



ISSN Print: 2394-7489  
ISSN Online: 2394-7497  
IJADS 2021; 7(1): 259-267  
© 2021 IJADS  
[www.oraljournal.com](http://www.oraljournal.com)  
Received: 05-11-2020  
Accepted: 13-12-2020

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## Aesthetics behind the masks?: A new world of orthodontics

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**DOI:** <https://doi.org/10.22271/oral.2021.v7.i1d.1142>

### Abstract

**Aim:** To gauge perceptions of Practicing Orthodontists and Post Graduate students regarding various aspects of practicing Orthodontics during COVID-19 Pandemic.

**Methods and Material:** A Short Study Survey was conducted in the month of July 2020 by means of an online Survey Questionnaire in form of Google Forms to collect the information consisting of 10 questions in English Language regarding various aspects of Orthodontic Clinical Practice in the COVID-19 Pandemic. The responses were analyzed and a mathematical representation of the results is done in the form of Percentages to describe the expected and perceived changes in the field of Orthodontics Post COVID.

**Results:** The results were cumulated of 346 Google survey forms responses. The majority of responses were in the belief that COVID-19 impact would eventually lead to a mediocre 10-20 percent drop in the overall patients seeking treatment, with the point of focus for convincing patients remaining the same as before the Pandemic. The orthodontists were willing to work with mandatory precautionary and sanitation measures and were in the view that this additional cost be divided equally between the patient and the orthodontist. Price hike is believed to be by a meager amount and the treatment system of choice is the Self Ligating System. Debanding and Debonding procedures are the most risky procedures in terms of infection transmission and changes in our armamentarium is the most preferred way of increasing the interappointment time.

**Conclusion:** COVID -19 pandemic has without a doubt caused an array of impacts in the world of Orthodontics and the effect will be apparent in terms of patient inflow, price hike, sanitation protocols and precautionary measures, changes in the armamentarium etc. All these responses are probable beliefs and perceptions of the orthodontists and these responses might be transient and are subject to vary depending upon the gravity of the pandemic in the coming times.

**Keywords:** COVID-19, survey, orthodontics, corona, perception

### Introduction

A perilous virus named SARS-Cov-2 was first identified, following an outbreak in the city of Wuhan of Hubei province in China, in December 2019<sup>[1]</sup>. Since then, this virus has caused a worldwide pandemic as declared by the WHO in March 2020<sup>[2]</sup>. It majorly affects the respiratory system causing acute distress along with other deleterious effects (COVID – 19), which can be differentiated from interstitial bacterial pneumonia. SARS – COV-2 is still not fully known or understood by research community, but from various studies conducted in different parts of the world it has been suggested that it is highly infective through air borne contamination<sup>[3]</sup> which becomes a serious challenge in an already high infection risk zone of dental environment for both professionals and patients<sup>[4]</sup>.

Various studies by now have emerged regarding the protective and preventive measures which can be taken to reduce the risk of infection<sup>[5, 6]</sup>. A large section of the world population remained in total lockdown to reduce the transmission of infection for 3-4 months. In spite of these measures, it is now not possible to avoid the virus but to cautiously deal with it and live with it. Now the economy and daily life has started opening up gradually, in most parts of the country with various Standard Operating Procedures and Safety measures taken even in Dentistry by Professionals and Orthodontists in general to tackle the threat of infection<sup>[7, 8, 9, 10]</sup>.

There is no field or profession which has remained unfazed, be it Enterprises or Entertainment, Courts to Parliament, every walk of life has been severely affected by the Pandemic. Dentistry is no exception in this regard and by extension Orthodontics too has gone under a total overhaul. The dilemma between Lives and Livelihood still remains a tight rope to walk in Orthodontic practice. As we are slowly and steadily navigating through new normalcy of our Practices with vigilant caution, the basic ideals of our field: Structural balance, Functional efficiency and Esthetic harmony remain unshaken. Two schools of thoughts have emerged in the minds of our patients as we interact with them, the first that comes up, "This is the best time to get Ortho Treatment as my braces will remain hidden behind the mask." The other argument that comes up against it is, "How would my smile or aesthetics matter behind the mask?"

Masks have become mandatory in public spaces which are now a necessary evil to protect and prevent the transmission of the virus. Insights on the global Medical Aesthetics Market analysis report for the year 2020-2024 projected market growth of almost 7% while the year-over growth rate for 2020 is estimated at 6.49% despite the COVID Pandemic due to the major growth trend of increasing global awareness and growing geriatric population [11]. During the initial phases of Lockdown most of our practices suffered as only emergency dental procedures were allowed and to assess the severity of the condition innovative and technological means of communication by WhatsApp and Zoom were used [7, 8, 9, 10]. This Pandemic opened our eyes towards importance of technology and its use in digital-medicine and by extension digital-dentistry and Orthodontics by the role it can play in consultation, diagnosis and treatment planning.

We in Orthodontic Society need to figure out how to proceed forward in this era of masks and digital marketing with greater role of technology to tap into this potential rise of the market and capitalize on it and to see if this Pandemic will change how we function for better or for worse. This article provides an insight in to the Psyche of Orthodontists and their perceptions regarding the challenges and changes experienced during the Pandemic.

## Aim

The aim of this study is to gauge the perceptions of Practicing Orthodontists and Post Graduate students regarding various aspects of practicing Orthodontics during COVID-19 Pandemic.

## Objective

The objective of this study is to ascertain views of Orthodontists and PG students towards challenges faced by them to Practice Orthodontics during the Pandemic.

## Subjects and Method

A Short Study Survey was conducted in the month of July 2020, and a Questionnaire was formulated in English language comprising of 10 questions finalized after due diligence. Due to the circumstances and keeping in mind the need for Physical distancing A Google Survey form was chosen as the means for the study instead of Physical Papers. A pilot testing of the survey questionnaire was done to test the working of the link and other concerns amongst Five experienced Orthodontists and the Survey Questionnaire was then circulated among larger sample after feedbacks and alterations. The Survey was mailed to 500 Orthodontists and Post Graduate Students by the means of Random Sampling from various Orthodontic Study Groups from Indian Orthodontic Society. Virtual Study Performa and Participant Consent Form were virtually provided by online links to the Participants. The Participants were given time to respond till after which the responses were not included in the study.

## Material

Digital Google form consisting of 10 questions was used as a tool to conduct an online survey. A virtual Study Performa and Voluntary Participant Personal Details forms were provided online as WhatsApp links to the Participants, by which filling the relevant details would lead them to the Study Questionnaire form.

The Following Study Performa was provided with an online link to proceed towards the Participant Information Sheet. (Figure 1, 2, 3, 4)

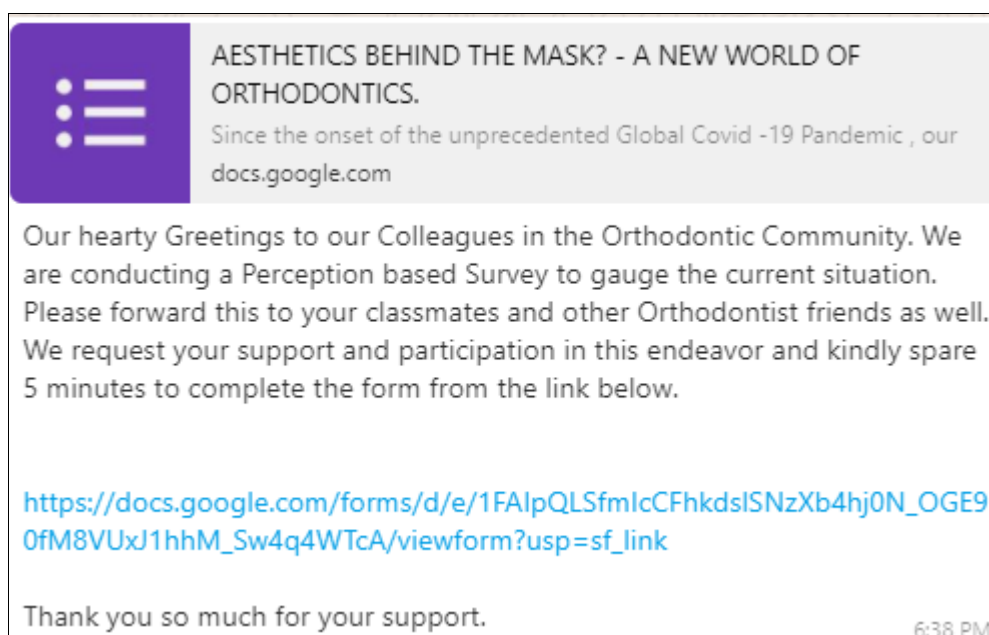


Fig 1: Google Survey Form Link

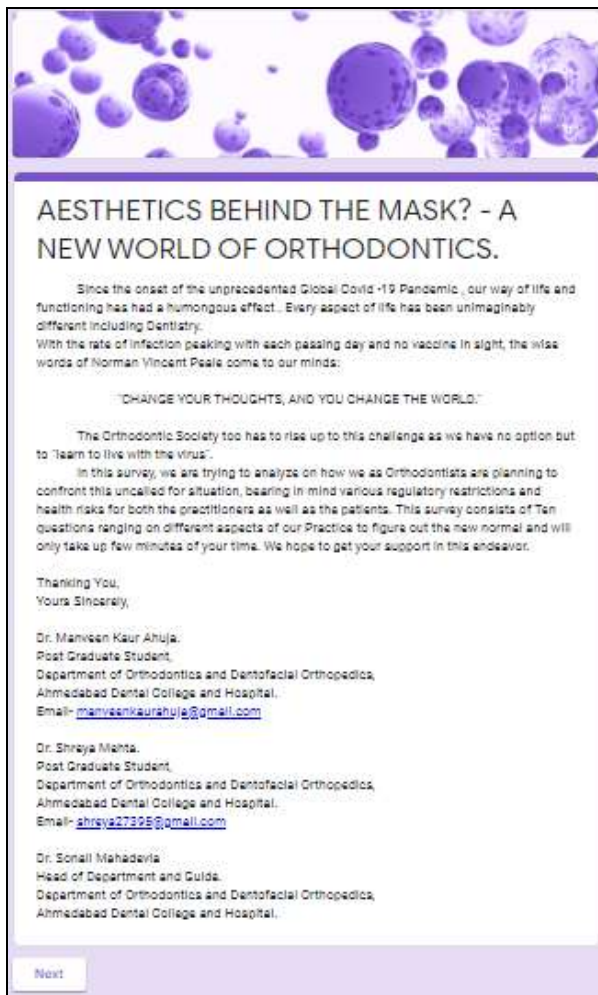


Fig 2: Survey Form Introduction

**AESTHETICS BEHIND THE MASK? - A NEW WORLD OF ORTHODONTICS.**

**Required**

**DEMOGRAPHIC DETAILS**

This is to help to assure you that all the information you are providing here will strictly remain confidential and you thereby agree to volunteer to provide all the correct and relevant information for the use of this study.

Name \*

Your answer \_\_\_\_\_

Age \*

Your answer \_\_\_\_\_

Title \*

Private Practitioner

Post Graduate Student

Gender \*

Male

Female

Post Graduate Year

First Year

Second Year

Third Year

Number of years of Orthodontic Practice

Your answer \_\_\_\_\_

Number of years of Orthodontic Practice

Your answer \_\_\_\_\_

Region of India in which College/Hospital or Practice \*

North Eastern

Eastern

Northern

Western

Central

Southern

Other: \_\_\_\_\_

Email Address \*

Your answer \_\_\_\_\_

Back Next

Fig 3: Demographic details information



<p>1. Do you think the COVID-19 pandemic will affect the overall number of patients seeking Orthodontic treatment ?</p> <p>a) May reduce, however by negligible amount : 0-10%</p> <p>b) May reduce by a mediocre amount : 10-30%</p> <p>c) May reduce by a significant amount : 30-60%</p> <p>d) Not a major difference - almost the same</p> <p>e) Might Increase</p> <p>2. What will be your major point of focus for convincing patients for Orthodontic treatment?</p> <p>a) Focus more on Esthetics than Function.</p> <p>b) Focus more on Function than Esthetics.</p> <p>c) Both of the above.</p> <p>3. Do you think the usage of PPE kits along with Face shields and masks will suffice and be thoroughly protective for the orthodontist to perform all procedures and restrict the spread of infection?</p> <p>a) Yes indeed very safe.</p> <p>b) Safe however to a certain extent and manageable.</p> <p>c) Not entirely safe and there is a huge risk of spread of infection.</p> <p>d) Not at all safe to perform all procedures.</p> <p>4. What precautions are you planning to take in your area of operation?</p> <p>a) Using disposable plastic coverings.</p> <p>b) Cleaning with chemical disinfectant like 1% Sodium Hypochlorite.</p> <p>c) Fumigation or fogging the area with disinfectants like Sodium Peroxide or <math>Kmno_4 + HCHO</math>.</p> <p>d) All of the Above.</p> <p>e) Other</p> <p>5. How do you think the additional cost of sanitation and protective gear can or should be procured ?</p> <p>a) Should be borne in entirety or majorly by the orthodontist.</p> <p>b) Should be borne in entirety or majorly by the patients.</p> <p>c) Can be divided between both in a 50-50 ratio.</p>	<p>6. Which treatment systems will you be interested more in convincing the patients that come to you now ?</p> <p>Metallic brackets</p> <p>a) Ceramic brackets</p> <p>b) Self ligating system</p> <p>c) Lingual system.</p> <p>d) Aligners.</p> <p>7. Do you think COVID-19 situation will give an impetus to Digital schemes like Virtual consultations, Tele-Orthodontics etc ?</p> <p>a) Yes - however it will only be transient</p> <p>b) Yes- it is here to stay for quite a long time</p> <p>c) No- it can not replace physical consultations</p> <p>8. What will the overall expected price hike Post Covid in Orthodontic Treatment ?</p> <p>a) up by upto 10%</p> <p>b) up by 10-20%</p> <p>c) up by 20-30%</p> <p>d) No substantial hike</p> <p>9. Which procedures do you think will pose to be at a higher risk when it comes to transmission of infection?</p> <p>a) Bonding and Banding.</p> <p>b) Debonding and Debanding.</p> <p>c) Changing of wires and ligatures/modules.</p> <p>d) Miniscrew insertion.</p> <p>e) Other</p> <p>10. Which of the following modalities would you prefer to use in order to increase the inter-appointment time for your patients so as to accelerate tooth movements?</p> <p>a) Drugs like parathyroid hormone, 1,25 Dihydroxy Vitamin D3 etc.</p> <p>b) Surgical methods like corticotomy, Piezocision etc.</p> <p>c) Device assisted methods like using Accelerated Device, Laser Therapy etc.</p> <p>d) Changes in armamentarium like CuNiti wires and bracket systems.</p> <p>e) Other.</p>
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Fig 4: Survey questions

## Result

### • Sample Characteristics

The final sample size comprised of responses from 346 Orthodontists from all around India. Around 550 Google form questionnaires were sent to Orthodontists –Both Private practitioners as well as Post Graduate students enrolled in the course of Orthodontics in various universities of the country.

### • Clinical work Setting of Orthodontists

The preponderance of responses- 69.7% was attained from the students inscribed in Post Graduate Programs in Institutions spread all over the nation. The other 30.3% respondents were Orthodontic Practitioners having either a self-owned clinical practice or being associated with some educational institution or else being a consulting Orthodontist to other dental clinics (Table-1). All in all they were engaged in some form of independent practice.

Table 1: Demographic Distribution of Samples based on Work setting and Region of Practice

Total Respondents	346	(in Percentage)
<b>Distribution of Sample According to Clinical Work Setting of Orthodontist</b>		
Post Graduate Students	241	69.7%
Private Practitioners	105	30.3%
<b>Distribution of Sample According to Region of Practice</b>		

Western India	149	43.4%
Southern India	115	33.5%
North India	44	13%
Central India	23	6.9%
Eastern India	14	4.3%
North East India	1	0.3%

Amongst the Student Respondents – the major 54.2 % comprised of students in the final year of their Post Graduate Program. Also, in terms of experiences of all the respondents, we achieved a humongous range consisting of years of practice from 0 up to 50 years of practice. This range thus will provide varied discernments from Orthodontists based on their different clinical experiences.

**• Region of Practice**

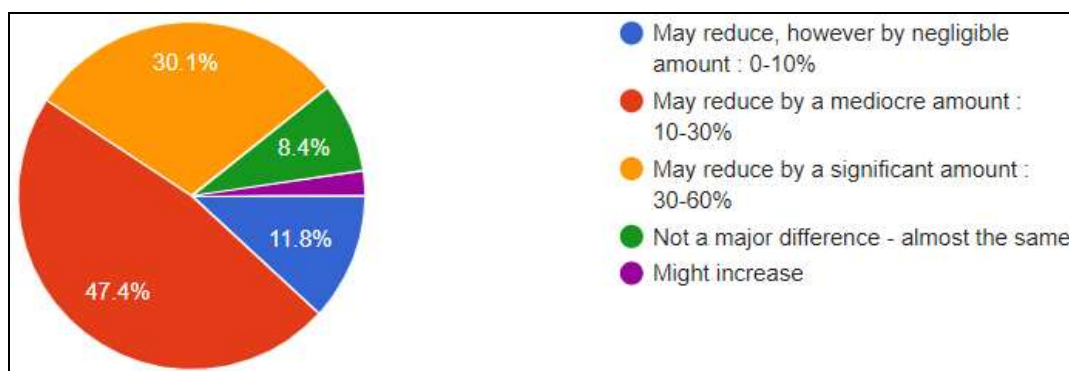
This survey intended to gain responses and perceptions from not a specific region or an area, but the entire country. Thus the responses achieved were Pan-India comprising of 43.4% from Western India, 33.5% from southern India, 13% from

North India, 6.9% from Central India, 4.3% from Eastern India and 0.3 from the North Eastern Area.(Table-1) Thus, this helped us in assimilating views from Orthodontists working in different Arenas.

**Survey Question Responses**

**1. Effect on number of patients seeking treatment**

The majority 47.4% of respondents were in the opinion that the number of patients seeking treatment would only reduce by mediocre (10-30%) amount whereas as per the other 30.1% it may reduce by a significant (30-60%) amount. Also only a mere 2.3% thought that the number of patients might increase. (Figure-5)

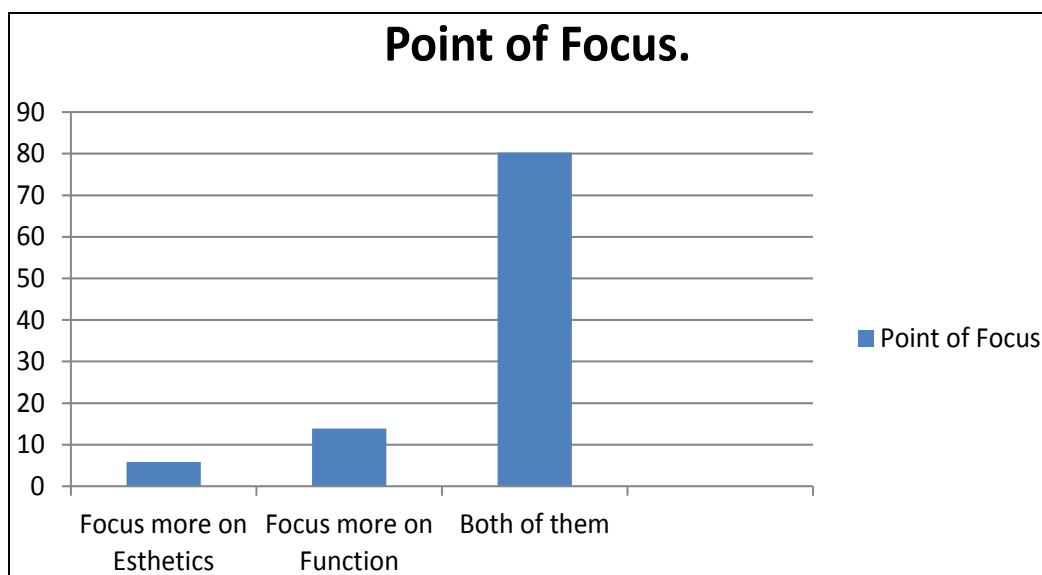


**Fig 5:** Effect on number of patients seeking treatment

**2. Major focus for convincing patients for treatment**

The major bulk of respondents 80.3% said that the point of focus would invariably be both – Esthetics and function when

it came down to convincing patients for orthodontic treatment. Only a minor 5.8 % would focus more on Esthetics than Function. (Figure-6)



**Fig 6:** Major Focus for convincing patients for treatment

**3. Protective gear for the Orthodontist**

An absolute majority 59 % of Orthodontists believed that the use of PPE kits along with Face shields and masks are Safe

however to a certain extent and manageable. 25.1 % however believed that they are not entirely safe and there is a huge risk of spread of infection. (Figure-7)

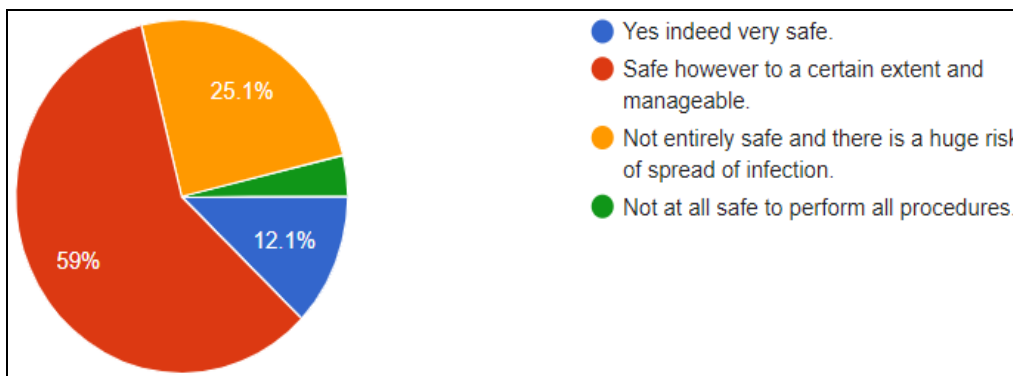


Fig 7: Protective Gear for the Orthodontist

**4. Precautions in the area of operation**

Various diverse views and opinions were received in terms of the precautions to be taken in the area of operation. Maximum number of orthodontists 78.3 % responded saying that they would take all necessary precautions namely using disposable plastic coverings, cleaning with chemical disinfectants as well as fumigating the area.

**5. Procurement of additional cost of sanitation and protective gear**

68.2% orthodontists who comprised of the majority were in the view that the cost of additional sanitation and protective gear should be procured from both the Orthodontist and the Patient in a 50-50 ratio. 23.4% however thought that this amount should be borne in entirety or majorly by the Patients only. (Figure-8)

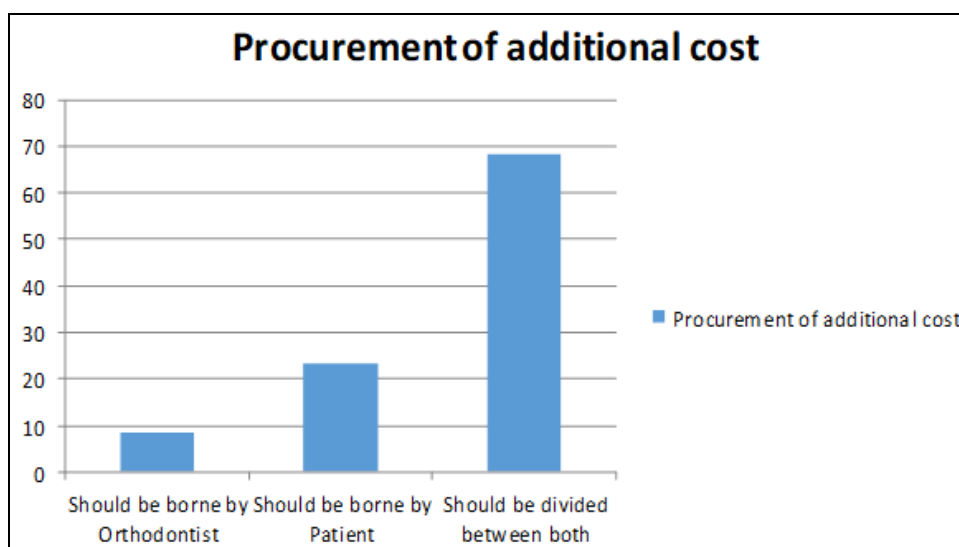


Fig 8: Procurement of additional cost

**6. Treatment systems of interest post COVID**

37% of the respondents aimed at convincing the patients more for self-ligating systems. Almost in the same proportion, 34.7

% orthodontists were in the view of convincing patients for Aligners. No response was achieved in affirmation for the Lingual System. (Figure-9)

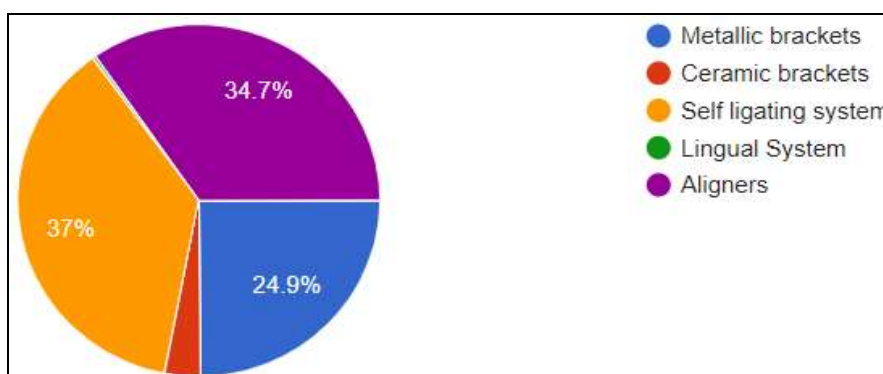


Fig 9: Treatment systems of interest Post COVID

**7. Digital Schemes Uproar**

Nearly half of the respondents 48% firmly believed that the digital scheme uproar will without a doubt be there, however

it will only be transient. Also, 31.2 % of them believed that it can definitely not replace physical consultations. (Figure-10)

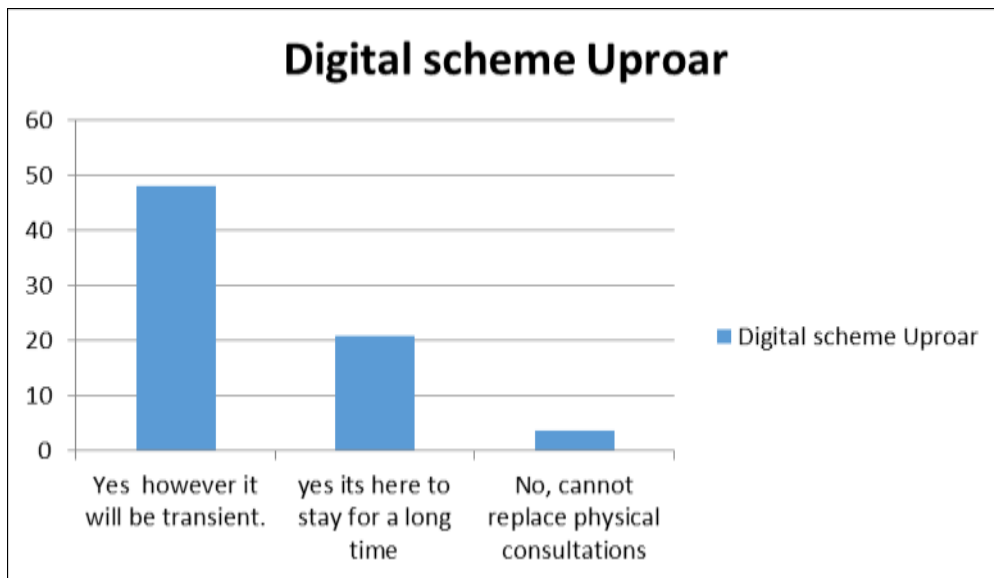


Fig 10: Digital scheme uproar

**8. Expected Price Hike**

Almost half 48% of the respondents expected that the price hike would be around 10-20%. Around the same 30.3%

believed that the price hike would be around 20-30 %. Only a meager 8.4% thought that there would be no substantial hike. (Figure-11)

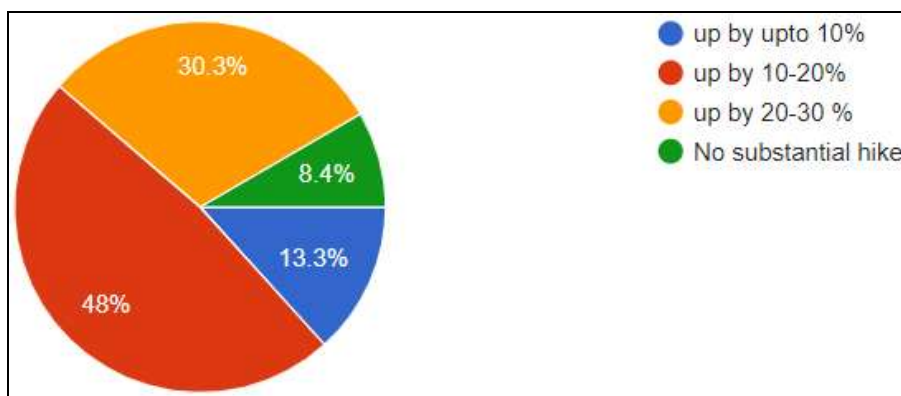


Fig 11: Expected Price hike

**9. Transmission of infection through procedures**

Majorly almost 2/3<sup>rd</sup> of the respondents claimed that the maximum risk of transmission of infection is through debonding and debanding procedures, followed by bonding

and banding procedures as claimed by around half of the respondents (51.4%). The least risk of transmission was believed to be through changing of wires and ligatures/modules. (Figure-12)

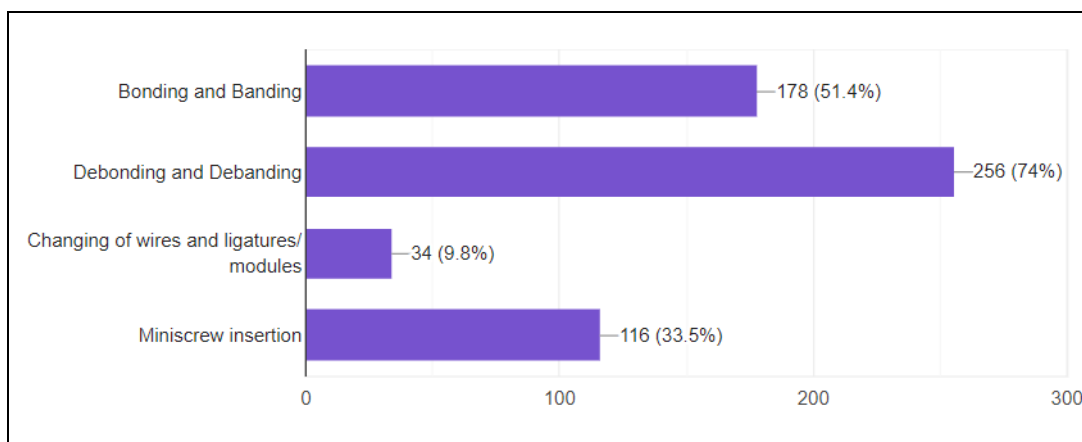
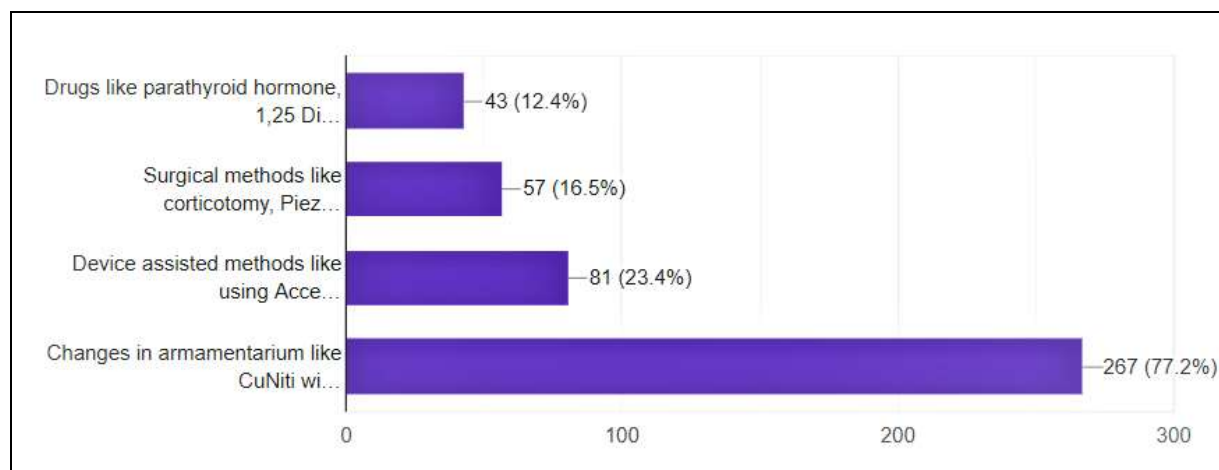


Fig 12: Infection Transmission through procedures

**10. Modalities to increase interappointment time**

77.2 % Majority response was in lieu of changes in armamentarium like using CuNiti wires and bracket systems.

The least response 12.4 % was in favor of using drugs for the same. (Figure-13)



**Fig 13:** Modalities to Increase Interappointment time

## Discussion

This Study was designed to have a broad view about the perception and apprehensions of Practicing Orthodontists and Post Graduate students working in this extraordinary situation by the means of a Pilot survey. The Study is one of its kind with a mix of Questions including various aspects of Clinical Practice including effect on number of patients seeking treatment, focus for convincing patients for treatment, protective gear for the orthodontist, precautions in the area of operation, procurement of additional cost of sanitation and protective gear, treatment systems of interest post COVID, digital schemes uproar, expected price hike, transmission of infection through procedures and modalities to increase interappointment time. The authors are fully aware that these responses are transient and the same respondents may feel differently on the same aspect after few months into the Pandemic and other relaxations. A follow up study is required with the same questions with the same sample to get a more realistic idea about the perception of the Practitioners at the peak and a few months into the Pandemic. This is a limitation of this study.

Both Private Practitioners and Post Graduate students enrolled in the course of Orthodontics in various universities of the country were included. The main motive was to gain a mixed response from orthodontists of all age groups as well as working in varied clinical settings. To increase the heterogeneity of study and for a more authentic and diverse response the Survey was extended Pan India comprising of 43.4% from Western India, 33.5% from southern India, 13% from North India, 6.9% from Central India, 4.3% from Eastern India and 0.3% from the North Eastern Area.

When we asked the respondents about their thoughts regarding the impact of the Pandemic on number of patients seeking Orthodontic Treatment, the majority believed that the number will go down in moderate amount but not that significantly while only a small number was hopeful that it will increase. This may be only the transient effect of the Pandemic and with easing of restrictions in various containment zones across the country the responses may vary. Regarding the focus on convincing the patients for seeking Orthodontic treatment, most of the Practitioners still believed in conventional ideals of balance of function and esthetics while a tiny minority would focus more on Esthetics which suggests that our basic Orthodontic Principles are still unshakable even in a Pandemic.

When the respondents were questioned on their approach regarding their own safety and precautions be it about

wearing Personal Protective Equipment or face shield and sanitation of the working area, it was suggested that the Orthodontists are quite vigilant and willing to take all possible extra safety measures. When it comes to bearing costs of all these measures, majority of Orthodontists are willing to share the burden equally with Patients suggesting the cost of OPD and treatment will see only a minor increase transiently and may be permanently due to certain restrictions in Imports and price hike of raw materials.

The Participants reverted on their choice regarding the Treatment systems they would prefer in the Post COVID situation in a way that there were almost equal proponents for Self Ligating bracket systems and Aligners, while the Lingual Bracket System didn't gain that much traction. It would be interesting to see if this is a persistent thought or just a transient reaction to the current situation. The probable reason for this could be the reduced appointment time and increased inter appointment time in these systems.

When the respondents were quizzed about their views regarding Digital Systems for Patient Consultation, Diagnosis, Treatment Planning and other aspects of the Clinical practice, a majority firmly believed that this trend towards digital Orthodontics will continue Post COVID but even they were not sure about the longevity of it, while a fair number still believe that Conventional Physical Practice can't be replaced. When we asked the respondents about their apprehensions regarding the risk of transmission through various Orthodontic Procedures, the Debonding and Debanding Procedures carried the maximum risk followed by Bonding and Banding Procedures with least risk in changing wires and modules. This is mainly because aerosol production is inevitable when carrying out Debonding and Debanding procedures.

Also another question was asked regarding their preferred mode to increase inter appointment time to which a majority believed the use of Armamentarium like CuNiti and bracket systems like Self Ligating while use of Drugs like Parathyroid hormone etc was favored by only a small percentage. This reluctance towards using drugs to reduce treatment time can be attributed towards insufficient literature on the subject and reluctance of patients and practitioners to risk the possible rare side effects.

## Conclusion

1. It is anticipated that Post COVID the number of overall patients seeking treatment might reduce in totality, however by a moderate amount majorly.



- Irrespective of any situation giving rise to a crunch, the ethicality of the profession will not be affected in terms of convincing patients by focusing on both Esthetics and Function.
- For the Orthodontist, the mandatory protective gear consisting of PPE kits, Face shields and masks are perceived to be safe for a majority of procedures and manageable to an extent.
- The precautions in the area of operation should be at least aimed at disinfection and fumigation along with providing protective disposable gear for the patients so as to limit the spread of the infection.
- With the purpose of keeping Orthodontic Treatment relatively Cost Effective, it is preferable to split the additional cost of safety measures in an equal ratio between the Orthodontist and the Patient.
- The major treatment system of interest in this current pandemic scenario would be the Self Ligating system followed by Aligners.
- The digital scheme of communication that is pacing up and making its place in the Orthodontic practice will be Transient only.
- Price hike in the Orthodontic treatment is expected, however this hike would be by a meager 10-20 percent.
- Maximum risk of infection transmission to the Orthodontist is by means of Debonding and Debanding procedures.
- Changes in the Orthodontists' armamentarium is sought to be the most favoured modality to increase the Inter appointment time.
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