

Original Article

Perspective of dental health-care professionals during the second wave of COVID-19 pandemic: A national online survey

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ABSTRACT

Objectives: COVID-19 pandemic has shown a substantial impact on the entire world both physiologically and psychologically. By the hit of the second wave, which opened dangerous gates for secondary infections, apprehension was carried among health-care sectors. These secondary infections were due to decreased immunity. On the other hand, risk modifiers, such as diabetes and hypertension played a leading role in the mortality rate. A substantial number of studies have not been conducted so far regarding the impact of this second wave on dental healthcare professionals. The present study aimed to evaluate the dental healthcare professionals' perspective levels during the second wave of the COVID-19 pandemic through a web-based survey.

Material and Methods: A total of 853 responses were gathered by sending 15 questions in Google forms. Data collected were gathered and subjected to statistical analysis, expressed in frequency distribution and Pearson's Chi-square test was performed.

Results: Data obtained and projected that the study population expressed higher anxiety and stress levels, despite which many of them showed an inclination to work during these tough times. The knowledge about secondary fungal infections like Mucormycosis, which was caused due to immune suppression, was abundant among the participants. A significant proportion conveyed the ill effect of COVID-19 on clinical practice and academics as well.

Conclusion: Dental professionals have shown a positive perspective despite of higher stress levels and being a part of frontline workers, they are much primed to assure, educate, and treat the patients amidst the COVID-19 pandemic.

Keywords: COVID-19, Dentists, Mucormycosis, Surveys and questionnaires

INTRODUCTION

The entire mankind was cuffed by the unsung sickness due to tiny creatures landing as a pandemic, the slams of which were not easy for the world to deal with for ages. In the present scenario, one such crisis being experienced by the entire human race is Coronavirus Disease (COVID-19)/novel coronavirus/2019-nCoV/SARS-CoV-2. The World Health Organization (WHO) declared it as a global pandemic in March 2020.^[1] The first outbreak was in Wuhan city of China, and gradually spread to the entire world, which has taken nearly 5,531,069 (as of January 15, 2022) lives so far according to the WHO. Severely infected patients feel difficulty in breathing, chest pain, and cytokine storms, affecting the lungs and various other body parts finally leading to acute respiratory distress and death.^[2]

After two decades of infections such as SARS-CoV, Middle East respiratory syndrome CoV, and currently, with the

SARS-CoV-2, frontline workers have been overburdened, experiencing alarming stress levels, depression, and psychological abnormalities. Dental professionals are among those who carry a higher risk of infection due to their direct exposure to droplets, saliva, and other body fluids including the production of aerosols during therapy which, in turn, carries the risk of virus transmission.^[3,4] In support of this, Liu *et al.*^[5] gave a possibility of isolation of the virus in salivary epithelial cells. Even, Barzon *et al.*^[6] published the presence of the virus even after 29 days of recovery. The reason salivary fluid is highly contagious is due to a greater number of angiotensin-converting enzyme-2 receptors in the salivary gland and it is highly impossible to avoid its contact during dental treatment. Moreover, nasal and throat swab tests that were being performed are not reliable to some extent. Thus, it caused a greater impact in the field of dentistry. In support of

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this, a recent study done by Shetty *et al.*,^[7] in 2020, concluded that long-term unknown stress has shown effects of morbidity and fatigue on dental healthcare professionals.

There was a drop in the count of cases by January 2021 but due to mutagenic nature of the virus, more powerful strains emerged (esp., Delta strain) leading to the rapid spread of infection and resulting in the second wave of pandemic. The government has not relaxed double mask protocols, social distancing, and lockdowns. All these were done to control the spread of the disease.^[8] Apart from this, mass vaccination programs have already been implemented by the governing bodies for the general population including frontline workers.^[9] The deteriorated situation has tremendously affected the citizens both physiologically and psychologically. One among them was dental healthcare professionals who are more prone to getting infected. The fear of transmitting it to their family has always been a hunted factor and financial disturbances were also unavoidable.^[10] This led to a tremendous change in their perspective levels regarding the COVID-19 second wave. As considerable numbers of studies were not performed, the present study aimed to evaluate the perspective levels of dental healthcare professionals in the second wave through an online-based questionnaire survey.

MATERIAL AND METHODS

Based on an initial pilot study on 25 dentists, the obtained Cronbach's alpha value was 0.74 [Table 1]. For including maximum responses, convenient sampling (where dentists were contacted by the investigators themselves) and snowball sampling (further dentists were asked to forward the questionnaire to their contact dentists and this procedure goes on further) were used in the present study.

The present study was a nation-wide, open, randomized, qualitative, descriptive, and validated^[11] online cross-sectional questionnaire survey. The sample was gathered by sending the Google link (<https://forms.gle/UfKxTuEwyZssZoKt9>) to all dental professionals across India through electronic means and no specific time frame was allocated. This consists of two sections; the first section consists of demographic data while the second section consists of 15 questions [Figures 1 and 2] that were used to assess the perspective levels of dental professionals regarding the second wave of the COVID-19 pandemic.

Table 1: Depicts the Cronbach's alpha calculation table based on initial pilot study.

Parameters	Values
Number of items (questions) (k)	15
Sum of item variance (K-1)	10.8576
Variance of total score	35.28
Cronbachs alpha	0.741691
Inference : 0.70–0.79 (Acceptable)	

Inclusion and exclusion criteria

Dental healthcare professionals aged >20 years, and who were willing to participate were included in the study. Medical professionals and dentists who gave irrelevant responses and were not interested were excluded from the study.

A total of 1000 responses were received, 853 were included, and 247 responses were eliminated due to improper filling of Google form, irrelevant answering, some were not interested in giving their age and some rejected to fill the form. After gathering a required sample, Google forms link was disabled, and an excel spreadsheet was prepared.

Statistical analysis

Statistical analysis was performed using Pearson's Chi-square test on SPSS version 22.0, IBM Pvt Ltd, Chicago Illinois, USA, and an association was established when $P < 0.05$.

RESULTS

[Graph 1] depicts the percentages of respondents regarding the age groups (>30 years [166] 19.46% and ≤30 years [687] 80.54%), gender (males [251] [29.43%] and females [602] [70.57%]), education BDS (571) (66.94%) and MDS (282) (33.06%), specialty (Conservative dentistry and Endodontics [33] [11.71%], Oral and Maxillofacial surgery [22] [7.80%], Oral Medicine and Radiology [14] [4.96%], Oral Pathology [4.26%], [12] Orthodontics [29] [10.28%], Pediatric and Preventive Dentistry [16] [5.68%], Periodontics [138] [48.94%], Prosthodontics [12] [4.26%] and Public Health Dentistry [6] [2.13%]) and profession whether student/clinician, academician or both clinician and academician (Academics [30] [3.52%], both clinician Academics [120] [14.07%], Clinician [164] [19.23%], and Students [539] [63.19%]).

In the present study, the age group variation (>30 and ≤30 years comparison) [strongly agree] has shown a significant difference ($P = 0.004$) for higher risk of exposure to deadly viruses such as COVID-19 and second wave was more worrying than first wave ($P = 0.001$). Values were statistically significant ($P = 0.001$) in age group variations (>30 and ≤30 years comparison) [agree] that vaccination could prevent people from getting infected. Significant ($P = 0.001$) agreement was also recorded regarding the vaccination drive that the population was hesitant to take and participate in the drive. A significant amount of the study population was vaccinated ($P = 0.002$) and has an idea of any best available vaccine ($P = 0.001$). The present study results also showed statistical significance ($P = 0.001$) regarding increased nervousness and anxiety levels in dentistry fields in age group variations (>30 and ≤30 years comparison) [Graph 2].

Regarding the gender-wise comparisons, statistically significant results were recorded for vaccination which can prevent and

PROFORMA TITLE:
Perspective Levels of Dental Healthcare Professionals During Second Wave of COVID-19 Pandemic : A National Online Survey

- 1. Do you agree that dental care professionals are at high risk for the exposure to the deadly infectious viruses like SARS / COVID-19?**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree
- 2. Does the Second wave of COVID-19 is different and more worrying when compared to the first wave?**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree
- 3. Do you think that the elections, cricket matches, religious gatherings etc., are some of the main causes for the rapid spread of this second wave?**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree
- 4. Does Vaccination can save and prevent the people from getting infected?**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree
- 5. Despite the vaccination drive, many people including some of the health care professionals felt hesitant in taking the vaccine shot. Do you agree or not?**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree
- 6. Have you got your COVID 19 vaccination done?**
a. Yes b) No c) Registration done d) Not interested
- 7. Which vaccine is best for getting vaccinated in this present scenario?**
a. Covishield b) Covaxin c) Sputnik –v d) Any vaccine that is readily available at your place
- 8. Due to LACK OF TRANSPARENCY in the rationale of vaccine and its post immunisation effects, it added fear even to the educated people.**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree

Figure 1: Depicts the questions from 1 to 8.

- 9. Does COVID-19 treatment make the immune system more vulnerable to other infections, including black fungus?**
a) Yes b) No c) May Be (due to person's weak immune system) d) None of the Above
- 10. Does COVID situation has increased the nervousness and anxiety levels in dentistry field?**
a) No b) Mild c) moderate d) Severe
- 11. Did COVID-19 effect the life style and not able to stop / control the worrying?**
a) Agree b) Strongly agree c) Disagree d) Strongly disagree
- 12. Did the outbreak of COVID-19 affect your academic year and /or clinical practice?**
a) Yes b) No c) May Be (due to person's weak immune system) d) None of the Above
- 13. Do you want to treat dental patients during this COVID pandemic situation?**
a) Yes b) No c) May Be (due to person's weak immune system) d) None of the Above
- 14. Do your family members worry that they might get infected through you?**
a) Yes b) No c) May Be (due to person's weak immune system) d) None of the Above
- 15. LEVEL OF CHANGE in your personal hygiene and care (face mask, PPE kit etc.) during this COVID pandemic?**
a) No change b) Little Changed c) Moderately Changed d) Greatly Changed

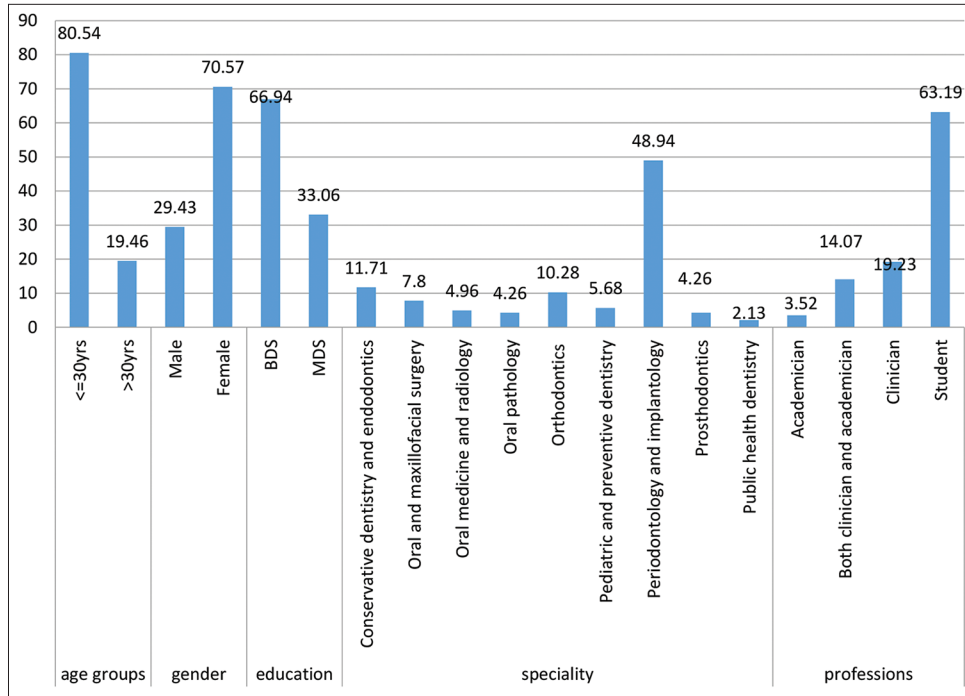
Figure 2: Depicts the questions from 9 to 15.

save from getting infected ($P = 0.001$), despite the vaccination drive many people including health care professionals were hesitant to take vaccine ($P = 0.001$). Further, significance was also recorded that females were relatively vaccinated more in numbers ($P = 0.001$) and Covishield was reported as the type of vaccine that was received by a significant number in the study population ($P = 0.006$). Except for questions 4, 5 and 7 remaining questions were statistically insignificant when gender-wise distribution was compared [Graph 3].

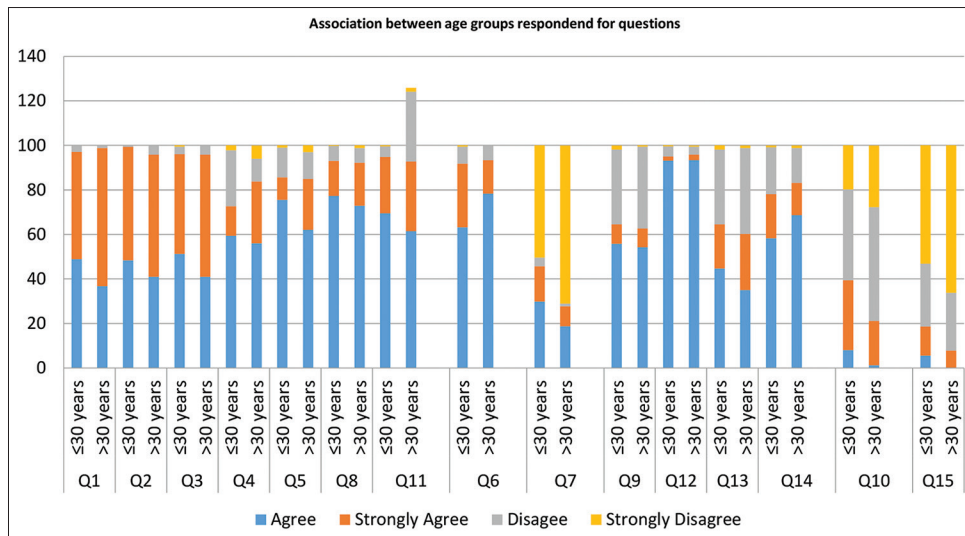
When statistical comparisons were performed between BDS and MDS individuals, statistical significance was recorded for dental professionals who are at higher risk of exposure to deadly virus infections such as COVID-19 ($P = 0.009$). Significance was also recorded that the COVID-19 second wave was more worrying than the first wave ($P = 0.007$). Most dentists in the present study significantly agree that

people were hesitant to get vaccinated including health care professionals ($P = 0.001$). A significantly higher number of the study population was vaccinated ($P = 0.001$) and all dentists significantly ($P = 0.001$) reported that any available vaccine at your place would be best. Anxiety and nervousness levels and significant values were recorded when BDS and MDS responses were compared ($P = 0.001$). A significantly higher number of dentists were interested to treat patients during the COVID-19 pandemic ($P = 0.003$) and there was a significant change in the level of personal hygiene when BDS and MDS individuals were compared ($P = 0.001$) [Graph 4].

Regarding comparisons between clinicians and students, statistical significance ($P < 0.05$) was obtained for dental professionals who were at high risk, the second wave was different and more worrying, rapid spread, vaccination can prevent disease, vaccination drives, best vaccine, lack of transparency,



Graph 1: Depicts the demographic data of the study respondents in percentages.



Graph 2: Depicts the association of age groups (≤30 and >30) with responses for each question regarding COVID-19. For Q6 instead of agree, strongly agree, disagree, and strongly disagree options – Yes, No, Registration done, and not interested were considered while for Q7,9, 12-14 options are Yes, No, May be, and None of the above; For Q10 – No, mild, moderate, and severe; For Q15 – No change, Little change, Moderately changed, and Severe change.

lifestyle affecting, change in hygiene, and family worrying, while remaining were non-significant ($P > 0.05$) [Table 2].

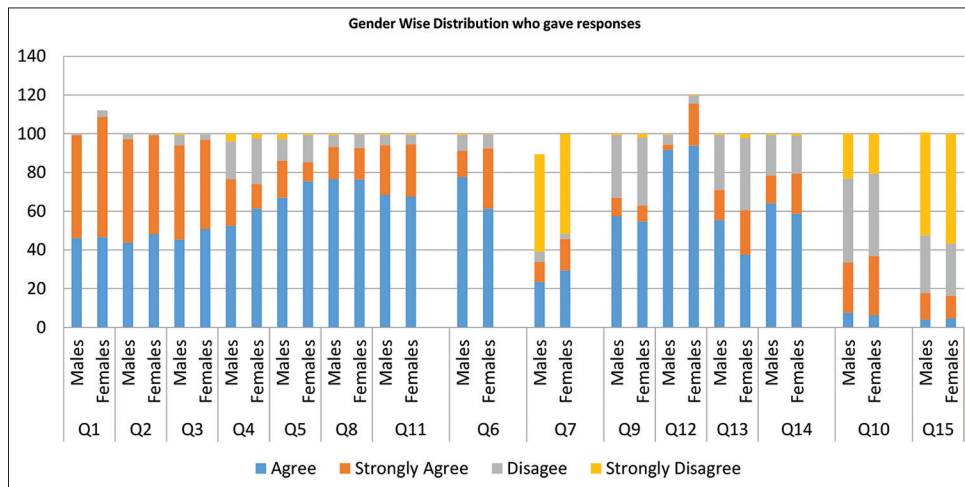
DISCUSSION

Dental professionals are at higher risk and stress of contracting infection due to their close approximation to the oral cavity

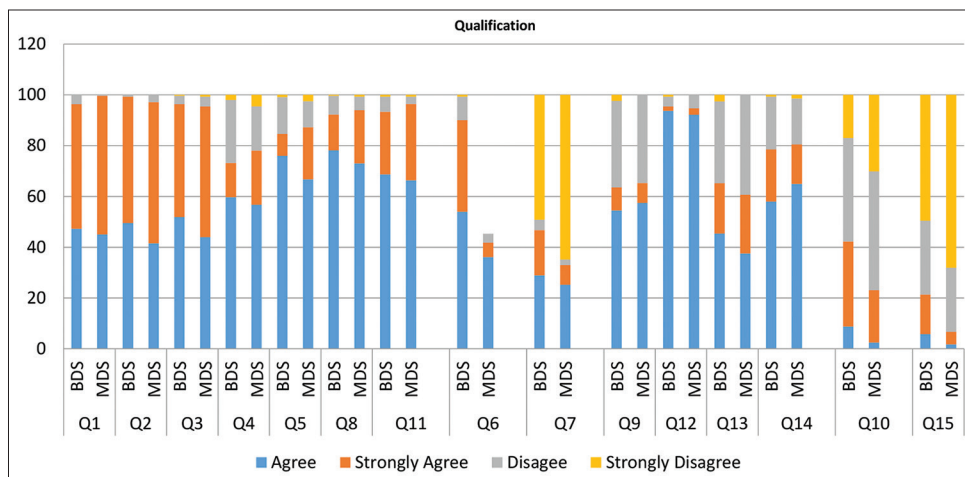
as a part of time-consuming therapies.^[12] In the present study, younger age group, females/or clinicians (33%), and from clinical departments had given higher responses superior to the studies done by Hussein *et al.*,^[13] 2020 and Lugito *et al.*,^[14] 2020 and inferior to Shetty *et al.*,^[7] and Kamate *et al.*,^[15] 2020 which might be due to variation in the study sample size and

apprehensive nature of females toward health care. Apart from this, higher occurrence of undiagnosed asymptomatic cases, aerosols generation, and saliva contact may lead to contraction of infection in dentists and supporting staff. Moreover, regarding the nerve-racking circumstances (elections, sports events, and religious gatherings) during the second wave of COVID-19, 43–55% of dentists (overall, age/gender-wise, and educational qualification) agreed that it was a much worrisome and fearful condition which had shown greater impact on the spread of virus. Fear of isolation centers and social stigma led to an asymptomatic spread.^[16] The mortality rate has also increased within a shorter span, causing more fear in the population.

The current study revealed that 54.4% of dental professionals choose the option of a readily available type of vaccine to be taken during vaccination drive. These results are by Islam *et al.*,^[17] in 2021, who conducted an awareness study among residents in Delhi and reported that 72% study population were ready to take vaccines and more than 50% were ready to pay for the vaccines. Apart from this, 72% of the population stated that vaccination jabs should be given first to frontline workers. Thus, dental professionals being one of the frontline workers received their vaccination in the first sets and this was the main reason for higher percentages of vaccination. In support of this, Shacham *et al.*,^[18] in 2021, concluded that



Graph 3: Depicts the association of gender with responses for each question regarding COVID-19. For Q6 instead of agree, strongly agree, disagree, and strongly disagree options – Yes, No, Registration done, and Not interested were considered, while for Q7,9, 12-14 options are Yes, No, May be, and None of the above; For Q10- No, mild, moderate, and severe; For Q15 – No change, Little change, Moderately changed, and Severe change.



Graph 4: Depicts the association of qualifications between BDS and MDS with responses for each question regarding COVID-19. For Q6 instead of agree, strongly agree, disagree, and strongly disagree options – Yes, No, Registration done, and Not interested were considered while for Q7,9, 12-14 options are Yes, No, May be, and None of the above; For Q10-No, mild, moderate, and severe; For Q15-No change, Little change, Moderately changed, and Severe change.

Table 2: Depicts the significant values of all the questions when students and clinicians were compared.

Question number	Student versus Clinicians Chi-square association P value
Q1	0.000*
Q2	0.000*
Q3	0.000*
Q4	0.000*
Q5	0.000*
Q6	0.000*
Q7	0.000*
Q8	0.003*
Q9	0.721 [#]
Q10	0.01*
Q11	0.0001*
Q12	0.0842 [#]
Q13	0.2525 [#]
Q14	0.0009*
Q15	0.000*

P<0.05 considered to be statistically significant, *Significant,
[#]Non-significant, Q: Questions

dentists have more awareness with a positive attitude toward vaccination than hygienists. Contrastingly, in the present study, 72–76% of dental professionals agreed that due to lack of transparency in the rationale of vaccines and their post-immunization effects, added fear even to educated people. Mucormycosis is a serious but rare fungal infection that is caused by a group of molds called micromycetes as per the Center for Disease Control and Prevention. Silva *et al.*,^[19] 2020, and Moorthy *et al.*,^[20] 2021, stated that this infection mainly affects those individuals who have compromised immune systems and those treated with steroids had a significantly increased risk for fungal infections like Mucormycosis. In the present study, 54–58% of dentists reported that COVID-19 treatment had effects on the immune system causing more vulnerability to infections like Mucormycosis (Black Fungus).

In the present study, 57–68% of dentists felt that their family members can get infected through them which is to Shetty *et al.*,^[7] 2020, Kamate *et al.*,^[15] 2020, and Lugito *et al.*,^[14] 2020, where they reported that dentists have higher fear of contraction of risk because reporting of patients to clinics would be disastrous, as individuals might be asymptomatic or pre-symptomatic.^[21] Moreover, dental treatments cause droplet transmission and aerosol production which might transfer the infection to various other sites and regions.^[22] The current study population has also shown a huge impact (nearly 93.2%) on academics and clinical practice, even then 42–55% of dentists were willing to treat patients and lend their helping hand. This is by a recent multi-national survey done by Abdelrahman *et al.*,^[10] 2021, shown that clinical practice was affected due to the closure of clinics mostly in private sectors compared to non-private sectors. The main reason behind this can be the lack of

proper guidelines regarding dental treatment, the rapid spread of infection, and a greater number of positive cases.

The current study results also reported that there was a great change in the level of oral and general hygiene. In clinical practice, while dealing with dental emergency procedures, dental professionals make shorter appointments, usage of Personal Protective Equipment kits, proper mouth masks, and pre-procedural rinsing of the oral cavity using povidone-iodine or chlorhexidine gluconate or essential oil mouthwashes which would reduce the viral load and reduce that the spread of the disease has become a part of daily routine dental practice. In support of this, a study was done by Elzein *et al.*,^[23] 2021, concluded that povidone-iodine and chlorhexidine gluconate were effective as pre-procedural rinses against salivary SARS-CoV-2.

According to Marouf *et al.*,^[24] 2021, it was clearly stated that periodontitis was associated with a higher risk of ICU admission, assisted ventilation and death of COVID-19 patients. Oral diseases such as gingivitis, periodontitis, caries, abscess of the oral cavity, and poor oral hygiene will create an environment for COVID-19 to show a severe problem.^[25] This was even supported by the European Federation of Periodontology and a study done by Pitones-Rubio *et al.*,^[26] 2020, where it was concluded that periodontitis patients had a greater risk for COVID-19 infection contraction. Dental professionals should also participate in telephonic and video consultations so that patients will get proper guidance to brush their teeth, and reduce plaque and calculus which, further, reduces inflammation leading to good oral hygiene.^[25]

Limitations of the present study were multinational survey conductance, statistical comparisons were not performed for individual geographical areas, and greater younger people participated in the study. Lesser postgraduate and clinicians took part in the study.

CONCLUSION

Within the limitations of the present study, dental professionals have a positive perspective regarding the COVID-19 pandemic despite higher anxiety and stress levels which were seen particularly in females. Clinicians have better perception than students regarding the pandemic situation due to their regular clinical practice and up-to-date knowledge. Most dental professionals got vaccinated and had an idea regarding the type of vaccine to be taken. Apart from this, there is the responsibility of dental professionals to educate patients and the general population regarding this panic situation and to give assurance within their constraints to their patients. Further, future recommendations are necessary for doing more research on the fungal infections in COVID-19 patients which are mandatory to increase the robust surveillance of the high-risk hosts during this pandemic.

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Declaration of patient consent

Institutional Review Board (IRB) permission was obtained for the study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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