

Effect of COVID-19 Lockdown on Patients Undergoing Orthodontic Therapy in District Solan Population

Isha Aggrawal¹, Deva Mukesh Gupta², Sanjay Mittal³,
Tanzin Palkit⁴, Merry⁵, Avijit Awasthi⁶

Author's Affiliation: ¹Professor, ²Junior Lecturer, ³HOD, ⁴Reader, ^{5,6}Senior Lecturer, Department of Orthodontics and Dentofacial, Bhojia Dental College and Hospital, Himachal Pradesh 173205, India.

Corresponding Author: Deva Mukesh Gupta, Junior Lecturer, Department of Orthodontics and Dentofacial, Bhojia Dental College and Hospital, Himachal Pradesh 173205, India.

E-mail: devagupta22@gmail.com

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Abstract

The on-going Corona virus disease (COVID-19) outbreak has become the world's leading health headline and is causing major panic and public concerns. There are very less studies for the orthodontic patient perspective where they were entirely restricted to their homes. **Aim:** To assess the impact of COVID-19 lockdown on patients undergoing Orthodontic Treatment in district Solan population. **Materials and method:** A self-designed questionnaire of 14 questions was distributed to 120 patients. The obtained data was evaluated using descriptive and inferential statistics. **Results:** The study revealed that the majority of patients were affected by the lack of access to orthodontic visits with fear of increased treatment time. They faced problems like poking wires, broken brackets, lose bands etc and had lack of communication between the orthodontist and patients. **Conclusion:** The study threw light on the essential need for understanding the psychology of patients undergoing orthodontic treatment. In any situation where patients do not have access to seek help. All the factors discussed in the study should be considered and it is of utmost importance that orthodontic professionals see to it that their patients are being looked after mentally, if not physically, in whatever way possible.

Keywords: COVID-19; Orthodontic treatment; Patient psychology.

Introduction

The on-going Coronavirus disease (COVID-19) outbreak has become the world's leading health headline and is causing major panic and public concerns. On January 30, 2020, the World Health Organization (WHO) declared that the new coronavirus outbreak is a public health emergency of international concerns. As of February 8, 2020, WHO reported 34,886 confirmed cases of COVID-19 globally, with 34,589 of them occurring in China (including 6101 severe cases and 723 deaths). A

total of 288 other confirmed cases (with 1 death) have been reported in 24 countries, including Japan, Australia, Germany, and United States.¹ The restrictions in India came into force overnight on March 24, 2020, which at first was announced to be for 21 days following which continued to be extended due to the steady increase in incidence rates.² As a result, all OPDs, dental clinics, and institutions across India were instructed to be shut, leaving only emergency services functioning. In the field of orthodontics, treatment is generally not

considered an emergency. However, what is not understood is the importance of regular check-ups or monthly appointments, as well as the impact of restrictions put on patients concerning visiting their orthodontists in times of need.³

Intending to get an idea as to how this lockdown affected the treatment progress, as well as understanding the difficulties faced, the study was conceived, and a survey was circulated to assess the impact of the COVID-19 related lockdown on those patients undergoing orthodontic treatment in District Solan population.

Aim and Objectives

To assess the impact of COVID-19 lockdown on patients undergoing orthodontic treatment in district solan population.

Materials and Method

Data for this questionnaire-based study was obtained. Patients consent to participate in the study was taken.

Selection Criteria

Those individuals undergoing orthodontic treatment of any form (fixed/removeable appliances), whose treatment started before the implemented lockdown in the Dentofacial Orthopedics, Bhojia Dental College BudhBaddi.

Study Design

A self-designed closed-ended questionnaire.

Study Duration

The data was collected of the patients who started treatment before April 10, 2020 in the Department of Orthodontics and Dentofacial Orthopedics, Bhojia Dental College BudhBaddi. A total of 120 filled questionnaires were reverted, and the data was assessed.

Data Collection

The samples were selected by random sampling

methods, based on the collection of a list of those patients receiving orthodontic treatment from Department of Orthodontics and Dentofacial Orthopedics, Bhojia Dental College BudhBaddi.

The questionnaire consisting of 14 questions were distributed to 120 potential responders manually. It was mandatory to answer all questions and the survey was anonymized and did not contain any identifying information.

Statistical Analysis

Statistical Package for Social Sciences (SPSS) for Windows, Version 22.0, released 2013, IBM Corp., Armonk, NY, was used to perform statistical analyses. The descriptive analysis included the expression of participants' responses to the study questionnaire using frequency and proportions. Chi-square test was used to compare the difference in the distribution of responses for the study questionnaire. The level of significance (p-value) was set at $p < .05$.

Results

The samples were selected by random sampling method, based on the collection of a list of those patients receiving orthodontic treatment from Department of Orthodontics and Dentofacial Orthopedics, Bhojia Dental College BudhBaddi. The questionnaire consisted of 14 questions distributed to 120 potential responders manually. It was mandatory to answer all questions. [SPSS] software was used to perform statistical analyses.

The descriptive analysis included the expression of participants' responses to the study questionnaire using frequency and proportions. Chi-square test was used to compare the difference in the distribution of responses. The level of significance (p-value) was set at $p < .05$. The questions were categorized into 2 categories as depicted in Tables 1 and 2. Sexual dimorphism differences were depicted in Table 3 and 4.

Table 1: Comparison of Differences in the Distribution of Responses Toward “Patient General Perspective Importance of Regular Check-ups/Monthly Appointments” Domain Using Chi Square Test.

Questionnaire	Respondent answer	Frequency (n)	Percentage (%)	Chi-square χ	P Value
Q. 1: How long has it been since you visited your orthodontist?	More than 1 month	46	38.3	17.550	0.000*
	Much more than 2	55	45.8		
	I do not remember	19	15.9		
Q. 2: How worried that you are not getting to go for regular follow ups for your treatment?	Very worried, I wish to meet my orthodontist soon	38	31.7	7.350	0.02*
	Not so worried, everything that goes wrong can be fixed later	53	44.1		
	I am more concerned about the worldwide pandemic	29	24.2		
Q. 3: Are you following all the instructions given by your orthodontist, such as wearing of elastics and other oral hygiene instructions?	Yes, following all of it very accurately	32	26.6	2.400	0.30
	Sometimes, not too regular	44	36.7		
	No, I do not have the material needed (eg, My elastics got over and lack of floss)	44	36.7		
Q. 4: Have you been in touch with your orthodontist?	Yes, I call my orthodontist if at all I have any problems regarding my treatment	41	34.2	0.050	0.97
	No, I have not called my orthodontist since the lockdown started	40	33.4		
	I tried calling my orthodontist, but he/she is never reachable	39	32.5		
Q. 5: Does your orthodontist check on you regularly?	Yes, my orthodontist calls me regularly to check if everything is okay	54	45	25.40	0.000*
	No, my orthodontist has not called me since the lockdown started	52	43.3		
	My orthodontist calls me, but I do not pick up because anyway there is no use since I cannot visit him/her	14	11.7		

Table 2: Comparison of Differences in the Distribution of Responses Toward “Impact of Lockdown on Patients’ Visit to Orthodontist for Treatment Needs” Domain Using Chi Square Test.

Questionnaire	Respondent answer	Frequency (n)	Percentage (%)	Chi-square χ	P Value
Q. 6: What exactly are you most worried about regarding your treatment?	My treatment time will be longer and I will have my braces on for much more time	40	33.3	3.200	0.20
	My treatment can go wrong, things that are not supposed to happen with my teeth can happen	48	40		
	My orthodontist will have a lot of work post lock down, so he/she will not be able to give enough time to my treatment	32	26.7		
Q. 7: Since the lockdown started, have you had any problems with anything fixed in your mouth (eg, brackets, elastics, appliances and plates).	Yes, there are broken brackets and a few things like elastics have come out	47	39.2	2.450	0.29
	No, everything is as it was before the lockdown	40	33.3		
	I do not know how to check, and I am unsure	33	27.5		
Q. 8: What problems are you most commonly facing with your braces?	The wire came out and is poking me, and I have pain	36	30	0.800	0.67
	A few brackets and elastics have come out	44	36.7		
	No problems	40	33.3		

Q. 9: Have you suffered from any emergency such as pain, swelling, lacerations/ cuts, etc., due to treatment since the lockdown?	No, my braces/ appliances have not given me any problem	61	50.8	16.550	0.000*
	Yes, but I called my orthodontist and asked him/her what to do	30	25		
	Yes, but I took self-medication without informing my orthodontist and I am fine.	29	24.2		
Q. 10: Do you think that orthodontic treatment should be considered an emergency?	Yes, because I do not want anything to go wrong with my treatment	27	22.5	23.250	0.000*
	Yes, because sometimes certain problems can be considered as emergencies such as cuts/ lacerations, swellings, etc.	66	55		
	No, because it is not life threatening	27	22.5		
Q. 11: Who do you think this lockdown is affecting more?	I think my orthodontist is more affected than I am	46	38.3	3.150	0.20
	I think I am more affected than my orthodontist	43	35.8		
	I think this lockdown is affecting both me and my orthodontist equally	31	25.9		
Q. 12: This lock down has:	Made me realize the importance of me being regular with my appointments	43	35.8	3.150	0.20
	Made me realize that is okay to miss appointments because nothing happened	46	38.3		
	Made no difference to what I think about my treatment	31	25.9		
Q. 13: What do you think about your treatment cost following the lockdown?	Orthodontist may charge extra or advice unnecessary procedures to make up for money loss	49	40.8	6.650	0.03*
	Not worried, since I believe that the amount remains same that was told to me earlier	44	36.7		
	I am okay with anything as long as my treatment finishes fast	27	22.5		
Q. 14: Are you scared to visit your orthodontist after the lockdown ends?	Yes, I am scared	59	49.1	14.150	0.01*
	No, I am not scared	27	22.5		
	Not so much, but my fear has increased as compared to before	34	28.4		

Table 3: Comparison of Differences in the Distribution of Responses Toward “Patient General Perspective Importance of Regular Check between males and females- ups/Monthly Appointments” Domain Using Chi Square Goodness of Fit Test.

Questionnaire	Gender	Respondent answer	Respondent answer	Respondent answer	Total (n=120)	Chi-square(χ^2)	P Value
Q. 1: How long has it been since you visited your orthodontist?		More than 1 month	Much more than 2	I do not remember			
	Male	23(45.1%)	21(41.2%)	7(13.7%)	51 (42.5%)	1.727	0.42
	Female	23(33.3%)	34(49.3%)	12(17.4%)	69 (57.5%)		
Q. 2: How worried that you are not getting to go for regular follow ups for your treatment?		Very worried, I wish to meet my orthodontist soon.	Not so worried, everything that goes wrong can be fixed later.	I am more concerned about the worldwide pandemic		0.929	0.63
	Male	18(35.3%)	20(39.2%)	13(25.5%)	51		
	Female	20(29%)	33(47.8%)	16(23.2%)	69		

Q. 3: Are you following all the instructions given by your orthodontist, such as wearing of elastics and other oral hygiene instructions?		Yes, following all of it very accurately	Sometimes, not too regular	No, I do not have the material needed (eg, My elastics got over and lack of floss)	2.760	0.25
	Male	17(33.4%)	19(37.2%)	15(29.4%)	51	
	Female	15(21.7%)	25(36.2%)	29(42.1%)	69	
Q. 4: Have you been in touch with your orthodontist?		Yes, I call my orthodontist if at all I have any problems regarding my treatment	No, I have not called my orthodontist since the lockdown started	I tried calling my orthodontist, but he/she is never reachable	5.852	0.05*
	Male	18(35.3%)	22(43.2%)	11(21.5%)	51	
	Female	23(33%)	18(26%)	28(41%)	69	
Q. 5: Does your orthodontist check on you regularly?		Yes, my orthodontist calls me regularly to check if everything is okay	No, my orthodontist has not called me since the lockdown started	My orthodontist calls me, but I do not pick up because anyway	1.431	0.48
	Male	25(49%)	22(43.2%)	4(7.8%)	51	
	Female	29(42.1%)	30(43.4%)	10(14.5%)	69	

Table 4: Comparison of Differences in the Distribution of Responses Toward “Impact of Lockdown on Patients’ Visit to Orthodontist for Treatment Needs” between males and females, Domain Using Chi Square Goodness of Fit Test.

Questionnaire	Gender	Respondent answer	Respondent Answer	Respondent answer	Total (n=120)	Chi-square(χ^2)	P Value
Q. 6: What exactly are you most worried about regarding your treatment?		My treatment time will be longer and I will have my braces on for much more time	My treatment can go wrong, things that are not supposed to happen with my teeth can happen	My orthodontist will have a lot of work post lock down, so he/she will not be able to give enough time to my treatment			
	Male	17(33.4%)	20(39.2%)	14(27.4%)	51	0.034	0.98
	Female	23(33%)	28(41%)	18(26%)	69		
Q. 7: Since the lockdown started, have you had any problems with anything fixed in your mouth (eg, brackets, elastics, appliances and plates).		Yes, there are broken brackets and a few things like elastics have come out	No, everything is as it was before the lockdown.	I do not know how to check, and I am unsure.		5.477	0.06
	Male	14(27.4%)	19(37.3%)	18(35.3%)	51		
	Female	33(47.8%)	21(30.4%)	15(21.8%)	69		
Q. 8: What problems are you most commonly facing with your braces?		The wire came out and is poking me, and I have pain	A few brackets and elastics have come out	No problems		1.507	0.47
	Male	18(35.3%)	16(31.4%)	17(33.3%)	51		
	Female	18(26%)	28(41%)	23(33%)	69		
Q. 9: Have you suffered from any emergency such as pain, swelling, lacerations/ cuts, etc., due to treatment since the lockdown?		No, my braces/ appliances have not given me any problem	Yes, but I called my orthodontist and asked him/her what to do	Yes, but I took self-medication without informing my orthodontist and I am fine.		1.454	0.48
	Male	26(51%)	15(29.4%)	10(19.6%)	51		
	Female	35(50.7%)	15(21.8%)	19(27.5%)	69		

Q. 10: Do you think that orthodontic treatment should be considered an emergency?	Yes, because I do not want anything to go wrong with my treatment	Yes, because sometimes certain problems can be considered as emergencies such as cuts/lacerations, swellings, etc.	No, because it is not life threatening	0.600	0.74
	Male	10(19.6%)	30(58.8%)	11(21.6%)	51
	Female	17(24.6%)	36(52.2%)	16(23.2%)	69
Q. 11: Who do you think this lockdown is affecting more?	I think my orthodontist is more affected than I am	I think I am more affected than my orthodontist	I think this lockdown is affecting both me and my orthodontist equally	1.838	0.39
	Male	23(45%)	17(33.3%)	11(21.6%)	51
	Female	23(33.4%)	26(37.6%)	20(29%)	69
Q. 12: This lock down has:	Made me realize the importance of me being regular with my appointments	Made me realize that is okay to miss appointments because nothing happened	Made no difference to what I think about my treatment	4.308	0.11
	Male	15(29.4%)	18(35.3%)	18(35.3%)	51
	Female	28(41%)	28(41%)	13(18%)	69
Q. 13: What do you think about your treatment cost following the lockdown?	Orthodontist may charge extra or advice unnecessary procedures to make up for money loss	Not worried, since I believe that the amount remains same that was told to me earlier	I am okay with anything as long as my treatment finishes fast	0.426	0.80
	Male	22(43.1%)	17(33.4%)	12(23.5%)	51
	Female	27(39.1%)	27(39.1%)	15(21.8%)	69
	Male	30(58.8%)	16(31.4%)	5(9.8%)	51
	Female	32(46.4%)	17(24.6%)	20(29%)	69
Q. 14: Are you scared to visit your orthodontist after the lockdown ends?	Yes, I am scared	No, I am not scared	Not so much, but my fear has increased as compared to before	2.407	0.30
	Male	21(41.1%)	14(27.5%)	16(31.4%)	51
	Female	38(55.1%)	13(18.8%)	18(26.1%)	69

Discussion

The on-going Coronavirus disease (COVID-19) outbreak has become the world's leading health headline and is causing major panic and public concerns. As of February 8, 2020, WHO reported 34,886 confirmed cases of COVID-19 globally, with 34,589 of them occurring in China (including 6101 severe cases and 723 deaths). With the rapid rise in the number of cases with COVID-19, the pandemic has led to several governments across the world taking action and many cities were placed under complete lockdown, travel bans were implemented, schools, universities, and private clinics were indefinitely closed. For getting an idea that how this lockdown affected the treatment progress, as well as understanding the difficulties faced, the results revealed that most patients undergoing

treatment were concerned about their restriction to orthodontic clinic visits. To our knowledge, very few studies addresses the orthodontic patient perspective in such testing times.

The samples were selected by random sampling methods, based on the collection of a list of those patients who received orthodontic treatment from the Department of Orthodontics and Dentofacial Orthopedics, Bhojia Dental College BudhBaddi, before the implementation of lockdown. A total of 120 filled questionnaires were reverted, and the data was assessed. The questionnaire consisted of 14 questions. It was mandatory to answer all questions and the survey was statically analysed.

45.8% of the individuals replied that it had been over 2 months since their last follow up and the

result was statistically highly significant. Since Orthodontic therapy usually consists of bands, brackets or other appliances which are fixed into the patient's mouth, and thus the accumulation of plaque is mostly common. Rolla et al, Huser et al⁴ concluded that enamel demineralization associated with fixed mechanotherapy is an extremely rapid process caused by a high and continuous cariogenic challenge in the plaque developed around brackets and underneath ill-fitting bands. Bartschet al.⁵ stated that compliance is a major problem in orthodontics. Because there is going to be excessive plaque accumulation, along with patients' reduction in adherence to oral hygiene instructions due to prolonged treatment duration⁶ initially explained to them, appliance should be properly checked. To improve the oral hygiene status of the individual, mouth washes, tooth brushes and disclosing tablets 7 can be given to patients.

The survey revealed that 55% of patients said that orthodontic treatment can be considered an emergency, which was found to be highly significant, because sometimes certain problems can be considered as emergencies such as cuts/lacerations from wire ends, gingival swellings, ill fitted bands.⁸ It was found that patients were not so worried, according to them everything that goes wrong can be fixed later. But some patients faced a problem as wires impinging, in some brackets were debonded and few molar bands and elastics have come out during lockdown. Caprioglio et al⁹ and Suri et al in their article mention the possible orthodontic emergencies which can be managed at home such as cutting of distal ends of wires with nail cutters.

33.3% of patients were worried that their treatment time will be longer and they will have their braces on for much more time and the result was found to be statistically highly significant. Rokyoo et al⁶, SJ Lee et al. stated that compliance and the length of the orthodontic treatment were related to each other, that is compliance is stronger in case of shorter treatment durations, that is why we found the reduction in compliance of patients during the lockdown, 36.7% of patients stated that they were not following all instructions previously given to them as, they do not have the material needed and the result was statistically non significant.

A total of 40% of the patients were worried that something could go wrong with their treatment but the result was found to be statistically nonsignificant. This indicates the awareness of the need for regular follow-ups, 35.8% of patients stating that the lockdown had made them realize

the importance of regular follow-ups but the result was statistically non-significant. C Gómez et al.¹³ did a study to tell the importance of follow ups and continuous removal of plaque during orthodontic treatment.

A total of 36.7% of the individuals stated that they did not have the orthodontic material required to continue with the treatment progress as instructed to them by the orthodontist but the result was statistically nonsignificant. The unavailability of such material like elastics, relief wax leave both the orthodontist as well as patients in a helpless situation and may results in unwanted tooth movements, wounds, laceration etc.

44.1% of patients were not worried about their treatment as they did not faced any problem. 33.3% of the patients were found to be externally motivated to undergo treatment and have no active interest but the result was found to be statistically significant.

When asked if the patients were regularly in touch with their orthodontists, results showed that approximately 34.2% patients did keep in touch and 36.7% did not and the result was statistically non- significant

25.9% of the patients thought that the lockdown was affecting the orthodontist as well as patient equally this shows some patients are attached to their doctors and this result was statistically highly significant. McNeil DW et al.¹² did a study to doctor-patient relationship, patient satisfaction, and adherence in orthodontic treatment based on specific orthodontist behaviors as perceived by the patient.

When asked about the need for orthodontic treatment to be considered as an emergency, results revealed mixed opinions. According to Merriam-Webster Dictionary¹¹, the word "emergency" is defined as "an unforeseen combination of circumstances or the resulting state that calls for immediate action" or "an urgent need for assistance or relief." The severity and seriousness of the spread of disease should be clearly explained to all patients, making them aware of the importance of social distancing and the need for personal protection.

If at all patients plan on rushing to their orthodontist, it should be made sure these patients are symptomless and are visiting hospitals, clinics only for emergencies. The possible explanation for 22.5% of patients not having any fear to visit their orthodontist, shows the lack of awareness of the various modes of possible transmission of diseases

in a dental office with aerosols, doctors' proximity to patients, etc.¹⁰

24.2% of the patients were more concerned about the worldwide pandemic. This study thus throws light on the awareness of these patients about their health, not considering orthodontic treatment essential at such times. Such patients should be reassured that proper protection will be taken to limit the spread of disease.

When the comparison was done on the basis of sexual dimorphism we found that 57.5% of females and 42.5% males responded to question How long has it been since you visited your orthodontist? And the result was statistically nonsignificant. 57.5% of females and 42.5% males responded to question How worried that you are not getting to go for regular follow ups for your treatment? And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question Are you following all the instructions given by your orthodontist, such as wearing of elastics and other oral hygiene instructions?

And the result was statistically nonsignificant. 57.5% of females and 42.5% males responded to question Have you been in touch with your orthodontist? And the result was statistically significant 57.5% of females and 42.5% males responded to question. Does your orthodontist check on you regularly? And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question What exactly are you most worried about regarding your treatment? And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question Since the lockdown started, have you had any problems with anything fixed in your mouth (eg, brackets, elastics, appliances and plates) And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question What problems are you most commonly facing with your braces?

And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question Have you suffered from any emergency such as pain, swelling, lacerations/ cuts, etc., due to treatment since the lockdown? And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question Do you think that orthodontic treatment should be considered an emergency? And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question Who do you think this lockdown is affecting more? And the result was

statistically nonsignificant 57.5% of females and 42.5% males responded to question This lock down has: And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question What do you think about your treatment cost following the lockdown? And the result was statistically nonsignificant 57.5% of females and 42.5% males responded to question Are you scared to visit your orthodontist after the lockdown ends? And the result was statistically no significant. This clearly implies that females responded more than the males and were more concern for their treatment.

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