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## Awareness of COVID-19 and its protocols and perception about orthodontic treatment among orthodontic patients: A questionnaire study

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### Abstract

**Objective:** The main aim of this study is to understand the knowledge regarding Covid -19 protocols, concerns and apprehensions among orthodontic patients undergoing treatment and those intending on getting orthodontic treatment.

**Methodology:** An online anonymous questionnaire consisting of 26 questions was distributed to first 500 potential responders regarding their knowledge and perception of Covid-19 awareness and protocols. It was mandatory to answer all questions and the survey was anonymized and did not contain any identifying information.

**Results:** Chi Square Goodness of Fit test was used to compare the distribution in the responses for the study questionnaire addressing the knowledge and awareness towards COVID-19 and it was statistically significant ( $p=0.001$ ). Independent Chi Square test was used to compare the gender based differences in the responses for the questionnaire but no statistically significant difference was found.

**Conclusion:** The patient perception and awareness regarding COVID-19 and its prevention protocols was same regardless of the gender. The awareness among study subjects was high and willingness to undergo orthodontic treatment gave mixed results.

**Keywords:** COVID-19, prevention protocols, orthodontics

### Introduction

COVID-19/ Corona is the most dreaded word of this decade as this pandemic has globally affected more than 400 million people and causing more than 5 million deaths according to World Health Organization. As early as 2007, a paper published in the Clinical Microbiology Reviews on SARS coronavirus infection already warned us of “the presence of a large reservoir of SARS-CoV-like viruses in horseshoe bats, together with the culture of eating exotic mammals in southern China, is a time bomb” [1]. In spite of this grave alert, we are currently experiencing one of the most serious pandemics in human history. Covid-19 pandemic has invariably affected all branches of healthcare industry. The Occupational Safety and Health Administration (OSHA) classified dentistry as a “very high risk” profession [2]. Dental care settings invariably carry the risk of 2019-nCoV infection due to the specificity of its procedures, which involves face-to-face communication with patients, and frequent exposure to saliva, blood, and other body fluids, and the handling of sharp instruments. This deadly virus can be transmitted in dental settings through inhalation of airborne microorganisms that can remain suspended in the air for long periods, direct contact with blood, oral fluids, or other patient materials, contact of conjunctival, nasal, or oral mucosa with droplets and aerosols containing pathogens generated from an infected individual and propelled a short distance by coughing and talking without a mask, and indirect contact with contaminated instruments and/or environmental surfaces [3]. Thus, guidelines and safety protocols for dental practices in the COVID-19 era were established. Since the virus is highly contagious, majority of the dental procedures excluding emergency treatment procedures, especially Orthodontics is at a standstill. As we dentists have geared up the practice with all the protective measures and protocols in place we cannot ignore patient concerns during a visit to Orthodontic office.

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So the basic objective of this study is to understand the knowledge of patients regarding COVID-19, its protocols, concerns and apprehensions. Also to understand the perception of patients regarding orthodontic treatment during such times.

### Materials and Methods

The samples were selected randomly by sending a questionnaire among orthodontic fraternity who then forwarded the same to patients undergoing orthodontic treatment or those intending to get it. An online anonymous

questionnaire consisting of 26 questions was distributed to first 500 potential responders regarding their knowledge and perception of Covid-19, its prevention protocols and its effects on treatment delivery.

### Exclusion criteria

Incomplete questionnaires were excluded from the study. A carefully formulated questionnaire was distributed among the participants that had a total of 26 questions: 17 questions about general protocols and nine questions about dental and oral hygiene during Covid-19 pandemic.

#### Awareness and Knowledge about COVID 19: -

##### Socio-demographic Information:

- 1) Gender:
- 2) Age:
- 3) Marital Status:
- 4) Cohabitants: Y/N
- 5) Area of Residence:
- 6) Highest Level of Education:
- 7) Profession:
- 8) Location of workplace:

##### Regular Triage of questions:

- 9) Do have any of the following: Fever, Cough, Sore throat, and any persistence of pain, pressure and tightness in your chest, shortness of breath and new loss of smell and taste sensation / any flu like symptoms such as gastrointestinal upset, a headache, weakness or fatigue? Y/N
- 10) Any history of medically compromised condition? Y/N
- 11) Have you returned from travel overseas/ interstate in the last 14 days? Y/N

##### General awareness about COVID-19:

- 12) Are you aware of the basic protocol for Covid -19? Y/N
- 13) Are you aware, that frequent touching of your face can increase risk of Covid-19 infection? Y/N
- 14) Are you washing your hands with soap and using alcohol based hand rub (ABHR) when you are going out or in contact with any surfaces? Y/N
- 15) What should be the minimum distance maintained?
  - a) 1-2 m/ 6feet
  - b) 6m/ 2 feet
  - c) None of them mentioned
- 16) Is wearing a mouth mask mandatory? Y/N
- 17) Do you know how does SARS-CoV-2 (COVID -19) spread from person to person? Y/N

##### Dental and Oral Hygiene Awareness during COVID 19:

- 18) Has your oral hygiene practice changed during COVID 19? Y/N
- 19) Is mouthwash mandatory especially during COVID-19 pandemic? Y/N

- 20) What treatment procedures can be done/ considered emergency during (COVID -19)
- i) Severe dental pain not responding to analgesics/ pain killers
  - ii) Swelling over the gums / whole of the jaw
  - iii) Fractured tooth because of accident/Fall
- a) i
  - b) ii&iii
  - c) i & iii
  - d) All of the above
- 21) What are the causes of contaminations during dental procedures?
- i) Saliva. ii) Aerosols (a substance enclosed under pressure and released as a fine spray. iii) Instruments and equipment.
- a) i
  - b) ii&iii
  - c) i& iii
  - d) All of the above
- 22) Are orthodontic treatment procedures are considered emergency? Y/N
- 23) Are you willing come / willing to get your child for Orthodontic treatment during COVID - 19 outbreak? Y/N
- 24) Is it ok to skip dental /Orthodontic appointment during Covid outbreak? Y/N
- 25) If Tele dentistry/Tele Orthodontics is an option are you willing and comfortable with it? Y/N
- 26) Was there any economic impact of COVID 19? Mild/moderate/severe/noeffect.

**Statistical analysis**

Sample size estimation:  $N = Z^2_{(1-\alpha)} \times PQ / \delta^2$

$Z_{(1-\alpha)} = 1.96$  (For 95% Confidence Interval).  $P = 0.50$  [Based on the probability, that approximately 50% of the study participants will be having adequate knowledge and awareness on COVID-19]

$Q = 1 - P$

$\delta$  (Margin of Error) = 0.05,  $N = 384.16$ , rounded off to 400 (final sample size taken = 500).

The Statistical Package for Social Sciences [SPSS] for Windows Version 22.0 Released 2013. Armonk, NY: IBM Corp., was used to perform statistical analyses. Descriptive analysis of all the explanatory and outcome parameters was done using mean and standard deviation for quantitative variables, frequency and proportions for categorical variables.

Chi Square Goodness of Fit test was used to compare the distribution in the responses. Independent Chi Square test was used to compare the gender based differences in the responses. The level of significance [P-Value] will be set at  $P < 0.05$ .

**Results**

Out of the total 500 participants 56% (280) were females and 44% (220) were males, 69.4% were between the ages of 16-25 years. Differences in the responses to the questions related to regular triage process, related to general awareness, related to dental & oral hygiene awareness, related to awareness on Orthodontic treatment during covid-19, related to economic impact using Chi Square Goodness of Fit Test showed a statistically significant ( $p = 0.001$ ) (Table 1-4). Gender wise differences showed no statistically significant results.

**Table 1:** Comparison of distribution of differences in the responses to the questions related to general awareness of COVID-19 using Chi Square Goodness of Fit Test

Questions	Responses	n	%	$\chi^2$ Value	P-Value
Are you aware of the basic protocol for COVID -19?	Yes	463	92.6%	362.952	<0.001*
	No	37	7.4%		
Are you aware, that frequent touching of your face can increase risk of COVID infection?	Yes	438	87.6%	282.752	<0.001*
	No	62	12.4%		
Are you washing your hands with soap and using alcohol based hand rub (ABHR) when you are going out or in contact with any surfaces?	Yes	461	92.2%	356.168	<0.001*
	No	39	7.8%		
What should be the minimum distance maintained?	1-2 m / 6 ft	245	49.0%	160.132	<0.001*
	6m / 2 ft	221	44.2%		
	None	34	6.8%		
Is wearing a mouth mask mandatory?	Yes	473	94.6%	397.832	<0.001*
	No	27	5.4%		
Do you know does SARS-CoV-2 (COVID -19) spread from person to person?	Yes	401	80.2%	813.568	<0.001*
	No	99	19.8%		

**Table 2:** Comparison of distribution of differences in the responses to the questions related to Dental & Oral hygiene awareness during COVID-19 time using Chi Square Goodness of Fit Test

Questions	Responses	n	%	$\chi^2$ Value	P-Value
Has your oral hygiene practice changed during COVID 19?	Yes	309	61.8%	216.676	<0.001*
	No	191	38.2%		
Is mouthwash mandatory especially during COVID-19 pandemic?	Yes	382	76.4%	139.392	<0.001*
	No	118	23.6%		
What treatment procedures can be done/ considered emergency during COVID -19?	Option i	52	10.4%	653.408	<0.001*
	Option i & iii	48	9.6%		
	Option ii & iii	28	5.6%		
	All of the above	372	74.4%		
What are the causes of contaminations during dental procedures?	Option i	50	10.0%	526.864	<0.001*
	Option i & iii	60	12.0%		
	Option ii & iii	43	8.6%		
	All of the above	347	69.4%		

**Table 3:** Comparison of distribution of differences in the responses to the questions related to awareness on Orthodontic treatment during COVID-19 time using Chi Square Goodness of Fit Test

Questions	Responses	n	%	$\chi^2$ Value	P-Value
Which orthodontic treatment procedures are considered emergency?	No	192	38.4%	382.624	<0.001*
	Yes	308	61.6%		
Are you willing to come/willing to get your child for Orthodontic treatment during Covid-19 outbreak?	Yes	342	68.4%	67.712	<0.001*
	No	158	31.6%		
Is it ok to skip dental /orthodontic appointment during Covid-19 outbreak?	Yes	218	43.6%	8.192	0.004*
	No	282	56.4%		
If Tele dentistry/Tele orthodontics is an option are you willing and comfortable with it?	Yes	305	61.0%	24.200	<0.001*
	No	195	39.0%		

**Table 4:** Comparison of distribution of differences in the responses to the questions related to Economic Impact of COVID-19 time using Chi Square Goodness of Fit Test

Questions	Responses	n	%	$\chi^2$ Value	P-Value
Economic impact of COVID 19?	Mild	57	11.4%	114.320	<0.001*
	Moderate	154	30.8%		
	Severe	208	41.6%		
	No effect	81	16.2%		

**Discussion**

Adult orthodontic patients have peculiar psychological features as well as different treatment requirements compared to children and adolescents [4]. As adults have more access to information in current times their perception regarding pandemic and how it affects various treatment modalities is also vast. Studies [5] on Covid-19 pandemic and Orthodontic care concluded that the Covid-19 outbreak has changed the way Orthodontics is practiced. Strict infection control, near-zero aerosol production, and minimal touch dentistry are the keys to prevent contamination of Orthodontic operator. During the pandemic, only emergency orthodontic procedures could be extended to the Orthodontic patient while adhering to all the regulatory guidelines [5]. A survey-based study investigated the perception of Italian dentists of the return to their daily practices and of their risk during Orthodontic procedures. Italian dentists were mostly afraid to return to their daily activities, and women, younger dentists and dentists with higher distress levels were more frequently scared by this aspect. Dentists considered their job a high risk

to them and their families; however, orthodontic procedures were considered a lower risk compared with general dental procedures [6]. The current study showed that most of young adults were aware of the general protocols regarding covid-19. The guidelines recommended by regulatory authorities were mostly being followed. Also participants were aware about the effects it might have while getting treated. It might be because of widespread information on mass media. The perception of patients regarding general dental treatment and orthodontics seemed to be biased more towards emergency procedures. Although a large percentage (68.4%) of participants were ready to continue orthodontic treatment even in pandemic, it might be due to the fact that patients are more aware of the covid-19 prevention protocols. At the same time (43.6%) still felt that it is ok to skip dental /orthodontic appointment during and 61% participants were in favour of tele-dentistry for orthodontic treatment follow-ups. Such variations in results where a large percentage of population despite being aware, still feels that follow-up appointments can be skipped raises questions sat the perception of such patients regarding orthodontic treatment and covid-19 when visualized in conjunction.

Some guidelines that doctors and dentists should scrupulously observe in order to prevent the spread of SARS-CoV-2 have been documented by various authors. About 92.6% (fig.1a &b) participants of the study were familiar with basic covid-19 prevention protocol i.e., use of ABHR, mandatory mouth mask, social distancing.

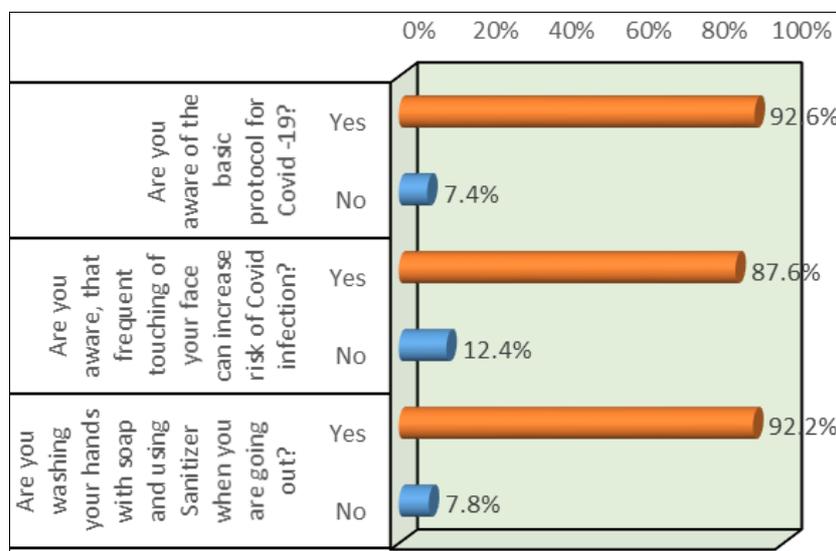


Fig 1(a): Distribution of differences in the response of the questions relate to general awareness of covid-19

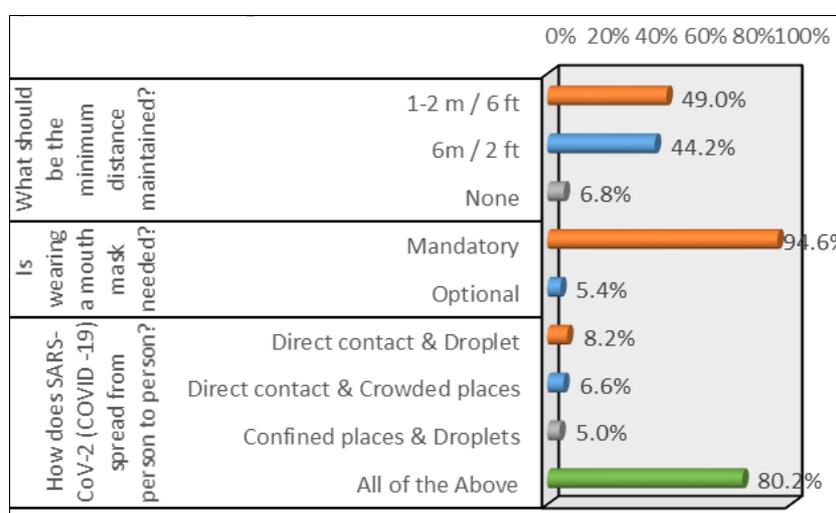


Fig 1(b): Distribution of differences in the response of the questions relate to general awareness of covid-19

In view of widespread patient information dental professionals should have knowledge regarding the safety procedures, the systems that can be used in order to purify the air, what measures they can take in order not to get infected, and how they have to perform dental treatments from now on. Because this information is changing, it will have to be updated with all the measures and protocols they have to follow [7, 8]. In view of the high level of patients’ awareness of the severity of the disease and the importance of social distancing and personal protection public health and medical experts have clamored for increased coronavirus screening testing to control the covid-19 pandemic [9].

The study also made a gender wise comparison of distribution of differences in the responses but the results were not statistically significant. The main reason being the general information among participants regardless of their gender. Also the economic impact of the pandemic was reported as severe by as many as 41.6% of the participants and that directly affects patient perception about orthodontic treatment in such scenario.

**Limitations**

Being a questionnaire, there was a possibility of reporting bias. The sample had no population generalization resulting in heterogeneity of the sample. Further case control and prospective cohort studies are recommended. The current

changing concepts of numerous variants and vaccination protocols were not taken into consideration.

**Conclusion**

- The study concluded that a vast majority of participants had significant awareness about covid-19 and protocols associated.
- The significant number of patients perceived orthodontic treatment as lesser emergency yet considered treatment and follow-up during covid-19 situation plausible.
- There was no gender bias regarding general awareness about covid-19, its prevention protocols, general dental procedures and orthodontic treatment during pandemic.

**Conflict of interest:** None

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