



The Impact of COVID-19 Pandemic on Dental Practice and the Acceptance and Attitude of Indian Dental Professionals towards COVID-19 Vaccine – A Cross-Sectional Observational Survey

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJRID/2022/v9i430276

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/86255>

Short Research Article

Received 12 March 2022
Accepted 21 April 2022
Published 26 April 2022

ABSTRACT

Aim: This study aims to evaluate the acceptance, accessibility, experiences, side effects and attitude of dental professionals after administration of the vaccine and their perspective regarding the effect of COVID-19 on dental practice and patient education.

Materials and Methods: This survey is based on the questionnaire that was conducted among Indian dentists. The survey included questions that evaluated dentist's opinion on COVID-19 vaccination, their acceptance, knowledge, attitude, and side effects experienced if any post-

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vaccination and also their perspective regarding the effect of COVID-19 on dental practice and patient education.

Results: Overall 155 dentists contributed to this study (51% general dentists & 49% specialists). 85% of the dentists opted for COVID-19 vaccination, however, 56% of them were concerned about the side effects of the vaccine. Fever (55%) and pain at the injection site (52%) were the most prevalent side effects after the vaccine. As far as modifications done in daily practice, only 8% cases were being done considering them as most urgent.

Conclusion: Dental professionals are the reliable source of health information, their acceptance or rejection to COVID-19 vaccine can influence the general population's uptake of the COVID-19 Vaccine.

Keywords: Dentists; COVID-19 vaccine; acceptance; attitude.

1. INTRODUCTION

An outbreak of coronavirus disease which began in Wuhan, China's Hubei Province has spread all around the world and disrupted all aspects of human life. The symptoms of this disease include fever, dry cough, and fatigue; however it has higher spreading nature. The virus could spread via respiratory droplets and contaminated surfaces through the mucous membrane of the mouth, nose even via faecal-oral route [1].

This highly contagious nature of virus led many medical institutions to cancel all elective procedures to reduce the risk of spread. One of the most acutely affected sectors has been dentistry. Dental professionals are exposed to high levels of occupational hazards due to aerosols and oral fluids conferring additional risks of viral exposure and transmission [2].

The use of ultrasonic instruments and handpieces during dental procedures results in generation of saliva and blood droplets, thus resulting in contamination of Instruments and office environment. Hence both the patient and dental practitioner could be at risk of being infected. Thus the highly contagious nature of SARS-COV2 and the fact that lot of saliva and blood droplets are generated during dental procedures, it was suggested that dental practitioners limit their intervention to emergency treatment only. Strict precautionary protocols must be performed during the pandemic to reduce the risk of infection. Also to reduce the risk of transmission, rubber dam isolation, high volume saliva ejectors, anti-retraction handpieces, and personal protection equipment (PPE) should be used [3].

With the success of COVID-19 vaccine trials and its official rollout, attention has turned towards vaccine distribution and its uptake [4]. Vaccine hesitancy, one of the top 10 public health threats according to WHO, has taken a toll on

immunisation programmes globally and is a major barrier to achieving optimal vaccination goals [5]. High levels of vaccination coverage in population will be required even with vaccines that have high levels of effectiveness to prevent and stop outbreaks of coronavirus. Nevertheless; the SARS-COV-2 vaccine's availability does not symbolize the end of the pandemic due to ongoing vaccine hesitancy and anti-vaccination movements [6].

The Dental field can potentially reflect the attitude among other sectors, leading to a greater understanding of sentiments towards the vaccine and the development of plans to combat vaccine hesitancy. Dental professionals are reliable source of health information [7].

Thus, the aim of our study was to evaluate the acceptance, accessibility, experiences, side effects and attitude of dental professionals after administration of the vaccine and their perspective regarding the effect of COVID-19 on dental practice and patient education.

2. MATERIALS AND METHODS

The primary objective of this study was to evaluate the attitude and behaviour of dental professionals towards getting themselves vaccinated and to evaluate the experience and side effects if any among the dentists, post-vaccination.

Secondary objective was to evaluate the perspective of dental professionals regarding the effect of COVID-19 on dental practice and patient education.

2.1 Study Design

This survey is a cross-sectional study conducted among the dental professionals (specialist and general dentists who work in government or private sector or both) using chain referral

sampling method. Google form was used to design an online self-administered questionnaire and it was disseminated through what's app to the dental professionals. In addition, a snowball sampling technique was used to reach out to more dentists by encouraging them to forward or share the online survey link to others. This approach was adopted because of the existing nature of the pandemic as it offers social distancing and movement of researchers or participants is also restricted. Participation in the study was voluntary. The data was collected from 29.07.21 to 12.09.21.

2.2 Variables

In this study, an online questionnaire using Google forms was used to collect the data. The preliminary draft of the questionnaire was designed for this study based on experts' opinion and guidance from relevant literature. The content of the questionnaire was verified in terms of topic concepts therefore the biased, confusing and double questions were omitted. We pilot tested the questionnaire on a sample of fifteen dentists.

The survey included thirty questions divided into three sections:

FIRST SECTION: a). Primary demographic data: which includes personal information regarding age, gender, residing city. b). Specific questions: whether the respondent is a specialist or general practitioner, whether he or she is a resident or a practicing dentist and place of work- government, private or both.

SECOND SECTION: This section is comprised of closed questions (yes/no) about the dental professional's opinion on COVID-19 Vaccination, their acceptance, knowledge, attitude and side effects experienced if any post-vaccination.

THIRD SECTION: Consisted of dentist's perspective regarding the effect of COVID-19 on dental practice and patient education.

2.3 Statistical Analysis

The data was analysed in the statistical package for social science (SPSS) software v27. The descriptive analysis included frequency, percentage and standard deviations. Chi-square test was used to know the association between the covariates and the outcome. Results were considered statistically significant if the two-tailed p-value was <0.05. Considering full vaccination as a proxy variable for acceptance to

the COVID 19 vaccine, the predictors for this variable were evaluated using univariate and logistic regression analysis.

3. RESULTS

3.1 Sample Characteristics

Overall 155 dentists filled the questionnaire (51% general dentists and 49% specialists). 47% of the participants were in the age range of 20-30 years followed by 31-40 yrs (26%), 41-50 yrs (24%) and 3% belonged above 50 yrs. Among the participants 84(54%) were females and 71(46%) were males. Most of the participants (70%) were private practitioners followed by (19%) government practitioners and only 11% were both in private and government practice as presented in Table 1.

3.2 Dental Professional's Experience with COVID 19 and their Acceptance of COVID-19 Vaccine

Among all the study participants, about 57% (n = 89) of them tested for COVID-19. 85% of the participants the dentists opted for COVID – 19 vaccine and only 9% got their antibody testing done before vaccination. However, 56% of them were concerned about the side effects in relation to vaccine. Also, 63% (n = 97) of the professionals got themselves vaccinated generally and not because of the nature of their job.

There were multiple responses as far as side effects experienced by the dental professionals after vaccination is concerned. Fever (55%) and pain (52%) at the injection site were the most prevalent among the professionals followed by tiredness, myalgia, joint pain, headache and chills. Nearly 45% of the professionals took medication after vaccination to prevent occurrence of symptoms and only 21% of them became relaxed in terms of social distancing/ wearing of masks after getting vaccinated as presented in Table 2.

3.3 Factors Related to Modifications done in Daily Practice and Type of Patients being Treated during the Pandemic, Also the Factors Related to the Concerns and Encouragement of the Patients on the Uptake of COVID 19 Vaccination

About 85% of the dental practitioners were examining the routine OPD and only 3% were

doing teleconsultation. Only 8% cases were being done considering them to be the most urgent and rendering them the emergency treatment.

59% of the patients themselves were hesitant in getting the treatment done and were more concerned about the safety and efficacy of the vaccine. Only 25-50% of the patients were likely to get themselves vaccinated. 77% of the dentists opted for getting themselves vaccinated first before telling their patients to get vaccinated.

Before examining the patients 77% of the dental practitioners wore N 95 mask with surgical mask followed by face shield, gown, head cap and shoe covers.

In 26% of the cases RT PCR test was done before doing any elective procedure. In most cases, use of pre-procedural rinse 52%, use of disinfectants for surfaces, water pipes and drains before and after the procedure (50%), regular screening of the employees for symptoms of the disease (43%), disposable covers for high contact surfaces (37%), use of high volume suction (36%), half an hour gap was given between each appointment (24%) are being used as shown in Table 3.

3.4 Logistic regression analysis revealed that the odds of having more acceptance to covid vaccine were significantly greater in female dental professionals [Odds ratio (95% CI)= 4.15 (1.38-12.45)] and dental professionals with master's

degree [Odds ratio (95% CI)= 8.15 (2.31-28.79)] as shown in Table 4.

4. DISCUSSION

This study examined the acceptability of COVID-19 vaccine and the impact of pandemic on dental practice among Indian dental professionals' results of our study showed that about 5% of Indian dentists had experienced the symptoms of COVID-19 and nearly 10% of them had tested positive for COVID-19 which are similar to the study done by Nguyen et al. [1].

Besides, the 76% staffs at dental clinics are also willing and concerned about the safety and efficacy of COVID-19 vaccine. The willingness of the dentists to be vaccinated against the COVID-19 virus is 85% which is almost comparable to the study done in France which found that 77% of the participants agreed to get themselves vaccinated against COVID-19 [8]. This may be due to the notion that the dentists and the staff are particularly vulnerable to worse outcomes from COVID-19 and can create considerable fear among the general public also.

In terms of gender, we observed that more women accepted to get themselves vaccinated as compared to men. However, people most likely at risk for COVID-19 infection will accept the vaccination. Perception of risk is an inherent part of decision-making process [9,10].

Table 1. Background characteristics of participants

	N (%)
Age	
20-30 Yrs	73 (47)
31-40 Yrs	40 (26)
41-50 Yrs	37 (24)
>50 Yrs	5 (3)
Gender	
Female	84 (54)
Male	71 (46)
Qualification	
General (BDS)	79 (51)
Specialist (MDS)	76 (49)
Type of practice	
Government	29 (19)
Private	109 (70)
Both	17 (11)

Table 2. Dental Professional’s experience with COVID 19 and their acceptance of COVID-19 Vaccine

	N (%)
Have you been tested for COVID-19	
Yes	89 (57)
No	66 (43)
Have you been fully vaccinated?	
Yes	131 (85)
No	24 (15)
Did you get antibody testing done before vaccination?	
Yes	14 (9)
No	141 (91)
Did you get vaccinated only because of nature of your job?	
Yes	58 (37)
No	97 (63)
Were you concerned about any side effects in relation to vaccine?	
Yes	87 (56)
No	68 (44)
Side effects experienced after vaccination? (Multiple responses)	(% represents percent of cases)
1. Fever	61 (55.0)
2. Joint pain	30 (27.0)
3. Myalgia	39 (35.1)
4. Chills	23 (20.7)
5. Tiredness	42 (37.8)
6. Headache	28 (25.2)
7. Diarrhoea	3 (2.7)
8. Pain at injection site	58 (52.3)
9. Symptoms required hospitalization	1 (0.9)
10. None	1 (0.9)
Did you take any medicine such as PCM to prevent the occurrence of symptoms?	
Yes	70 (45)
No	85 (55)
Have you become relaxed after getting vaccinated in terms of social distancing/ wearing of masks?	
Yes	32 (21)
No	123 (79)

Table 3. Factors related to modifications done in daily practice, type of patients being treated during the pandemic, and factors related to the concerns and encouragement of the patients on the uptake of COVID 19 vaccination

	N (%)
What kind of cases are you treating in your practice?	
1. Emergency	13 (8.4)
2. Urgent	6 (3.9)
3. Routine OPD	132 (85)
4. Only teleconsultation and referral	4 (2.6)
Are your patients asking questions about the safety and efficacy of the vaccine ?	
Yes	91 (58.7)
No	64 (41.3)
Can you estimate what percent of your patients are likely to get the vaccine ?	
1. Less than 25%	25 (16.1)
2. 25%-50%	65 (41.9)

	N (%)
3. 50%-75%	47 (30.3)
4. 75-100%	18 (11.6)
What do you view as the biggest obstacle in getting patients vaccinated?	
1. Having the adequate supply of vaccine	50 (32.3)
2. Vaccine hesitancy	81 (52.3)
3. Others	24 (15.5)
What should be the most effective messaging means for those patients who are hesitant to get the vaccine?	
1. Myself vaccinated first and informing the patient that I have received the vaccine	120 (77.4)
2. Prepare a write up on importance of getting vaccinated	25 (16.1)
3. Brochures distributed to patients	10 (6.5)
What are the must-haves in your practice while treating a patient? (Multiple responses)	
	(% represents percent of cases)
1. N95 Mask with surgical mask	120 (77.4)
2. N95 Mask	35 (22.6)
3. Face shield	109 (70.3)
4. Surgical gown	105 (67.7)
5. Goggles	36 (23.2)
6. Respirator Mask	19 (12.3)
7. Head cap	97 (62.6)
8. Shoe cover	40 (25.8)
Which of the following do you routinely use in your practice? (Multiple responses)	
	(% represents percent of cases)
1. Preprocedural rinse	81 (52.3)
2. Rubber Dam	30 (19.4)
3. RT-PCR test before urgent/elective procedure	40 (25.8)
4. Medical History/ Consent form	113 (72.9)
5. High Volume Suction	56 (36.1)
6. Half an hour gap between each patient	37 (23.9)
7. Fogging after every patient	30 (19.4)
8. Ultrasonic chambers	22 (14.2)
9. Disposable covers for high contact surfaces	57 (36.8)
10. Use of Disinfectant for surfaces, water pipes and drains before and after the Procedure	77 (49.7)
11. Regular screening of employees for symptoms of disease	67 (43.2)

Table 4. Univariate analysis and logistic regression analysis for acceptance of COVID 19 vaccine among dental professionals

Category	Reference category	Crude odds ratio (95% CI)	Adjusted odds ratio (95% CI)	P value
Age				
20-40 years	> 40 years	4.83 (1.08-21.5)	0.19 (0.04-1.03)	0.054
Gender				
Female	Male	0.67 (0.28-1.61)	4.15 (1.38-12.45)	0.011*
Qualification				
Masters in dentistry	Bachelors in dentistry	0.16 (0.05-0.51)	8.15 (2.31-28.79)	0.001*
Getting antibody testing done before vaccination				
Yes	No	0.39 (0.05-3.17)	5.59 (0.58-53.73)	0.136
Getting vaccinated done only because of nature of the job				
Yes	No	0.81 (0.32-2.03)	1.35 (0.49-3.73)	0.567
Having concerns about any side effects in relation to vaccine				
Yes	No	0.75 (0.13-1.78)	1.11 (0.42-2.89)	0.836

The nosocomial transmission of the virus has been a concern for dental practitioners as it could put both patients and dental practitioners at higher risk of being infected [11]. The majority of the participants were just examining the routine OPD and only doing teleconsultations [12,13]. However, they did not consider remote consultation as an effective way of delivering dental services. Future studies must be conducted to hypothesize and design advanced technologies that can virtually deliver dental services only emergency treatment was being done. Teleconsultation seems to be attractive and flexible concept during such unpredictable times [14].

Most of the patients were themselves hesitant in getting the treatment done and only dental practitioners could convince them to get vaccinated as they themselves got the vaccination done therefore 77% of the dentists opted for getting themselves vaccinated first before telling their patients to get vaccinated.

Although restrictions and lockdowns have been erased in many countries. Dental practitioners are at high risk of SARS-COV-2 infection because they are exposed to saliva, blood and fluids during procedures. Moreover many dental surgeries can generate aerosol and the risk of air-borne infection is considered high [15].

Beyond a mere increase in personal protection, changes are needed in waiting room, patient screening and the form of providing care – in other words, the entire dental care process. The aim of such changes is the non-propagation of SARS-CoV2 and any other pathogens. Therefore, following existing protocols is extremely important during every dental appointment [16]. It is mandatory to follow regular screening of the patients followed by medical history of the patient, RT-PCR test to be done before doing any procedure should also be mandatory. At least half an hour gap between each appointment should be given. Disinfection of the clinical environment should be done and should begin from the least contaminated to the most contaminated area. Fogging after every patient followed by use of disinfectants for surfaces, water pipes and drains after the procedure should be done.

From this moment onwards dentists need to adapt their working hours, reorganise the office and hire a support team which not only changes the form of offering care but also has economic consequences [16,12].

5. CONCLUSION

Limitations of our research include that our investigation is within a single country and that broader occupations were not included. Further research can and should delineate whether physicians working in private clinics, which may have been ordered to shut down except for essential services, vs. physicians in hospitals which were not shuttered, have differences in COVID-19 vaccine acceptance rates. Additionally, the explanations for differing vaccine acceptance rates among even one class of professions, such as physicians or dentists, must be clarified.

CONSENT AND ETHICAL APPROVAL

Ethical approval was sought and received from PGIMER, ethics committee. All participants gave informed consent.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:

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