visit after the lockdown and medical fees

Query	Reply	N	%	X ² - value	p-value
Q15: What do you think about the cost of your therapy after the lockdown?	1. To make up for lost revenue, orthodontists may charge more or suggest unneeded operations	42	12.9	140.129	<0.001
	2. Unconcerned since I assume the amount is unchanged from what I was previously told	207	63.7		
	3. Everything is fine with me as long as my therapy is over quickly	76	23.4		
Q16: When do you intend to visit your orthodontist after this lockdown?	1. I'll head straight for the hospital	138	42.5	117.422	<0.001
	2. I'll wait for my orthodontist to contact me and schedule an appointment	169	52.0		
	3. I won't leave till the pandemic is completely over	18	5.5		
Q17: When the lockdown ends, are you afraid to visit your orthodontist?	1. Indeed, I'm afraid	68	20.9	151.243	<0.001
	2. I'm not afraid, no	212	65.2		
	3. Not much, but compared to earlier, my worry has grown	45	13.8		

orthodontists or problems in getting appointments impacted the patients who needed orthodontic treatments badly.

As per the responses (Tables I, II & III), it has been concluded that patients faced difficulties during the lockdown when visiting their orthodontist for regular checkups / monthly appointments. For instance, Table 41.8% of patients admitted that the lockdown had prevented them from seeing their orthodontist for more than six months and were very concerned about their treatment prognosis. In comparison, 66.2% of the patients revealed that they stopped visiting their orthodontists during lockdown because of the hospital's closure. This delay in visiting their orthodontists affects patients' oral hygiene as treatment time increases and plaque accumulation is also expected. Another study found that the plaque that forms around brackets and under improperly fitting bands presents a high and ongoing cariogenic challenge, accelerating the demineralization process associated with orthodontic therapy⁸.

Also, during the lockdown, 70.2% of the patients' top worry was an extension of their treatment schedule. Yet, 76.9% of patients expressed anxiety about their therapy taking longer than expected and having to wear braces for longer. The lockdown, according to 64.6% of those surveyed, had an equal impact on them and their orthodontist, and, according to 73.5%, it made them understand how crucial it is to keep all of their scheduled appointments, as most patients also experience emergencies. According to one of the studies, orthodontic crises were most frequently caused by loose brackets or bondable buccal tubes, loose bands, soft tissue trauma caused by the overextension of the terminal wire, loose ligature ties, and dislodgment of elastomeric chains⁹.

Also, 63.7% of patients were unconcerned about the expense of their care, but instead, they were worried about their appointments and the transmission of disease due to the pandemic; this shows that lockdown affects not only patients' health but also their regular checkups/monthly appointments; treatment needs; psychological distress, treatment charges, and time. In a study by Sella¹⁰, most orthodontic patients thought

that the pandemic might marginally impair the length and quality of their treatment, and a tiny minority thought that considerable and irreversible damage would also result, in addition to a longer treatment time. The same study concluded no discernible rise in orthodontic emergency appointments during lockdowns¹⁰. Patients who had their appliances fixed had more issues than other patients¹¹. A Study by Hariclea showed that almost half of their sample was concerned about their treatment complications and delay during the COVID lockdown¹². During the pandemic, 38% of patients suffered mentally because of their orthodontic treatment⁵.

CONCLUSION

This study concluded that most patients were affected by the COVID-19 lockdown and found difficulty in their regular appointments or monthly checkups as the hospitals were closed. Many patients experienced orthodontic emergencies due to debonding and debanding. Many patients were concerned about their visits once the lockdown ended, with protective measures. Patients also experience mental distress, so understanding the psychology of patients undergoing orthodontic treatment is essential.

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AUTHOR CONTRIBUTIONS

Haque P: Conceived the idea, article writing, analysis
Rizwan S: Conceived the idea, supervision of research
Ahmed I: Analysis
Khan T: Analysis
Tabassum H: Data collection
Hussain S: Data collection

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